

Polycentric Governance: A Theoretical and Empirical Exploration

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By

Vlad Tarko
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Director: Peter J. Boettke, Professor
Department of Economics

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Fairfax, VA



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DEDICATION

This work is dedicated to Dragos Paul Aligica without whom I probably would have never pursued a PhD, let alone a PhD in economics. Thank you for your constant support, both as a mentor and a friend!

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ABSTRACT

POLYCENTRIC GOVERNANCE: A THEORETICAL AND EMPIRICAL EXPLORATION

Vlad Tarko, Ph.D.

George Mason University, 2015

Dissertation Director: Dr. Peter J. Boettke

The dissertation overviews and elaborates the concept of polycentricity, and applies it to two cases. Spontaneous order plays an important role in many non-market systems. But not all spontaneous orders are productive or sustainable. The concept of polycentricity aims to describe the productive subset of spontaneous orders, including both markets and non-market forms of organization. Broadly speaking, a polycentric system of governance is a collection of heterogeneous decision centers acting independently, but under a common system of rules and/or norms limiting negative externalities and free riding. The role of the overarching set of rules or norms is to assure that the spontaneous order is indeed productive and sustainable.

The first chapter (co-authored with Paul Aligica) starts by introducing the concept as it was advanced by Michael Polanyi and developed by Elinor and Vincent Ostrom. It continues introducing possible instances of polycentricity as well as related notions, as

part of an attempt to further elaborate the concept through a concept design approach that systematically applies the logic of necessary and sufficient conditions. The aim of this analysis is to identify which aspects are essential to the emergence of productive social orders. The chapter concludes by arguing that the polycentricity conceptual framework is not only a robust analytical structure for the study of complex social phenomena, but also a challenging method of drawing non-ad hoc analogies between different types of self-organizing complex social systems.

The second chapter applies the theory of polycentricity to the study of the scientific community. The success of the scientific community challenges in many ways our theories of social cooperation and public goods production. It is a very large scale, decentralized, international organization lacking any central management or a formalized legislative or rule-enforcement body. Even the entry/exclusion rules are lax and unclear. By many standards it should not work. But instead it is one of the most successful human endeavors of all time. This chapter provides an updated institutionalist theory of how this community works, with an extended discussion of its informal norms, prestige mechanisms, decentralized resource allocation, and interactions with states and civil society. Second, the chapter discusses the ways in which the scientific community can fail at its truth-seeking task as a result of distortions created by outside political pressure and interactions with self-interested funding sources, arguing that, as long as the polycentric structure is kept in place and the informal norms are preserved, the distortions are likely to be minor.

The third chapter (co-authored with Paul Aligica) presents a new method of stakeholder analysis based on the theory of polycentricity and co-production. We use these theories to model the interactions between different stakeholders of a corporation and the corporate management, providing a new perspective on the broad business case for corporate social responsibility (CSR). The Polycentric Stakeholder Analysis (PSA) framework accommodates stakeholders' heterogeneity of preferences, beliefs and values, and the complex nestedness of stakeholders' governance systems; it is realistic in capturing the imperfect rationality, limited information and potentially opportunistic behavior, while also preserving the key elements of the normative democratic ethos that drives CSR more broadly. We show how CSR managers can determine who the salient stakeholders are, without adopting unrealistic homogenizing assumptions about "hypernorms" or "integrative social contracts", and we provide a simple public economics model, inspired by the calculus of consent, showing how to allocate CSR resources efficiently.

CHAPTER 1: POLYCENTRICITY: FROM POLANYI TO OSTROM, AND BEYOND*

Introduction

The concept of polycentricity (tentatively defined as a social system of many decision centers having limited and autonomous prerogatives and operating under an overarching set of rules) was first envisaged by Michael Polanyi in his book *The Logic of Liberty* (1951). From there it diffused to law studies, thanks to Lon Fuller (1978) and others (Chayes, 1976; Horowitz, 1977), to urban networks studies (Davoudi, 2002; Hague & Kirk, 2003), and, even more importantly, to governance studies, thanks to Vincent and Elinor Ostrom and the Bloomington School of institutional analysis (Aligica & Boettke, 2009). The 2009 Nobel Prize in economics awarded to Elinor Ostrom pushed this concept to a renewed attention. Indeed, the notion of polycentricity has a pivotal role in the Bloomington School of institutional analysis. Yet, although the concept is often recognized as important, not much has been done to further clarify and elaborate it, beyond the work of the aforementioned authors. This chapter is an attempt to deal with this challenge.

* Co-authored with Paul Dragos Aligica

1 Initial developments

Michael Polanyi's original development of the concept of polycentricity was the outcome of his interest in the social conditions preserving the freedom of expression and the rule of law (Prosch, 1986: 178). His approach was highly original in that he based his social analysis on an analogy to the organization of the scientific community. This was facilitated by his anti-positivist approach to the philosophy of science, as he considered the success of science to be the outcome of a certain kind of social organization, rather than of scientists following a rigidly defined "scientific method" (Polanyi, 1951).

Polanyi argued that the success of science was mainly due to its "polycentric organization". In such organizational systems, participants enjoy the freedom to make individual and personal contributions, and to structure their research activities in the best way they considered fit. Researchers' efforts don't usually dissipate in unproductive directions because they share a common ideal, i.e. their freedom is utilized to search for an abstract end goal (objective truth). Polanyi's key point is that such an abstract and under-operationalized ideal cannot be imposed on the participants by an overarching authority. Thus, the authority structure has to allow a multitude of opinions to exist, and to allow them not just as hypotheticals, but as ideas actually implemented into practice. The attempt to impose progress towards an abstract ideal is doomed to failure, as progress is the outcome of a trial-and-error evolutionary process of many agents interacting freely. Polanyi argued that the same applies to art, religion or the law as it

applies to science, because these other activities are also polycentric in nature and driven by certain ideals (beauty, transcendent truth, and justice).

Polanyi did not stop at these observations. He used the concept of polycentricity as a particularly well suited tool for addressing the well-known socialist calculation problem (Mises, 1922; Lange, 1938; Hoff, 1981). His arguments about the impossibility of economic calculation in a socialist system were closely related to Hayek's, yet they also benefited from the more general perspective provided by the concept of polycentricity. The market, he wrote, should be seen as a polycentric system involving a web of many agents that constantly adjust their behavior to the decisions made by others. Socialism implies the transformation of the system into a monocentric one. To make his point, Polanyi drives an analogy between scientists trying to discover the truth and entrepreneurs trying to discover the best way to make profit. In some sense, the market can also be said to have an ideal, namely to deliver the optimal distribution of goods and the optimal production processes (i.e. to reach a Pareto equilibrium), and real markets always fall short of this ideal as agents lack perfect information and human activities often involve externalities.

The socialist system is an attempt to reach at (Pareto) economic optimum states faster and better than the market by means of a command-and-control strategy. That is supposed to reduce the misallocation of resources, something supposedly inherent and unavoidable in a polycentric market system. In other words, centralized socialism was expected to work better than the free market and to deliver faster economic growth. However, the Pareto

equilibrium ideal is not exactly easy to operationalize. First of all, preferences are subjective and thus the information about the demand of any good or service cannot be guessed from an outside vantage point. It is only revealed by the actual behavior of agents. Secondly, the amount of information required to manage all the production processes is enormous and cannot possibly be gathered and analyzed in a centralized fashion.

Consequently, in a monocentric-socialist system, the economic ideal can neither be derived nor imposed by central authorities. The system has to be allowed to move towards the “optimum” (ideal) in a trial-and-error fashion. In the same way as scientific progress cannot be guided by an authority (or by some rigid method), economic growth cannot be delivered using a command-and-control strategy.

[S]elf-coordination of independent initiatives leads to a joint result which is unpremeditated by any of those who bring it about. Their coordination is guided as by an “invisible hand” towards the joint discovery of a hidden system of things. Since its end-result is unknown, this kind of co-operation can only advance stepwise, and the total performance will be the best possible if each consecutive step is decided upon by the person most competent to do so. ... Any attempt to organize the group ... under a single authority would eliminate their independent initiatives and thus reduce their joint effectiveness to that of the single person directing them from the centre. It would, in effect, paralyze their cooperation. (Polanyi, 1951)

This argument is obviously related to Hayek’s, but Polanyi parted ways with Hayek in regard to one important aspect, namely the issue of social justice. The difference is important for our current understanding of polycentricism. While Hayek (1976) argued that the concept of social justice is literally meaningless, Polanyi was concerned that the market system comes into conflict with certain religious or secular moral values and that

it may actually generate incentives undermining moral behavior (Polanyi & Prosch, 1975). This way of reframing the issue of market-and-morality by reference to individual behavior avoids the types of collectivist arguments that Hayek tried to debunk, while keeping the issue of morality on the table.

Nonetheless, Polanyi's epistemic brand of moral relativism also meant that he believed that any attempt to impose morality by a central authority was not likely to succeed. Moreover, as a side-effect of centralized enforcement, such attempts would only diminish freedom. In this regard, Polanyi argued that socialism was in fact not so much an economic theory, but a moral system and the claims to scientific status were merely a rhetorical device meant to facilitate the spread of the system. As such, to the economic critique of socialism, Polanyi added the argument of moral relativism, i.e. the idea that justice itself is an ideal one can only hope to approach by means of a gradual trial-and-error process. This idea, and Polanyi's concept of polycentricity in general, proved to be a source of inspiration in legal studies.

Lon Fuller (1978) remarked that many problems that judges are called to settle are polycentric in the sense that disputes often involve many decision centers and the network of cause and effect relationships is not understood very well. This makes any decision not only more difficult but also a source of unintended consequences. Therefore, attaining justice can be quite a remote ideal. Fuller argues that, when problems appear in polycentric systems, many of the affected parties are often not called to express their point of view in court.

Many unrepresented parties are affected by the most conventional forms of litigation. Significant losses under a contract can close businesses. A criminal conviction can wreak havoc on an entire town. A finding of negligence, products liability or fraud can bankrupt a business and send shock waves throughout a large network of contracts. Likewise, a contractual dispute concerning the management of a city's water and sewage system could affect millions of people, without the justifiability of any issue being called into question. Constitutional law questions, human rights, and statutory interpretation routinely involve settling legal questions with incalculable implications for unrepresented parties. Furthermore, the fact that judicial decisions affect the rights of parties not before the court is not only a collateral effect, but a fundamental responsibility of the courts. They are to clarify the applicable law for all to follow. (King, 2006)

Given this existing complexity, Fuller asked the following question: Which issues should be settled in court, which should be settled by political means, and which should be left to the market? As a general rule of thumb, Fuller argued that when there are many parties affected by an issue, the probability of judicial error increases due to the impossibility of avoiding generating unintended consequences. As such, there should be a threshold defined by the level of polycentricity in a system, beyond which courts should not rule, but leave the matter instead either to markets or to the political process. Polycentric non-judicial processes could offer better solutions. In other words, Fuller makes out of the notion of polycentricity a key element (i.e. an operational criterion) in his system of justice. Both Polanyi and Fuller's approaches highlighted the contours and relevance of the concept. However, it was the work of Vincent and Elinor Ostrom that operationalized it and gave it empirical substance.

2 The Ostroms and the polycentric perspective in institutional theory

The Ostroms became interested in the concept in the sixties in the midst of a heated debate on the nature and objectives of the public administration reform in American metropolitan areas. However, their work transcended the “metropolitan governance” debate and evolved in two directions: The first was foundational – a social theory or social philosophy of social order built around the concept of polycentricism. The second was empirical and applied, focusing on a variety of case studies that acquired new relevance once seen through the lenses of a polycentric paradigm.

2.1 Political economy, polycentricity and the metropolitan reform debate

The conventional wisdom in the sixties was that a metropolitan region should be one large community, functionally integrated by economic and social relationships. However, its functional unity was artificially divided administratively by ad hoc, governmental units. A metropolitan region had no unitary administrative identity. Instead, there were many federal and state governmental agencies, counties, cities, and special districts each with its separate jurisdiction, overlapping and subverting each other. The result, argued the mainstream, was making efficient administration impossible because the disparate units were acting autarchic and were thus unable to perform the functions they were meant to perform. Without an overarching coordination center, each unit of local government acted in its own interest, without regard for the public interest of the metropolitan community (E. Ostrom [1972] in McGinnis, 1999; Institute for Local Self-Government, 1970). Out of this diagnostic grew an entire literature converging around the idea that the “problem of metropolitan government” was that “the multiplicity of

political units” made governance in metropolitan areas “a pathological phenomenon”. There were “too many governments and not enough government” and as a result, a “duplication of functions”, a confusing “overlapping jurisdictions” and an “organized chaos.” These arguments were relatively similar to the socialist arguments about the supposed economic superiority of central-planning over free markets.

Vincent and Elinor Ostrom and their associates responded by challenging one of the basic theoretical tenets of the “reformers”. [For an extended discussion, see Aligica and Boettke (2009) – on which this section is based.] Quoting political economist after political economist, they hammered the crucial fact that the optimum scale of production is not the same for all urban public goods and services. Some services may be produced “more efficiently on a large scale while other services may be produced more efficiently on a small scale” (E. Ostrom [1972] in McGinnis 1999; Oakerson, 1999; Ostrom, Bish & Ostrom, 1988). Therefore, the existence of multiple agencies interacting and overlapping, far from being a pathological situation, “may be in fact a natural and healthy one”. This overlapping and duplication is the result of the fact that different services require a different scale for efficient provision and that principles of division of labor, cooperation and exchange function in the public sector, too.

Duplication of functions is assumed to be wasteful and inefficient. Presumably efficiency can be increased by eliminating “duplication of services” and “overlapping jurisdictions.” Yet we know that efficiency can be realized in a market economy only if multiple firms serve the same market. Overlapping service areas and duplicate facilities are necessary conditions for the maintenance of competition in a market economy. Can we expect similar forces to operate in a public economy? (Ostrom and Ostrom, 1965, 135-36)

The Ostroms explained that the variety of relationships between governmental units, public agencies, and private businesses coexisting and functioning in a public economy “can be coordinated through patterns of interorganizational arrangements”.

Interorganizational arrangements, in that case, would manifest market-like characteristics and display both efficiency-inducing and error-correcting behavior. Coordination in the public sector need not, in those circumstances, rely exclusively upon bureaucratic command structures controlled by chief executives. Instead, the structure of interorganizational arrangements may create important economic opportunities and evoke self-regulating tendencies. (Ostrom and Ostrom, 1965, 135-36)

The insights brought by applying the standard political economy perspective were remarkable and instructive, yet, they were not considered as sufficient. The political economy conceptual framework needed special adjustments in order to get adapted to a phenomenon that was, in the end, quite different from the standard market-based phenomena. Some of the concepts and insights derived from the private economy could find a direct application. Others needed further adjustments. But one idea was clear: The political economy approach did not assume a priori that competition among public agencies is necessarily inefficient (V. Ostrom, Tiebout & Warren, 1961; Bish, 1971; Wagner & Warren, 1975).

In order to move the argument further and avoid sterile debates, it was not enough to note the differences between the two approaches to metropolitan governance (metropolitan reform vs. political economy) and to suggest that one is better. A mere comparative assessment of the most salient elements of the two theories was inconclusive:

With basic differences in theoretical perspectives, scholars will adopt quite different

orientations to their subject matter, will use different concepts and languages, and will pursue their inquiries in quite different ways. These differences will not be resolved by discussion and deliberation alone. Instead, ... we can attempt to undertake critical tests where divergent theories imply contradictory conclusions. The theory that has the weaker explanatory capability presumably would give way in the course of time.

And thus, the parameters of an empirically grounded debate were set up for the first time.

Once stripped from their ideological and theoretical mantle and formulated in empirical form, the claims implicit in the metropolitan reform literature became very plain.

Empirical analysis was possible. The analysis was possible by pairing up propositions such as: (1.a.) “Urban public goods and services are relatively homogeneous and similarly affect all neighborhoods within a metropolitan area” vs. (1.b.) “Urban public goods and services differ substantially in regard to their production functions and their scale of effects”. Or, (2.a.) “Urban voters share relatively similar preferences for urban goods and services” vs. (2.b.) “Individuals with relatively similar preferences for public goods and services tend to cluster in neighborhoods; preferences will tend to be more homogeneous within neighborhoods than across an entire metropolitan area”. The objective was to match the two parallel sets of propositions and to make the empiric inter-comparisons as substantive as possible (E. Ostrom [1972] in McGinnis 1999, 148).

To explore the issue, a very concrete empirical agenda was put together by Elinor and Vincent Ostrom and their team. For instance, one key theme of the metropolitan debate was focused on how the size of the governmental unit affects the output and efficiency of service provision – i.e. the impact of the size of a government producing a service.

Ostroms’ team decided that, instead of speculating, to simply get out in the field and try

to collect the data needed to measure the relationship. It was an attempt first to test the opposed theories of urban governance focused on the size of governmental units and second to focus on the number of such units in a metropolitan area.

The studies on police services are in that respect exemplary. Studies started in Indianapolis, with a comparative analysis of independent, small police departments that were serving neighborhoods next to very similar to the neighborhoods served by the larger Indianapolis City Police Department. They extended the study to the Chicago Police Department, the St. Louis metropolitan and then developed replications in Grand Rapids, Michigan, in the Nashville-Davidson County area of Tennessee and again in Indianapolis. They also tested for external validity, using a large survey of citizens living in 109 cities with populations of more than 10,000. The study challenged the notion that presumed that larger urban governments would always produce superior public services: “The presumption that economies of scale were prevalent was wrong; the presumption that you needed a single police department was wrong; and the presumption that individual departments wouldn’t be smart enough to work out ways of coordinating is wrong,” Ostrom says. On the whole, “polycentric arrangements with small, medium, and large departmental systems generally outperformed cities that had only one or two large departments” (E. Ostrom [1972] in McGinnis 1999, 148; Ostrom and Parks 1973a, 1973b; Ostrom, Parks and Whitaker 1973, 1978).

Out of this effort grew a solid empirical research agenda, an entire new domain out of which the outstanding work on commons and common pool resources was later to emerge, as well as the applied institutional analysis tools for which the Ostroms' Bloomington school is well known today. However, the inquiry into the two models of metropolitan governance analysis and their implicit policy recommendations revealed that the differences between the two were not merely theoretical and methodological (political economy vs. traditional public administration theory; individualism vs. holism). A deeper and more profound difference of vision was revealed. A paradigmatic pair of correlate concepts seemed to define those visions. Understanding the nature and implications of the differences between the two seemed crucial for the fate of the debate. The two concepts were: "polycentricism" and "monocentrism". Developing them was not just a "normal science" task – replicating or applying an existing model or concept to an additional domain. Instead, it was an effort to change the paradigm. A new domain was to be defined and that required an entire new conceptual framework.

By conceptualizing metropolitan areas as polycentric political systems, we were suggesting that a system of ordered relationships underlies the fragmentation of authority and overlapping jurisdictions that had frequently been identified as "chaotic" and as the principal source of institutional failure in the government of metropolitan areas. We identified a polycentric political system as having many centers of decision making that were formally independent of each other. A "system" was viewed as a set of ordered relationships that persists through time (V. Ostrom [1972] in McGinnis 1999, 53).

Of special importance is the fact that the two notions defining the conceptual space are interlinked. Studying policentricity is also a study of monocentricity. The relation is not only logical – the two being correlated concepts – but also empirical. "A predominantly

monocentric political system need not preclude the possibility that elements of polycentricity may exist in the organization of such a system”. Conversely, “the existence of a predominantly polycentric political system need not preclude elements of monocentricity from existing in such a system” (V. Ostrom [1972] in McGinnis 1999, 52).

It was clear that reformers and the mainstream political scientists were going in different directions as they saw the fragmentation of authority and overlapping jurisdictions as generating something described as “chaotic.” Elucidating the problem of polycentricity and chaos (defined as lack of order or perceived lack of order) was thus central in the effort of defining the tasks and advancing the agenda. The real stake was to identify and chart the patterns of order looming underneath the apparent chaos intrinsically associated to the experience of polycentricity:

For a polycentric political system to exist and persist through time, a structure of ordered relationships would have to prevail, perhaps, under an illusion of chaos. If such a structure of ordered relationships exists one might assume that specifiable structural conditions will evoke predictable patterns of conduct. Only if predictable patterns of ordered relationships could be established would it be possible to evaluate the performance of a polycentric system and anticipate its future performance as against some other structure of ordered relationships. The development of an explanatory theory must precede the evaluation of alternative patterns of organization in relation to normative criteria (V. Ostrom [1972] in McGinnis 1999, 53).

But if that was the case, at stake was nothing less than a theory of hidden order, a theory of the “invisible hand” directing the “social mechanism”, a theory applicable to many instances of social order. Polycentricity, as intuitively foreseen by Michael Polanyi, was indeed applicable to a large range of social phenomena. That is to say that a discussion of

polycentrism in political-administrative systems was one way, out of many possible ways, to approach the issue via an empirical example. If polycentric systems of government in metropolitan areas are just one case of polycentricism, if metropolitan areas were just one instance of polycentric order, then that specific case could be used as a vehicle for building a working definition or a general description of the phenomenon in point. That is to say that polycentricity raises fundamental challenges to political theory that have broader ramifications that go beyond the issue of the governance of metropolitan areas.

2.2 Specifying the concept: The Ostrom perspective

In specifying the concept it is no surprise that the issue of monopoly of power is a major element. One of the key features in defining a polycentric – or for that matter, a monocentric – order is the issue of the monopoly over the legitimate exercise of coercive capabilities. A monocentric political system is one where the prerogatives for determining, and enforcing the rules are “vested in a single decision structure that has an ultimate monopoly over the legitimate exercise of coercive capabilities”. On the other hand, a polycentric political system is one where “many officials and decision structures are assigned limited and relatively autonomous prerogatives to determine, enforce and alter legal relationships” (V. Ostrom [1972] in McGinnis 1999, 55-56). In a polycentric political system no one has an ultimate monopoly over the legitimate use of force and the “rulers” are constrained and limited under a “rule of law”.

Thus, ultimately, polycentric systems are rule of law systems. That is the reason why in defining a polycentric system the notion of “rule” is as important as the notions of “legitimacy”, “power” or multiplicity of “decision centers” are. Ostrom, Tiebout, and Warren (1961) considered it the real functional principle behind polycentricity. The multiplicity of decision centers was a meaningful way of defining polycentricity only under the rule of law. There are many forms of organization that might seem analogous to a polycentric order. However not all of them had the attributes associated to polycentricity as long as they were lacking an encompassing system of rules.

While starting to understand the meaning and conditions of polycentricity, V. Ostrom and his associates realized that the study of polycentricity (and, even more precisely, the problem of whether the government of a political system can be organized in a polycentric manner) had a considerable history. There was no historical accident that Alexis de Tocqueville made his observations about the invisible mechanisms of social order while studying the democracy in America. According to V. Ostrom, designing the American constitution could be viewed as an experiment in polycentricity while federalism could be seen as one way to capture the meaning and to operationalize one aspect of this type of order. And, in the light of that insight, polycentricity seems to be a necessary condition for achieving “political objectives” such as liberty and justice. The dispersion of decision-making capabilities associated to polycentricity, wrote Ostrom, “allows for substantial discretion or freedom to individuals and for effective and regular

constraint upon the actions of governmental officials” and as such is an essential characteristic of democratic societies.

The historical and normative note is important. It suggests that if one is interested in the conditions preserving and enhancing the aforementioned “political objectives” one needs to better understand what makes polycentric systems so special. The conclusion was that a polycentric arrangement has a built-in mechanism of self correction. Self-correction is the crucial functional or operational feature of polycentricity that explains in good measure an important part of its performance.

While all institutions are subject to takeover by opportunistic individuals and to the potential for perverse dynamics, a political system that has multiple centers of power at differing scales provides more opportunity for citizens and their officials to innovate and to intervene so as to correct maldistributions of authority and outcomes. Thus, polycentric systems are more likely than monocentric systems to provide incentives leading to self-organized, self-corrective institutional change (E. Ostrom, 1998).

The study of the US constitutional experiment as an experiment in polycentricity leads to other interesting insights. For instance: if polycentric systems depend on the value and culture of the individuals creating them, then whether or not a significant number of individuals share or aspire to those values is critical for the operation of the system. And thus, Ostroms’ exploration lead to the conclusion that the discussion on polycentricity is not just a discussion about multiple decision making centers and monopolies of power but also a discussion about rules, constitutions, fundamental political values and cultural adaptability in maintaining them.

Any discussion of polycentricity had sooner or later to deal with the issue of spontaneity or spontaneous order. Polanyi's use of the term spontaneous as synonymous with polycentric implied that the attribute of spontaneity is in a deeper sense an additional defining characteristic of polycentricity (or at least theoretically related to it). In his attempt to put forward a coherent concept of polycentricity, Vincent Ostrom ([1972] in McGinnis, 1999, 60) embarked in an effort to elaborate Polanyi's point: Spontaneity means that "patterns of organization within a polycentric system will be self-generating or self-organizing" in the sense that "individuals acting at all levels will have the incentives to create or institute appropriate patterns of ordered relationships". That is to say that, in a polycentric system, the "spontaneity" is a function of self-organizing tendencies occurring, under specific conditions, at several different levels. Outlining these conditions is a step further in specifying the concept of polycentricity as seen through the Ostrom perspective.

The first condition is the freedom of entry and exit in a particular system. If the establishment of new decision centers under the existing rules is blocked, then one could not expect a polycentric order to emerge. The freedom of entry ensures the spontaneous development of the system. (V. Ostrom [1972] in McGinnis 1999, 60). The second condition is related to the enforcement of general rules of conduct that provide the legal framework for a polycentric order. "If individuals or units operating in a polycentric order have incentives to take actions to enforce general rules of conduct, then polycentricity will become an increasingly viable form of organization" (V. Ostrom

[1972] in McGinnis 1999, 60). Finally the third condition is that spontaneity should be manifested is the reformulation and revision of the basic rules that define the framework of a specific polycentric order. The idea is that individuals should be free not only to play the game or have the incentives to self-enforce the rules of the game but also to change those rules in an orderly way.

In this respect there are two prerequisites. One is procedural. There should be rules on changing rules. The other is cognitive: an understanding of the relationship between particular rules and the consequences of those rules under given conditions. “If conditions were to change and a particular set of rules failed to evoke an appropriate set of responses, rules could then be altered to evoke appropriate responses” (V. Ostrom [1972] in McGinnis 1999, 60). This has an important implication for the very way the relationship between spontaneous order and design is understood. Understanding and learning from experience are in fact the vectors of an ongoing process of knowledge integration in the institutional system and the prerequisites of subsequent adaptations to the changing environment. Institutional design, the application of our understanding of rules and consequences and the conditions that determine their interplay, is part and parcel of spontaneous order and not inimical to it. That is to say that design and spontaneous order are not irreconcilable. The link between the two is given by the notion of knowledge and its correlate concepts such as learning (V. Ostrom [1972] in McGinnis 1999, 60).

Finally, one should note that one of Ostrom's most interesting conjectures was that the structure and dynamics of a polycentric system is a function of the presence of polycentrism in the governance of the other related and adjoined systems. The basic social functions or institutional arenas of a society could be organized in various degrees under a polycentric order: polycentricity in the structure of governmental arrangements, polycentricity in economic affairs, polycentricity in political processes and the formation of political coalitions, polycentricity in judicial affairs, polycentricity in constitutional rule (V. Ostrom [1972] in McGinnis 1999, 56). The relationship between these domains is extremely important.

Ostrom thought that examples and cases of polycentric order (in economy, law, and politics) show that a polycentric order means more than just a matter of different centers of decision operating in competition with each other in a specific domain or area. Polycentricity is a complex system of powers, incentives, rules, values and individual attitudes combined in a complex system of relationships at different levels. Even more important, one may detect a very interesting dynamics at work. Market polycentricism seems to entail judicial polycentricism, judicial polycentricism to entail political polycentricism, and political polycentricism to entail constitutional polycentricism. If one accepts the hypothesis of the existence of such a systemic logic, one may visualize the entire social system shaped by underlying currents originating in pulsating polycentric domains. Any island of polycentric order entails and presses for polycentricism in other areas, creating a tension towards change in its direction.

However, at the same time, one can imagine monocentricity operating under a similar dynamics. The result of the ongoing tension between the two principles is an unstable coexistence. One area or domain opened to polycentricity strives for polycentricity in another area, one area or domain under monocentricity strives for monocentricity in other domains. To capture, conceptualize and analyze the entire dynamics of the field of tensions and friction between monocentrism and polycentricity, becomes an important challenge. If that is the case, then it should be no surprise that finding or building the proper conceptual apparatus for this task was declared to be in fact the priority task of an approach to social order from the perspective of polycentricity scholarship. As V. Ostrom put it:

Penetrating an illusion of chaos and discerning regularities that appear to be created by an "invisible hand" imply that the tasks of scholarship (...) will be presented with serious difficulties. Relevant events may occur without the appropriate proper names being attached to them. Presumably events implicated by definitions used in scholarship may deviate from conventions that apply to the use of proper names. Patterns and regularities which occur under an illusion of chaos may involve an order of complexity that is counterintuitive (V. Ostrom 1972, 20).

Vincent Ostrom argued that the fact that the concept of polycentricity was polar and correlated to that of monocentricity and the fact that the monocentric vision dominated political sciences for such an extended time had left their mark. Not only that a proper language and concepts needed to map, to describe and analyze polycentric systems were lacking but even worse, the existent language in political science was deeply contaminated by the monocentric vision. Perceiving polycentricity through the lenses

shaped by a monocentric vision and describing it using the vocabulary growing out of that vision was doomed to be deeply distorting and misleading. That meant that the existent conceptual frameworks and their associated vocabulary needed to be tested, refocused and reconfigured in way that would make their limits and preconceptions explicit.

At the same time, the Ostroms were aware that all conceptual development wouldn't have led too far without full-blown expansion of the empirical agenda. Hence a tension and a trade-off. The final result was that the much needed elaboration and development of the conceptual framework had to be somewhat stalled. And thus, although the point at which the concept was brought had a very important potential, that potential is yet to be explored. "Polycentricity", as developed by the Bloomington researchers, is not anymore a mere mixture of intuitions and functionalist descriptions. Ostroms' work offers us today a clearly articulated building block or reference point for further developments. The rest of this chapter will take as a starting point the notion as developed by them and will try to make several steps further in exploring the conceptual space of polycentricity.

3 Related concepts and further elaborations

Before engaging in any attempt to elaborate the concept of polycentricity, it is useful to revisit a set of examples that may be used to illustrate the notion. While we look at some of those examples we also need to look at some references that, although don't use the term "polycentricity", do illuminate or emphasize phenomena akin to polycentricity.

Any list of real-world examples of polycentricity (other than municipal governments) used at one point or another either to directly exemplify the concept or that could be used to illuminate it, cannot circumvent the following: science (Polanyi, 1951; Feyerabend, 1975), representative constitutional democracy (V. Ostrom, 1972), free market (Polanyi, 1951), common law (Hayek, 1973; Fuller, 1978; King, 2006). The diversity is evident. For instance, in some cases the decision centers are non-territorial (they have overlapping jurisdiction), in some cases they are territorially delimited, and some cases can be in both ways. Hence the underlying crucial question: Do indeed all those phenomena share something? Would that common element really be something called “polycentricity”? Or maybe we are talking about a series of overlapping “family resemblances”? One way or another, even a mere list of phenomena that are suspected of polycentrism, in some degree or another, makes for a challenging research agenda.

To the list of “suspected of polycentricity” phenomena we should also add examples of notions that are related, in the sense that they point out to processes and phenomena related to polycentrism as defined in the Polanyi-Ostrom tradition. These are notions that, once defined and elaborated, display many features that are associated to polycentricity (but also some significant differences): polyarchy (Dahl, 1971), multiplism (Lindblom & Woodhouse, 1993), market-preserving federalism (Weingast, 1995), federation of liberty (Kukathas, 2009).

A final element of the list of phenomena and related notions that are or could be associated to the themes of polycentricity and which deserves a special note is anarchy as

a social phenomenon (Tullock, 1972; Stringham, 2005; Powell & Stringham, 2009). This special attention is due to the fact that there is a huge potential of confusion between the two. The most well-known literature on anarchism (from Godwin to Rothbard) is *normative*. These normative theories have been accused of being impossible to put into practice (Nozick, 1974; Buchanan, 1975). The field of *positive* anarchy (as opposed to the normative strand) emerged with the goal of testing scientifically the validity of Nozick-Buchanan-like intuitions and, consequently, gauge the general importance of institutional enforcement for the creation and maintenance of social order in large groups of quasi-strangers, as opposed to the culturally mediated spontaneous order (Boettke, 2005).

The preliminary conclusions of such “positive anarchy studies”, especially the empiric ones, are three fold. Firstly, in the same way as there are many varieties of states, there are also many varieties of possible anarchic systems, based on different rules and modes of enforcement of those rules, and these varieties are widely divergent in terms of peacefulness and security. Secondly, there are cases in which Hobbes-Buchanan’s pessimism about peaceful anarchy is unjustified as the emergent social order is preserved in the absence of a monopoly of force or even, in certain cases, *despite* the existence of a monopoly of force acting contrary to the preservation of peace and failing to promote prosperity. Thirdly, not all anarchic organizations are peaceful and promote prosperity; in certain cases Hobbes-Buchanan’s intuition proves entirely correct.

Positive anarchy studies overlap to a certain extent with the literature on polycentricity, as anarchism involves by definition multiple centers of decision making. The connection

between the two fields has two aspects. On one hand, one can see some of the positive anarchy studies as studies of the dangers of polycentricity, of how the existence of multiple centers of decision making can degenerate into social chaos. Although anarchy presupposes multiple centers of decision making, not all anarchic systems are instances of polycentricity. It is important to hold in mind that polycentricity involves the existence of multiple centers of decision making *within an accepted set of rules*. In other words, only peaceful variants of anarchy are instances of polycentricity as these variants are peaceful precisely because rules exist and function (albeit in the absence of a single enforcer having the monopoly of force). In turn, the concept of polycentricity provides the theoretical branch of positive anarchy studies a comprehensive way of modeling the boundary between peaceful anarchy (i.e. polycentricity) and chaotic and violent anarchy.

On the other hand, one can see positive anarchy studies as studies of the most fundamental aspects of polycentricity, namely of how emergent social order originally arises out of the interactions of individuals. While one can of course study polycentric systems that are already strongly embedded in a system of rules, one's analysis is not really pushed to its natural end unless it is understood how and why these systems of rules came about. Moreover, and most importantly, such understanding is not just of historic interest. In the same way as in biology ontogenesis is not just the process by which an adult living being develops from a single cell, but also the day-by-day process at cellular level by means of which the living beings maintains its structural integrity in time by being constantly rebuilt, positive anarchy studies describe a form of social

ontogenesis – the historic process by which the complex social order of contemporary societies developed is also an ongoing, pervasive process responsible for the day-by-day functioning of those complex social orders. These original social forces are still present and they constitute the raw material out of which the complex social order is built and which are merely constrained and modeled by modern culture and institutions. As such, positive anarchy studies provide important data for understanding contemporary social phenomena.

All of the above allows us to get a somewhat better understanding of polycentricity. Polycentricity emerges as a non-hierarchical institutional and cultural framework that makes possible the coexistence of multiple centers of decision making with different objectives and values, and which sets up the stage for an evolutionary competition between the complementary ideas and methods of those different decision centers. The multiple centers of decision making may act either all on the same territory or may be territorially delimited from each other in a mutually agreed fashion. Based on the above overview, we are now in a position to restate an important point. Implied in the effort to untangle and elaborate the concept of polycentricity is the crucial assumption and expectation that it provides a unified conceptual framework for analyzing and comparing different “spontaneous order” phenomena, i.e. for understanding different forms of social self-organization as special cases of a more general unique evolutionary phenomenon. This phenomenon is manifesting in social groups and networks made up of very different kinds of actors (from scientists to entrepreneurs to politicians to judges to urban planners

to military leaders) and relative to very different kinds of overarching end goals (such as truth-seeking, maximizing economic profits, gaining and maintaining political power, seeking justice or maintaining social order). Understanding these social phenomena as special cases of polycentricity may make it easier to draw informed analogies from one field to another.

Moreover, it may be the case that, as the Ostrom conjecture suggests, in the real world many of these different cases of polycentricity are not independent of each other but in constant interaction. As such, the concept of polycentricity may provide a better foundation for understanding the interactions between, say, economic order and democratic order, and for analyzing possible social changes (such as the possible transition from a market-based democracy to a centrally-planned dictatorship, the well-known Hayek's "road to serfdom" conjecture). Thus, Polanyi and Ostroms' original goal in defining the concept – the facilitation of useful and productive analogies among various cases of spontaneous order phenomena – could be further extended. In the end, whether or not all or only some of the above examples, and others like them, will be accepted as instances of polycentricity, depends in large measure on (a) whether the polycentric conceptual framework provides useful insights about their functioning and, conversely, (b) whether they in turn provide useful insights into the other already accepted cases of polycentric phenomena. The bottom line is that, at this point, the literature has not yet reached a sufficiently robust and rigorous level of analytical development for such questions to be constructively addressed. This is the context in

which one should consider the subsequently goal of the present chapter, i.e. to move us closer toward an analytical development of the concept able to serve such investigations.

4 Polycentricity: conceptual structure and boundaries

The brief overview of potential examples of polycentrism, as well as of related notions, leaves us in the position to ask again whether and how it is possible to identify a core common element. At the end of the preceding section we have outlined a basic conceptualization of polycentricity as it emerges from the assumption that the provided examples do indeed share a set of common features. We now wish to push the matter further. Although a variety of possible directions of development are possible, we'll use the direction outlined by the Ostromian perspective.

The fundamental dilemma in concept design regards the issue of whether one is dealing with such “core elements” or with “family resemblances” or, for that matter, with neither. In most cases involving complex notions, such as those used to deal with in social science problems, it is difficult to define a concept in the traditional Aristotelian genus–differentia fashion. On the other hand, Wittgenstein’s “family resemblance” approach (1953), based on the idea that various empiric instances of a given concept may not all share a set of fundamental “essential” properties, offers no intrinsic criterion for establishing a concept’s border, a criterion for keeping the concept from becoming utterly vague. This is the point when the solutions offered by Gerring (2001) and Goertz’s (2005) become important. First of all, they provide a more formalized approach to the issue of family resemblances allowing researchers to map exactly how various instances

of a concept morph from one to another as certain attributes change. Secondly, Gerring (2001) provided several pragmatic criteria for establishing the legitimate boundaries of a concept: resonance and relevance, parsimony, coherence and boundedness, commensurability, and operationalization.

In his work, Goertz's (2005) develops a simple, yet powerful, framework for stirring the analysis from the more or less vague and difficult to measure attributes toward the more clear-cut indicators. A concept is defined by means of its attributes (basic features) and those attributes are further explicated by means of more detailed empiric indicators.

Goertz thus proposes a three-level framework for concepts (p. 50-3). At the first level there is the *concept* we are trying to define, in our case "polycentricity". The second level contains the *attributes* in terms of which we are defining the concept. In our case, these are the basic features of polycentricity outlined by the definition of the preceding section, features emphasized by the Bloomington school approach, namely (1) the existence of many centers for decision making, (2) the existence of a single system of rules (be they institutionally or culturally enforced), and (3) the existence of a spontaneous social order as the outcome of an evolutionary competition between different ideas, methods and ways of life. The third level contains *indicators* with the help of which we make the definition more operational and empirically powerful. The possible values of those indicators are incorporated in a general logical formula involving both conjunctions and disjunctions. (The traditional Aristotelian approach allows only the conjunction of

attributes/indicators, hence its limitation.) This logical formula opens the path to an analytic, rigorous definition of the concept.

We may now make a real step further and try to determine the logical structure of polycentricity in terms of deeper level indicators, rather than just in terms of the three basic attributes. The main output of this logical analysis is the capability to map the conceptual space of the different kinds of possible (hypothetical or real) polycentric systems. In order to accomplish this, we need to perform an initial analysis of the candidate cases for polycentricity, based on the conceptual guidelines emerging in the previous discussion. The following set of features summarizes the Bloomington school perspective on polycentricity: many centers of decision making; ordered relationships that persist in time; many legitimate rules enforcers; single system of rules; centers of power at different organizational levels; spontaneous order resulting from free entry and exit; the alignment between rules and incentives (rules are considered useful); and the public involvement in rule design (rules about changing rules, connection between rules and consequences relatively transparent). We are further elaborating the concept below in order to encompass a more general perspective.

As far as our analysis of polycentricity is concerned, we have to decide whether the candidates of polycentricity mentioned in the previous section (municipal governments and urban networks, science, representative constitutional democracy, free market, common law) should indeed be all classified as such. The only way to approach this dilemma is to start by treating the examples *as if* they truly are cases of polycentricity and

see what happens. In other words to see (1) whether the resulting concept has any obviously counterintuitive or seriously objectionable consequences and (2) whether it provides us with any useful new insights about the workings of the phenomena it is meant to capture. As we shall see, the resulting concept does indeed offer intriguing insights, for instance about the conditions under which polycentric order breaks down (into either authoritarianism or violent chaos). Moreover, it allows us to better understand the manner in which spontaneous order phenomena fit within the larger framework of social order, i.e. how such phenomena interact with other social phenomena (be they polycentric or monocentric). Thus, there are solid grounds to consider that the examples are indeed different manifestations of the same general phenomenon of polycentricity. Finally, there are other potential examples, such as international law, which have not been considered, but which nonetheless seem to fit the definition of polycentricity. Thus, the resulting concept seems to have a certain amount of traction outside the original set of empiric cases used in its creation.

The first step in concept design is to map more explicitly the detailed attributes and indicators characterizing the different paradigmatic cases of the phenomenon of interest (Gerring, 2001; Goertz, 2005). This allows us to determine the necessary and sufficient conditions for polycentricity and to detail the family resemblances. In the previous sections we have already got a set of insights about what attributes are relevant and why. We are now building up on these insights. Analyzing the real-world candidate examples

of polycentricity provided in the previous section according to those attributes, leads to a tentative synthetic picture of the cases.

The result of this analysis can be summed up as follows. Polycentricity has three basic features which are to be explored in more detail in the following way: (1) The *multiplicity of decision centers* is analyzed in terms of those centers ability to implement their different methods into practice (what we call the “active exercise of different opinions”), in terms of the presence or absence of hierarchy, and in terms of the existence of a set of common/shared goals. (2) The institutional and cultural framework that provides *the overarching system of rules* defining the polycentric system is analyzed in terms of whether the jurisdiction of decision centers is territory-based or superimposing, in terms of whether the decision centers are involved in drafting the overarching rules, and of whether the rules are seen as useful by the decision centers (regardless of whether or not they are involved in their drafting). (3) Finally, the spontaneous order generated by evolutionary competition between the different decision centers’ ideas, methods and ways of doing things is analyzed in terms of the nature of entry in the polycentric system (free, meritocratic or spontaneous - is that in case of “free entry” a decision center can *decide* to enter the polycentric system and existing decision centers cannot prevent this, while in case of the “spontaneous entry” no decision is involved -- either on the part of the newcomer or of the existing decision centers --, but the entry happens naturally and more or less unavoidably), in terms of whether there exists free exit, in terms of whether the relevant information for decision making is public (available to all decision centers

equally) or secret, and in terms of the nature of the aggregating mechanism (market, consensus or majority rule) of the different decisions made by the decision centers.

The idea that there exists an overarching system of rules deserves a brief elaboration and further clarification. We have already summarized in the first section Ostroms' analysis of the problem of the system of rules, an analysis elaborated in the context of the debate about the meaning of federalism and the nature of metropolitan governance. At this juncture, another point should be added. The idea of an "overarching system of rules" has the function of an operational criterion that allows us to clearly distinguish between the members of a polycentric system and its outsiders. "Outsiders" are those agents who are not subjected to the same system of rules, as "insiders" are. This might be the case either by design, with a clear functional role in mind (e.g. creates the possibility of impartial arbiters), or it may be the result of systemic imperfections and failure (e.g. due to outsiders' lack of commitment and will, due to their institutional inability to integrate, or due to the inability of enforcers to integrate them). The outsider might either have some additional rights (as in the case of an arbiter) or fewer rights than the members (as in the case of an agent that fails to integrate and commit to the system of rules, which can bring various disadvantages).

This idea of identifying the members of a particular polycentric system based on the system of rules to which they are subjected, stems directly from the Institutional Analysis and Development (IAD) framework (Ostrom, 1990; 2005). According to the 'institutional

factors' component of this framework, the institutional positions (or roles) could be identified by looking at how the rules-in-use regulate access and other rights to various resources and information. That not only creates certain structures of authority but at the most basic level separates insiders from outsiders. In addition to that, one of the important aspects in such an approach is to identify nested structures of authority. These nested structures correspond to the relationships between different polycentric systems that coexist and interact. Thus, when one identifies the “outsiders” of a polycentric system, especially those that act as outsiders because they have additional rights, one often identifies the connection points between different polycentric systems. For example, the judge in a commercial dispute can be seen as the connection point between two polycentric systems: the market and the juridical system. Last but not least, it is also important to mention that when we are talking about the members of a polycentric system, we are talking not so much about the flesh and blood individuals, but about institutional roles within that system (i.e. about the institutional rules consisting of a bundle of rights and obligations attached to an individual). This is noteworthy because the same individual may be acting in different circumstances and at different moments in time, as part of different polycentric systems.

Based on the catalogue of relevant attributes and indicators, we are in the position to analyze each candidate for polycentricity and see how they fare in terms of each considered characteristic. The most important outcome is to tentatively define the necessary conditions for polycentricity, i.e. those indicators that are found in all cases:

- Active exercise of diverse opinions and preferences (denoted “P₁” below): by “active exercise” we mean that the opinions (ideas or methods about how to conduct something) are actually implemented into practice by at least one decision center, rather than just being enounced by someone (i.e. existing merely as a proposal or a hypothetical).
- Incentives compatibility – alignment between rules and incentives (P₃): the rules are considered useful by the agents subjected to them and the consequences of the rules are relatively transparent. If the alignment between rules and incentives doesn’t exist, we are *not* dealing with an instance of polycentricity, even if there is a multiplicity of decision centers actively exercising their opinions and preferences (as we shall see below, this corresponds to a case of polycentricity degenerating into violent anarchy).

These two essential conditions for polycentricity are in line with the Bloomington school definition we have already seen in a previous section. In other words, the Bloomington school, although it focused on a rather small number of cases, stumbled upon a definition which, at least in part, is of far greater generality than one might expect.

An interesting and important aspect of the issue is the problem of decision making levels. One could easily construe a division of the candidate cases between hierarchical and non-hierarchical cases, i.e. cases in which *prima facie* there are multiple layers of decision makers and cases in which there is an unstructured ensemble of decision makers. For this reason one could legitimately see the supposedly hierarchical polycentric systems as a bundle of two or more non-hierarchical polycentric systems. Thus, we suggest that the autonomous decision making layers aspect is also part of the essential attributes of polycentricity:

- Autonomous decision making layers (P_2): the different overlapping decision centers make operational decisions autonomously from the higher level.

The issue of hierarchy in polycentricity is definitely more complex than this (see for instance the problem of overlapping and nestedness in Sproule-Jones 1993). However, even if debatable, the lack of steep and intrusive hierarchies rings closer to the truth than potential alternatives. But one should recognize the ambiguities and complexities involved, especially as an intriguing point about polycentric systems is the fact that rule enforcers are in many cases outsiders (a different type of agent) and thus a polycentric (sub)system depends either on the functioning of another system or on recognized mutual interest.

Once the core area has been tentatively outlined, we move now to the differences between the various instances of polycentricity. A tentative list such as the following offers a good way to advance the argument by highlighting non-necessary conditions and thus mapping the varieties of polycentricity:

Decision centers and how they work:

A₁. Common/shared goals

A₂. Individual goals

To that one should add the P_1 and P_2 conditions:

- P₁. Active exercise of diverse opinions and preferences
- P₂. Autonomous decision making layers

Characteristics of the institutional/cultural framework (the overarching system of rules):

- B₁. Territorial jurisdiction of decision centers
- B₂. Non-territorial jurisdiction of decision centers

- C₁. Agents directly involved in rule design
- C₂. Rules designed by outsider

- D₁. Consensus
- D₂. Individual decisions
- D₃. Majority rule

To that one should add the P3 condition:

- P₃. Incentives compatibility - alignment between rules and incentives

Spontaneous order – how the evolutionary competition works, and how decisions are aggregated:

- E₁. Free entry
- E₂. Merit-based entry
- E₃. Spontaneous entry

- F₁. Free exit
- F₂. Constrained exit

G₁. Public information

G₂. Private information

We have now the elements needed to articulate a possible logical structure of polycentricity (fig. 1):

Polycentricity =

$$= P_1 \& P_2 \& P_3 \& (A_1\#A_2) \& (B_1\#B_2) \& (C_1\#C_2) \& (D_1\#D_2\#D_3) \& (E_1\#E_2\#E_3) \& (F_1\#F_2) \\ \& (G_1\#G_2)$$

where “&” denotes the logical “and”, while “#” denotes the logical “exclusive or”.

In other words, if one takes as parameters the features used in our tentative analysis, the logical structure derived from the paradigmatic cases considered, allows for 288 different possible types of polycentric systems (there are 288 possible combinations of the basic indicators permitted by the above logical formula). Needless to say, as in any formal typology, some of those exist while others have a purely conceptual and hypothetical nature.

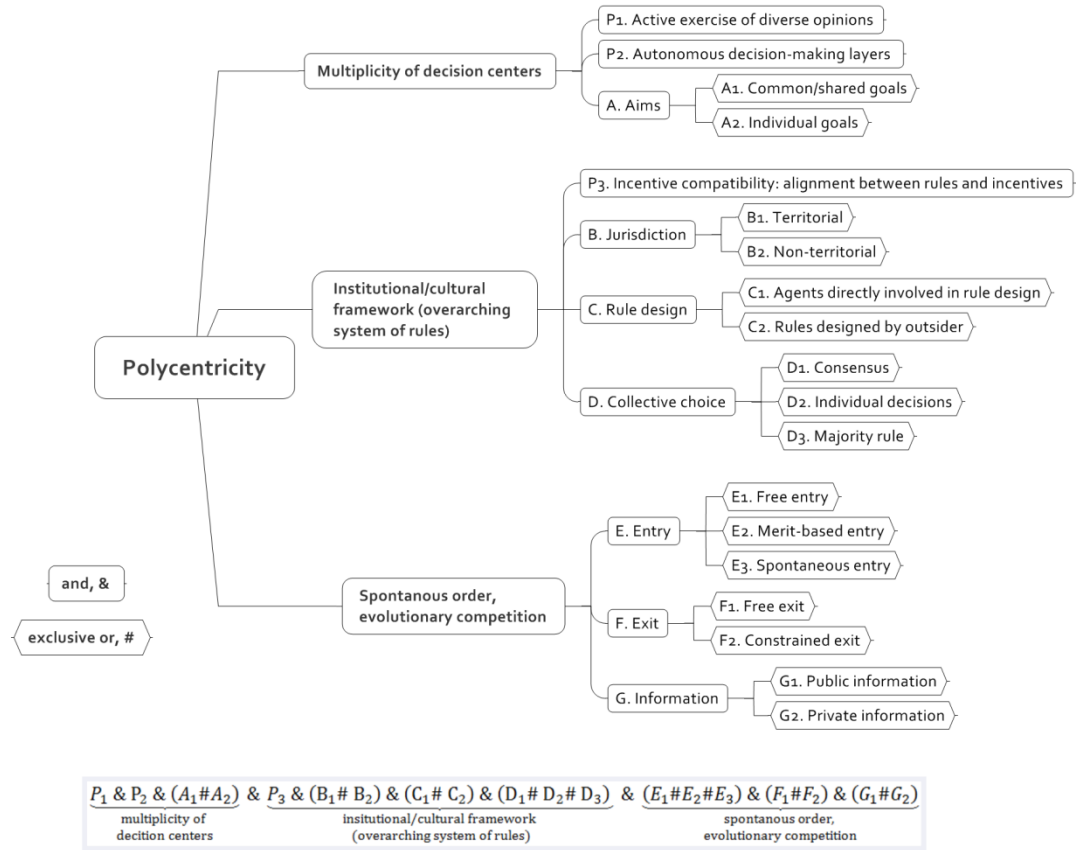


Figure 1: Logical structure of polycentricity

One of the most interesting implications of this analysis is that one could explore not only the nature and structure of polycentric systems, but also their pathologies and breakdown. If one accepts our approach, there are nine fundamental ways in which polycentricity may break-down:

- Multiplicity of decision centers break-down:
 - non- P_1 : active exercise of diverse opinions eliminated
 - non- P_2 : the system becomes hierarchical
 - non- $(A_1 \# A_2)$: the activity becomes considered meaningless (the goals disappear, the polycentric system disappears because it no longer serves a function)
- Overarching system of rules break-down:
 - non- P_3 : rules no longer considered useful by agents
 - non- $(B_1 \# B_2)$: agreement about territoriality disappears (decision centers fight over territorial authority)
 - non- $(C_1 \# C_2)$: no agreement about rule design (rules are no longer considered legitimate and their enforcement becomes difficult to impossible)
 - non- $(D_1 \# D_2 \# D_3)$: the rule of law breaks down - power-based decisions (authority rule)
- Spontaneous order break-down:
 - non- $(E_1 \# E_2 \# E_3)$: no entry (monopoly)
 - non- $(F_1 \# F_2)$: the constituency of the system is unclear (some decision centers accept X as part of the system while others do not)
 - non- $(G_1 \# G_2)$: no available information relevant to decision making (random decisions, relation between consequences and rules unclear, spontaneous order turns into drift)

The break-down of polycentricity may give way either to a monocentric system (authoritarian or not), or to chaotic violent anarchy. It is clear that certain versions of polycentricity are closer to these break-down conditions than others. In the light of our approach it looks like the following attributes make the polycentric system more

vulnerable: A_1 , B_1 , C_2 , D_3 , E_2 , F_2 , G_2 . These particular attributes are closest to the corresponding break-down condition described above; e.g. if rules are designed by outsider (C_2) it is more likely that they will be seen as illegitimate, or majority rule (D_3) is closer to a power-based decision than consensus or individual decisions, or a system based on shared goals (A_1) can lose meaning (if the sense of common purpose is lost) easier than one which is based on individual goals. Needless to say, this may also prove an important insight for the field of positive anarchy studies, as peaceful anarchy may come about from violent anarchy via the same attributes. For example peaceful anarchy may appear as interacting agents develop a sense that certain rules are mutually useful (Leeson, 2005; 2009).

The implications of an analysis along the lines defined above could go even further. Proposed reforms of existing polycentric systems often involve changing the value of one of the six non-necessary attributes. For example critics of the free market system often argue that in case of certain goods or services (such as education or healthcare) the D attribute should be changed from D_2 to D_3 (i.e. individual decision should be replaced by majority rule). Similarly, in regard to other issues, such as banking, libertarians argue that the existing D_3 attribute should be changed to D_2 (i.e. interest rates determined by the Central Bank should be freed and left entirely at the decision of individual banks). Or, advocates of market regulations, such as licensing, propose that the E_1 attribute of the market should be changed to E_2 (i.e. that free entry should be replaced by merit-based entry). As yet another example, advocates of human rights propose that the B_1 attribute of

international law should be changed to B_2 in regard to certain instances (i.e. that certain rights should be territory independent). Finally, it is interesting to point out that there has been a historic transition of the juridical system from C_1 to C_2 , transition that marked the separation between the juridical power and the legislative and executive powers (i.e. ideally, the rules that constrain the executive power are no longer designed by the executive power itself), and the separation between constitutional rules and common law. Similarly, it is usually considered undesirable when firms and corporations get involved, mainly via lobbying, in the design of market regulations, i.e. the C_2 attribute of the market (agents not involved in rule design) is considered desirable and, historically, the transition from mercantilism to modern capitalism may be seen as being in a sense a transition from C_1 to C_2 . However, in case of democracy, the transition from C_2 to C_1 was of crucial importance (citizens are no longer completely separated from the process of rule design) and C_1 can be considered the essential attribute of a democratic system. To sum up, the framework provided by a conceptualization and analysis on the lines introduced above has the potential to illuminate an entire set of issues related not only to the way we understand polycentric systems but also to the design and policy change in social systems in general.

Conclusions

The concept of polycentricity, as developed and defined in the Polanyi-Ostrom tradition and as elaborated above, is not only useful as an analytical framework but also for making analogies between different complex systems. At the same time it could open up the possibility of very challenging and interesting analytical and normative speculations

based on the comparative analysis of different forms of polycentric arrangements and governance systems.

The point is that a polycentricity framework on the lines defined above provides, at minimum, an analytical structure for the study of certain social phenomena. However, our point is that there is more into it: it provides a method for drawing *non-ad-hoc analogies* between different forms of self-organizing complex social systems as well as a means to challenge and bolster our institutional imagination. These analogical insights have to be tested and *if* many of them turn out to be correct, *than* the concept of polycentricity is indeed useful in additional ways. In the light of the previous work by the Bloomington school and others, it seems very likely that it can generate interesting new lines of inquiry as well as shed new light on existing debates. In the end, if our approach is correct, one could identify not one but many multifaceted forms of polycentricity. The stake of this whole approach is to provide a way of discovering how to improve the functioning of different configurations and complex social systems by means of drawing analogies between them. Different complex systems have weak and strong points. The challenge is how to bring the strong points from one area into another in order to counter the weak points. The classic approaches so far have usually drawn upon analogies with markets; e.g. Ostrom's idea of market-like interorganizational arrangements or of public entrepreneurship brings market-like attributes to public administration, or Hayek's emphasis of common law and Weingast's idea of market-preserving federalism bring market-like attributes to the evolution of legal systems. On the other hand, most

advocates of market regulation propose to make the market more like democracy. Unfortunately most of these arguments lack any supporting overall conceptual framework. At minimum one needs a more systematic approach to how analogies between complex systems should or can be made. Polycentricity can be utilized as a conceptual framework not only for drawing inspiration from the market, but also from democracy or any other complex system incorporating the simultaneous functioning of multiple centers of governance and decision making with different interests, perspectives and values.

CHAPTER 2: POLYCENTRIC STRUCTURE AND INFORMAL NORMS: COMPETITION AND COORDINATION WITHIN THE SCIENTIFIC COMMUNITY

Introduction

Two decades ago Douglas North has pointed out that “[w]hile there is a substantial literature on the origins and development of science, very little of it deals with the links between institutional structure, belief systems, and the incentives and disincentives to acquire pure knowledge” (1994: p. 364). There were partial exceptions to this lack of concern such as the institutional approach of Polanyi (1962) and Tullock (1966), Levy’s (1988) analysis of the “market for fame and fortune”, as well as the papers collected in Mirowski & Sent (2002) which focus on “(1) science conceived as a production process; (2) science conceived as a problem of information processing; (3) science conceived as an economic network of limited agents” (Geuna 2003). More recently, there has also been some increased interest in analysing scientific entrepreneurship and the reward structure in science (Dasgupta & David 1994; Stephan 1996; Stephan & Levin 1996; 2012; Stephan & Everhart 1998; Botos & Boettke 2002; Leonard 2002; Scott 2004), and the dynamics of scientific prestige including the possibility of distorted research agendas

(Wible 1998; Adams, Clemmons & Stephan, 2005; Bergstrom 2007; Boettke, Coyne & Leeson 2014).

The purpose of this chapter is to bring Polanyi-Tullock's institutional perspective up to date by relying on Bloomington school's institutional analysis and especially on the theory of polycentricity (V. Ostrom 1999; E. Ostrom 2005: chapter 9; Aligica & Boettke 2009; Aligica & Tarko 2012). The institutional perspective is necessary for understanding how such a large-scale transnational and decentralized organization dedicated to a vague common goal (truth seeking) can possibly work, especially considering that truth is generally considered to be a public good (Arrow 1962; Johnson 1972; Dasgupta & David 1987; 1994).

Interestingly for such a large community, the norms and rules of the scientific community are mostly cultural and informal. It is commonly claimed that communities larger than about a hundred people cannot possibly work effectively without formal rules and some form of central management and monopoly enforcement of those rules. For example, Dixit (2003) claims that "[h]onesty is self-enforcing only between pairs of sufficiently close neighbors. Global honesty prevails only in a sufficiently small world. The extent of self-enforcing honesty is likely to decrease when the world expands beyond this size." These claims are a result of a theoretical model. But if Dixit's model would have been

empirically valid, and not merely internally consistent, it would be a demonstration that science was literally impossible.¹

To put things in perspective, consider a number of scientific communities by field. The economics community currently has almost 34,000 registered members at IDEAS Research Papers in Economics, and there are currently over 209,000 registered authors at the Social Science Research Network. The American Chemical Society has over 164,000 members, working both in the academia and in the private sector (almost 25,000 of them are professors). According to the American Institute of Physics, only in United States there are over 10,000 physics and astronomers working in the academia. The Society of Biology has about 80,000 members, and the 23 specialized associations that are part of the Federation of American Societies for Experimental Biology span from a few hundred members (e.g. the American Peptide Society) to almost 15,000 members (The Endocrine Society). Yet, despite their size and their complex nested organizational structure, scientific communities have no constitution laying down the rules, e.g. of how peer-review should be made or about the “scientific method” that should be used, and no monopolistic governing body enforcing such rules and deciding who is or isn’t part of the scientific community. Experiments with new rules, such as open-access publishing and pre-prints archives without peer-review, and new associations created without a need for permission from higher bodies, are a natural and significant part of the system. Moreover,

¹ Doubts regarding Dixit’s sweeping claims have been raised before. For example, it seems that large scale heterogeneous societies (of millions of people), held together mainly by informal mechanisms, have in fact existed (Leeson 2014).

although we can separate such scientific disciplines, there is enough overlap between them that we can still talk about science as forming a single, heterogeneous, community (Cosmides & Tooby 1992). Indeed, some of the most important discoveries over the past century have happened precisely at the interface between disciplines, e.g. quantum mechanics at the interface between chemistry and physics, genetics at the interface between chemistry and biology, neuroscience at the interface between biology and psychology, or behavioural economics at the interface between economics and psychology.

Despite its size, the scientific community is relatively successful in catching and punishing opportunistic behaviour that threatens the production of its public good. Moreover, it has no geographic barriers, and yet it manages to delineate membership in a decentralized and largely informal manner (single organizations and associations may have formalized internal rules, but not the community as a whole). The scientific community is arguably one of the most successful human organizations ever created, both with respect to its declared main purpose (truth seeking) and with respect to secondary goals such as obtaining large government subsidies (while maintaining independence and freedom from interference) and obtaining preferential treatment in public schools or in courts of law (despite often being highly disruptive to common belief systems). It is remarkable that the internal structure of this organization is so different from that of other large scale organizations such as states or multi-national corporations. Interestingly, the associations that look most similar to the scientific community in terms

of their internal mode of organization are religious communities, which may perhaps be due to some historical path dependency (Smolin 2006).

The scientific community highlights the fact that polycentric governance can and do, at least sometimes, scale up, even in the absence of formalized and centralized control. As Polanyi (1951; 1962) originally has argued, science is so successful precisely *because* of its decentralized and quasi-anarchic organization. Consider for example its ability to go against some of our most cherished political ideals, such as the idea of democratic governance in which rules are made in accordance with majority will and opinion. As forcefully argued by some critics of science (Feyerabend 1978; 1993), science is virtually unique in successfully overriding the democratic ideal and shaping public policy (from school curricula to monetary policy) in the direction of truth – as established by the scientific community – *instead* of majority opinion. This would not have probably been possible had the scientific community not had such a decentralized and non-hierarchical internal structure. Its public credibility and authority in defining “truth” for everybody else stems from the fact that many *separated* but informed individuals come in support of the same position. Without the decentralized structure, the uniformity of opinion could have been believed to be the result of the hierarchy.

In what follows, the chapter first describes the institutions of the scientific community, applying the polycentricity model to science in order to understand how it is possible for such a large scale cooperative enterprise to work, and, then, discusses some of the

possible distortions of science as resulting from departures from the polycentric organization.

1 The institutions of the scientific community

Polanyi (1962) points out that “scientists, freely making their own choice of problems and pursuing them in the light of their own personal judgment, are in fact co-operating as members of a closely knit organization”, and “the principle of their co-ordination ... consists in the adjustment of the efforts of each to the hitherto achieved results of the others”. This has led Tullock (1966) to ask “why the individual scientist, who feels quite free and unconstrained, is nevertheless led to investigate problems of interest to others, and how, without any conscious intention, he exerts influence on the research done by other scientists” (p. 7). Moreover, “[h]ow does it happen that we can depend upon scientists not only to refrain from faking research results, but to exercise the most extreme precautions to insure accuracy?” (p. 5) Tullock’s basic answer is that “[t]here exists a community of scientists, and this community is a functioning social mechanism which co-ordinates the activity of its members” (p. 5). In order to explain the success of science we thus have to understand this “social mechanism”. According to Polanyi (1962), the critical problem that needs to be solved by the organization of the scientific community is this:

Scientific publications are continuously beset by cranks, frauds and bunglers whose contributions must be rejected if journals are not to be swamped by them. This censorship will not only eliminate obvious absurdities but must often refuse publication merely because the conclusions of a paper appear to be unsound in the light of current scientific knowledge. ... [U]northodox work of high originality and merit may be discouraged or altogether suppressed for a time. But these risks have to be taken. Only the discipline imposed by an effective

scientific opinion can prevent the adulteration of science by cranks and dabblers.

The real question in explaining scientific progress then concerns the optimality of the rules and norms, “scientific standards” as Polanyi calls them, based on which the community accepts or rejects new theoretical proposals and new members, given the size of the community and the available technologies for sharing information. Whether or not the scientific community succeeds in its purpose of creating accurate theories of the world depends on its institutional arrangement rather than on a particular method (Kitcher 1993). Moreover, it is the nature of those rules and norms that distinguishes the scientific community from religious organizations such as the Catholic Church as well as from the philosophical community (Kendall 1960; Smolin 2006).

Polanyi (1951; 1962) created and used the institutional perspective on science for the purpose of drawing more general conclusions about the proper way in which a social system should be organized (for example, he engaged in the socialist calculation debate). The key concept was “polycentricity” and science was Polanyi’s example of a very successful polycentric system. This idea proved very fruitful. To name just two of the most prominent examples, it was used by Fuller (1978) to analyse the proper limits of adjudication by courts (see also King 2006), and by Vincent and Elinor Ostrom to analyse the conditions under which governance systems are robust to shocks and are able to deal efficiently with public goods and common-pool resources problems (V. Ostrom 1972; V. Ostrom 1999; E. Ostrom 2005: chapter 9; McGinnis & E. Ostrom 2011). Paradoxically, the idea has had fewer echoes in the philosophy of science and the

economics of science literatures. This chapter returns to Polanyi's concern with understanding the scientific community with the added advantage of now being able to rely on a much better developed concept of polycentricity, as it has emerged from the new institutionalist literature.

The logical structure of the concept of polycentricity, in light of the different cases in which the concept has been successfully used, has been recently mapped out by Aligica & Tarko (2012), providing a succinct analytical guide for understanding any polycentric system (see also Aligica & Tarko 2013 and Aligica 2014). Figure 1 gives the “logical structure” of polycentricity.

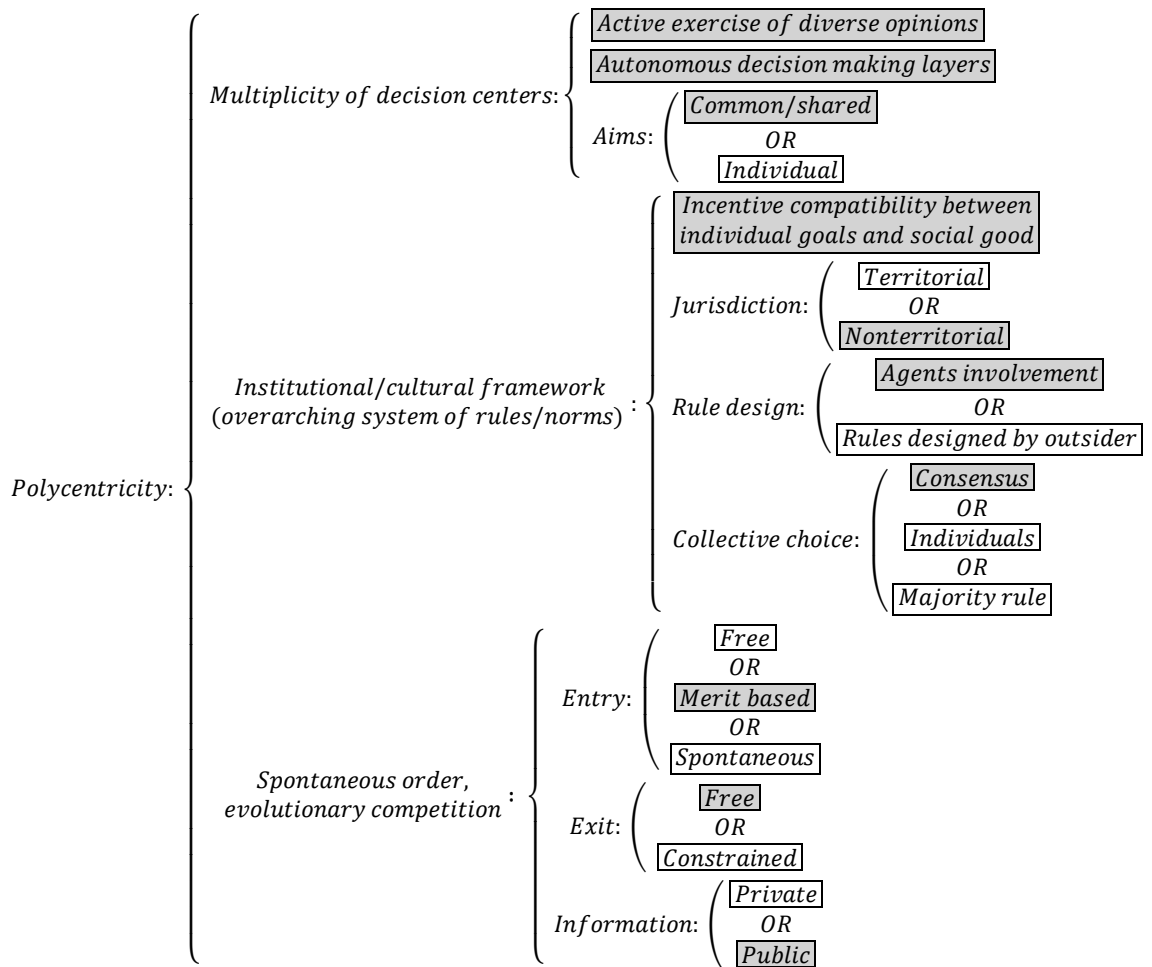


Figure 2: The map of possible polycentric systems, with the features of the scientific community highlighted

A polycentric system is a *multiplicity of decision centres* acting independently but under the constraints of an *over-arching set of norms and rules* which create the conditions for an *emergent order* to occur via a bottom-up competitive process. The key idea is that the over-arching set of rules constrains the competitive behaviour in the direction of a

beneficial emergent outcome. What makes the scientific community so interesting for both the institutional economist and the industrial organization economist is the fact that this over-arching set of rules is a set of *informal* rules emerging and evolving endogenously in a decentralized fashion. Thus, science is a quasi-anarchic enterprise not only in the sense that there is no monopoly of rules enforcement, but also in the sense that the over-arching set of rules evolves without any one centre having ultimate decision power. In the case of the scientific community, the structure of polycentricity described in chapter 1 (fig. 1) translates into the institutional features highlighted in figure 2, with the body of scientific knowledge being the emergent outcome. This account of polycentricity tells us on which aspects of the institutional structure (which, at first glance, may seem confusingly complex) we should focus our attention. Let us give more details about each element highlighted in fig. 2.

The polycentric nature of the scientific community is evident even within a specific domain. There are multiple research centres each with its own somewhat different research agenda and preferred methods of investigation. Journals and publishing houses also often lean in one direction or another either explicitly (in their stated mission) or informally (due to the personal idiosyncrasies of their editors). Science is thus essentially anarchic in the sense that there are no official leaders, no universal research method, and the entire process works on the basis of a complex and ever-changing *prestige network*. The impact of scientific publications, i.e. their popularity and usefulness within the scientific community, and implicitly the impact of the journals and publishing houses that

publish them and of the academic institutions that create the research, is what generates the evolution in time of this prestige network.

The idea that science does *not* have a unique method is at the core of the controversy surrounding Feyerabend's claim that science is an anarchic community (1993).

Feyerabend made the counterfactual argument that, in case of physics, a strict adherence to any of the "scientific methods", proposed by various philosophers of science, would have severely hampered progress and would have prevented actual discoveries – i.e. actual scientific practice is much looser than philosophers of science have often liked to admit. To put it differently, the critical bottleneck separating science from pseudo-science is not at the level of research *practice* (how research is done), but at the level of *acceptance* of the research by other scientists. Kitcher (1993) makes a similar institutional argument. Peart & Levy note that having a strict scientific method can be seen as a useful device for reducing expert bias and wishful thinking – it amends the incentive to choose the method that leads to one's preferred result. However, "[t]he problem with such a suggestion is that it presumes the community can identify and agree upon the optimum estimator or procedure. Experience has long demonstrated the contrary." (Peart & Levy, forthcoming: chapter 7).

Looking at the institutions of science, rather than its presumed method of inquiry, is revealing. The scientific community does many things contrary to common intuitions and theories about the conditions for cooperation in large scale communities. Perhaps most

strikingly, the entry/exclusion rules are lax and unclear. Even authors like Elinor Ostrom (1990), who have significantly expanded our understanding of how communities self-organize, have emphasized entry/exclusion rules as essential for success. While the entry costs for individuals are relatively high involving several years of one's time and effort – which corresponds to what Aligica & Tarko (2012) call “merit-based entry”, there are no clear entry rules at the level of new research centres. For example, when Freud and psychoanalysis was rejected by mainstream psychology, he and his collaborators have simply organized an alternative society, while still claiming to belong to the scientific community (Watson 2006: chapter 36). There was no formal institutional mechanism by which such a claim could be rejected. On the contrary, at least for a while, the new society has proven highly successful by the benchmark of the informal bottom-up acceptance mechanisms of publications, citations and wider adoption.

These lax entry rules go hand in hand with the non-hierarchical and non-territorial organization of science. Interestingly, scientists tend to be much more mobile across borders than the general population, both now and in the past (Stephan 2012: chapter 8).

As Tullock has noted (1966: pp. 5-6):

This community is a most peculiar one, with its members living in different countries and speaking different languages. Further, it is not even geographically organized. A French scientist studying a certain virus may find that the other scientists whose work is most important to him live in Japan, Italy, Russia, the United States, and Argentina. In a real sense they are his neighbors in the scientific community, but the professor of astronomy who lives next door to him is almost a foreigner in terms of their scientific relationship. Membership in this community is completely voluntary, and the scientists do not think of themselves as controlled by the community or as participating in the control of other scientists. As Lord Brain

says, “apart from contributing to . . . [the body of knowledge], they have no collective consciousness, interest, or aim.” Nevertheless, their search for knowledge is far from random.

The system has not only relatively free entry but also free exit, in the sense that scientists (even very famous ones) who are no longer willing to accept the “scientific consensus” become naturally isolated and ignored – the citation mechanism for granting prestige works both as an inclusive mechanism and as an excluding mechanism. As Kendall (1960: p. 979) put it, “[t]he ultimate fate of the entrant who disagrees with the orthodoxy but cannot persuade the community to accept his point of view is, quite simply, isolation within or banishment from the community”. Boettke (2012: chapter 17) notes the same about the workings of the economics community, but claims that the economic orthodoxy is too strict and, also, that mainstream economists don’t have enough scientific reasons for enforcing the current particular orthodoxy. According to the institutionalist perspective, in order to see whether this criticism is valid, one would need to look more closely at the specifics of the norms of successful scientific communities (such as those of physics, chemistry or biology) and see whether, or to what extent, the economics community complies with them.

To give a few examples, Einstein’s case is quite spectacular (Smolin 2006). Although he was one of the creators of quantum mechanics and relativity theory, he ended up refusing to accept the probabilistic interpretation of quantum mechanics. This has led his research on “the grand unified theory” in a direction that has been, and still is, generally considered useless and misguided. His isolation in this regard was so complete that even

the other physicists at Princeton's Institute for Advanced Study ignored him. He was basically excluded (or self-excluded) from the theoretical physics community. He was an outsider who managed, first, to get accepted to widespread acclaim, and, later, to get isolated almost as fast as he got accepted. Strikingly similar examples from economics are Hayek and Mises. They began as highly respected members of the economics community, suffered a period of complete neglect and isolation – as a result of their refusal (justified or not) to go along with the mainstream –, and, at least Hayek, later regained some mainstream fame and respect when real-world events partially vindicated his views.

The reason why the scientific community works, i.e. the way in which it puts to good use its anarchic nature of many research groups that “actively exercise a diverse set of opinions”, is that (1) scientists share a common/shared goal (i.e. truth), (2) decisions about what counts as “truth” are taken by consensus (detailed in the next section), and, (3) importantly, there exists an alignment between the norms of the scientific community (described explicitly below) and the incentives of individual actors, in the sense that these rules are generally considered useful for promoting truth-seeking and discovering errors. There are no rules about changing the rules, but the connection between rules and their consequences is relatively transparent and easy to understand. Scientists subjected to those rules and norms are involved in their design – there is no outside “legislative body” designing the rules. Science is self-governing. These rules and norms are also not entirely fixed – they have evolved as the community dramatically expanded in numbers (e.g. the

adoption of peer-review publishing was such an adaptation), as the technology for sharing information improved, and as the sources of funding have changed (e.g. the adoption of the rule that conflicts of interests are to be disclosed). The information relevant for decision making (i.e. the scientific literature) is public and, at least within the community, the costs of access are small.

The argument is thus that the functioning of the scientific community and the progress of science is the result of this community having a particular culture with a particular set of values: “*Science has succeeded because scientists comprise a community that is defined and maintained by adherence to a shared ethic*” (Smolin 2006: p. 301, emphasis in the original). This culture may be promoted *within* certain formal organizations, but ultimately these organizations themselves are a product of this scientific culture. So, what is the exact nature of this scientific culture? Kendall and Smolin provide a useful guide. According to Smolin (2006) the norms of science are as follows: all information is public; arguments about truth matter, while persons or statuses do not; reaching consensus within the community is an important goal; when consensus is not available, skepticism is valued and promoted; theories are often questioned just for the sake of questioning them (there is a certain separation between experimenters and theoreticians and an experimenter doesn’t need to provide any prior reason for questioning a theory, even a very well-established one). Smolin argues that although these values are somewhat vague, they still offer a sufficient guideline to understand the forces behind the

organization of the scientific community. Moreover, he argues that *failures of the scientific community are caused by departures from these norms*.

Authors like Polanyi, Kendall and Smolin emphasize that the gradual progress of science is a result of a combination between its conservative nature (i.e. having a large prior favouring of the existing theory against new proposals), the value placed on reaching consensus, and its scepticism related to the ability of any existing theory to fit *all* the facts. As Richard Feynman put it, science is a form of “organized scepticism in the reliability of expert opinion”, but within the context of a search for consensus (quoted by Smolin 2006: p. 307). Unlike philosophical scepticism, scientific scepticism has limits: “[i]f an issue can be decided by people of good faith, applying rational argument to publicly available evidence, then it must be regarded as so decided” (Smolin, 2006: p. 301). This is why, Smolin argues, philosophy doesn’t witness the same kind of progress that science does – this has to do with its subject matter only partially, and more with the underlining shared ethic of the community: in philosophy nothing is ever considered as “settled” and consensus is not as highly valued as in science. Kendall (1960) calls this consensus the “orthodoxy”, and notes that “there is a strong presumption that prior investigators have not labored entirely in vain, and that the community is the custodian of – let us not sidestep the *mot juste* – an *orthodoxy*, no part of which it is going to set lightly to one side”. This orthodoxy is crucial for progress as it “must be understood as concerning first and foremost the frame of reference within which the exchange of ideas and opinions is to go forward. That frame of reference is, to be sure, subject to change,

but this is a matter of meeting the arguments that led originally to its adoption, and meeting them in recognition that the ultimate decision, as to whether or not to change it, lies with the community.” Polanyi (1962) refers to this as the “dynamic orthodoxy”.

By contrast, if “rational argument from the publicly available evidence does not succeed in bringing people of good faith to agreement on an issue, society must allow and even encourage people to draw diverse conclusions” (Smolin 2006: p. 301). While the emphasis on consensus distinguishes science from philosophy, it is this second norm that distinguishes science from religion, which tries too hard to enforce consensus even when “people of good faith” still disagree. It is worth quoting Smolin more extensively on this matter:

[I]t is not sufficient to characterize science as an ethical community, because some ethical communities exist to preserve old knowledge rather than to discover new truths. Religious communities, in many cases, satisfy the criteria for being ethical communities. Indeed, science in its modern form evolved from monasteries and theological schools – ethical communities whose aim was the preservation of religious dogma. ... I would like to introduce a second notion, which I call an *imaginative community*. This is a community *whose ethic and organization incorporates a belief in the inevitability of progress and an openness to the future*. The openness leaves room, imaginatively and institutionally, for novelty and surprise. Not only is there a belief that the future will be better, there is an understanding that we cannot forecast how that better future will be reached. Neither a Marxist state nor a fundamentalist religious state is an imaginative community. They may look forward to a better future, but they believe they know exactly how that future will be reached. (Smolin 2006: p. 303, emphasis in the original)

As long as there are grounds for reasonable people to disagree, the polycentric nature of the scientific community is crucial for its success because it is this polycentric

organization that secures the diversity of opinions. It is not enough to rely on *individual* scientists being creative and able to “think outside of the box”. It is essential for them to have *institutional environments* where they can pursue their viewpoints. Given the social nature of creativity – the fact that groups of people tend to generate more knowledge than separated individuals – the diversity of institutional environments is important. This is often how controversies are kept alive, and, as long as “people of good faith” still disagree,

controversy is essential for the progress of science. My first principle says that when we are forced to reach a consensus by the evidence, we should do so. But my second principle says that until the evidence forces consensus, we should encourage a wide diversity of viewpoints. ... Science proceeds fastest when there are competing theories. The older, naive view is that theories are put forward one at a time and tested against the data. This fails to take into account the extent to which the theoretical ideas we have influence which experiments we do and how we interpret them. *If only one theory is contemplated at a time, we are likely to get stuck in intellectual traps created by that theory. The only way out is if different theories compete to explain the same evidence.* (Smolin 2006: p. 304, emphasis added).

Such observations made by science practitioners like Smolin are best understood within the institutional theory of polycentricity. It is this theory that provides the framework for understanding the social role played by the scientific norms identified by Smolin or Kendall. Tullock and Polanyi have identified the challenges faced by a large scale informal community, but we can now better understand the role played by these norms in solving these challenges.

2 Scientific competition, coordination, and consensus-building

The shared goal aspect of the scientific community creates a somewhat different internal dynamic as compared to that of other types of polycentric systems, such as a market, in which actors pursue distinct individual goals. The norms and desiderata of the scientific community create the *framework* within which scientific research happens. But in order to fully understand how scientific progress actually occurs, one needs to further detail the *competition* and *consensus building* processes. Roughly speaking, the consensus sought by science

is not synonymous with unanimity – nor with having achieved a simple majority. Instead, consensus connotes *broad agreement after a process of deliberation*, during which time most members of a group coalesce around a particular idea or alternative. ... A consensus-driven process, in fact, often represents an *alternative* to voting. ... Science, at least ideally, is exactly this sort of deliberative process. Articles are published and conferences held. Hypotheses are tested, findings are argued over; some survive the scrutiny better than others. (Silver 2012: p. 383, emphasis in the original)

Scientific competition can be understood as a form of Hayekian rivalrous competition (Hayek 1946; 1968; Kirzner 1985; 1997; O'Driscoll & Rizzo 1985: chapter 6): an out-of-equilibrium situation in which the agents involved try to discover new opportunities for profit, which have not yet been noticed by others. In the case of science, the “profit” is mainly in terms of increased prestige (although money is not entirely irrelevant) (Levy 1988).

The opportunities are the new ideas that can be pursued, either new theoretical developments or new empirical strategies. Polanyi (1962) noted that “the decisions of a

scientist choosing a problem and pursuing it to the exclusion of other possible avenues of inquiry may be said to have an economic character”, in the sense that “his decisions are designed to produce the highest possible result by the use of a limited stock of intellectual and material resources”. In this sense we can indeed say that scientists are entrepreneurial (Stephan and Levin 1996).

What makes science an unusual entrepreneurial endeavour is that the “clients” of the service that one is providing are the same as one’s competitors. This matter is linked to the consensus building process. On a market, such consensus is not necessary precisely because suppliers and buyers are separate, and thus buyers can act independently on their preferences and sellers can independently satisfy this variety of demands. By contrast, in science (in a particular field) everyone is a producer and a consumer of the same product. This is extreme example of *coproduction* (Parks et al. 1981; Aligica & Tarko 2013). The key insight of the theory of coproduction is that when producers have a vested interest in the product (because they are also consumers) they tend to create and enforce rules against shirking in a self-governing fashion. Unlike the case of team production (Alchian & Demsetz 1972), when an outside monitor, who is the residual claimant of the product, is needed, in case of coproduction the monitoring and incentivizing mechanisms tend to emerge endogenously. Because science presents us with a case of coproduction rather than team production, we can thus expect that such self-organizing governance mechanisms will occur endogenously. Let us briefly note some of the mechanisms that have been created in this regard.

2.1 Prestige

The recent economics of science literature has generally emphasized that in science, the problem of free-riding and shirking is addressed, at least to some extent, by the incentives created by prestige and by the “publish or perish” constraint.

Consider first the role and the limits of prestige. Scientists face a free-riding problem on other scientists’ attempts to find the truth because prestige (and sometimes other rewards as well) are shared. One way to deal with the free-riding generated by such spillover effects is by restricting prestige sharing, by means of a “winner takes it all” approach (Stephan 1996). This is obvious especially with respect to prizes, when secondary authors (or sometimes even main authors like Rosalind Franklin in biology or Gordon Tullock in economics) get a lot less attention and less of a reputation boost than those who receive the prizes. The “winner takes it all” increases competition, but it also has the downside of increasing the risk of not getting much of a reputation boost from your own work, thus creating an incentive for shirking. A system of optimal prestige sharing is thus difficult to create and enforce.

The difficulty of finding the optimum balance between competition and prestige sharing is partially addressed by the “publish or perish” system, which can be seen to approximate a piece-rate compensation prestige system (Miller 1992: chapter 5). This has the advantage of being an on-going system, providing a means of assessment at all times. The disadvantage is that it biases the system towards papers and away from book writing,

leaving book writing mainly to tenured professors. Some have noted (e.g. Boettke 2012), that a subject may be complicated enough that, at least for our current level of knowledge, it requires more extensive works. From this model, we see that the problem is not cultural, but institutional. As the scientific community has grown in size, a move towards papers is necessary in order to reduce free-riding by means of a more continuous monitoring process. Hence, the move towards papers is a natural consequence of the growth in size.

2.2 Signaling and the eccentricity of scientists

A further insight about the ways in which scientific communities prevent free-riding and stimulate the productivity of their members can be obtained by looking at similarities to religious communities. Iannaccone (1992) notes that “a person’s religious satisfaction depends on both his or her own inputs and those of others”, hence highlighting the same element of coproduction that is at the centre of science. This leads him to analyse essentially the same economic problem that is faced by science: “people with low levels of participation are tempted to free-ride off those with higher levels since, given the choice, people are better off in a group whose average level of participation is greater than their own”, and “even in a homogeneous group, opportunistic behaviour leads to an inefficient equilibrium with suboptimal participation, since individuals maximize personal welfare by ignoring the external benefits of their participation.”

Furthermore, Iannaccone notes that “[a]lthough it is theoretically possible for religious groups to overcome both problems through appropriate financing, such schemes are

rarely practical” because they would work “only if individual inputs can be accurately observed and appropriately rewarded”. As I have noted above, in case of science, such schemes, although exist, are also difficult to tweak very well. We should thus expect for additional mechanisms to be at play. How do religious communities deal with the fact that “the aspects of religious participation that confer external benefits (commitment, effort, enthusiasm, etc.) are intrinsically difficult to monitor”? Innaccone’s explanation is that the community may rely on signalling, asking members to perform some costly behaviours that hamper their participation in competing communities: “it may be possible to demand of members some salient, stigmatizing behaviour that inhibits participation or reduces productivity in alternative contexts”. This is because “[i]t is ... much easier to observe and penalize *mere involvement* in competing groups than it is to observe the *level* of involvement in those groups”.

This theory is in no way specific to religion. It is a much broader theory that applies to any situation in which (1) individual productivity is hard to observe and (2) production is done by means of coproduction (rather than team-production with a third-party residual claimant). As such, it applies to science as well. My suggestion is that this theory explains several aspects of science’s organization. As mentioned earlier, scientists are much more geographically mobile than non-scientists. This works into cutting off scientists from other possible social connections. Moreover, many scientific centres (e.g. Santa Fe, Max Plank Institute, etc.) are in the middle of nowhere. Second, and more importantly, it explains the labour structure of most scientific activities.

2.2 Resource allocation: “scientific merit” and social entrepreneurship

A larger coordination problem exists regarding the share of the total budget (in terms of both money and time) to be allocated to each line of research. There are many possible distributions of the available budget. What determines which one actually occurs? Given the polycentric nature of the scientific community, there is no central decision making body that decides how the allocation should be done. There are two main inter-related factors that determine the distribution: (1) the *success of research* along each of the available lines (what Polanyi 1962 calls “scientific merit”); and (2) the *social entrepreneurship* of various individuals and organizations managing to create focal points of research (Boettke & Coyne 2009).

The success of a particular line of research is generally very hard to predict in advance. It is precisely for this reason that polycentricity is important (Polanyi 1951; 1962); the only available mechanism for scientific progress is entrepreneurship at the individual and research group level. The individual agents assess the success of past research avenues and of the likely success of future research and invest money and time correspondingly. As Polanyi (1962) highlights, although we can point out to certain criteria for judging “scientific merit” of a particular line of research (criteria such as plausibility, accuracy, how consequential it is, how intrinsically interesting it is, and originality), these criteria have such a large subjective component that only a bottom-up process of aggregation can be trusted: “the pursuit of science by independent self-co-ordinated initiatives assures the most efficient possible organization of scientific progress” and “any authority which

would undertake to direct the work of the scientist centrally would bring the progress of science virtually to a standstill”. As such, the budget distribution is an *emergent quantity* resulting from the actions of individual agents and research funders (the next section details the consequences of having only a limited number of funding sources).

Boettke & Butos (2002) note that, in markets, such bottom-up coordination and resource allocation is done by means of the price system and the profit-and-loss mechanism. But where is the price system that guides resource allocation in science? And in the absence of a coordinating “currency”, can we really trust that resources are allocated efficiently? The polycentricity theory perspective is that one does *not* necessarily need a metaphorical equivalent of prices for a productive emergent order to occur; all that is required is that the over-arching system of rules and norms are as such that the private self-interest of individual agents is aligned with the social good, hence, setting up a productive “invisible hand” type process. In other words, we can see science as a very large scale barter society. This works for two reasons. First, the variety of exchanged “goods” (i.e. of specific pieces of scientific knowledge) is limited enough that the double coincidence of wants never poses a big problem. Second, because scientific knowledge is kept public and production is done as co-production, the exchange is not solely between separated individuals, but between each individual and the broader collective fund of existing knowledge. In our case, the norms of science align the individual scientists self-interest in terms of prestige and money with the common goal of the community (truth-seeking). As Smolin (2006: p. 307) put it: “At its finest, the scientific community takes advantage of

our best impulses and desires while protecting us from our worst. The community works in part by harnessing the arrogance and ambition we each in some degree bring to the search.”

The social entrepreneurship aspect of facilitating large-scale coordination is also important. Apart from the role played by certain individuals, the most prominent manifestations of this type of entrepreneurship are the profile of different scientific journals, the creation of scientific associations, and the practice of prizes. A journal, especially a more specialized one, is an attempt at creating a focal point for a particular line of research. How successful such an attempt proves to be depends on the impact it manages to have thanks to publishing widely cited papers. For example, the emergence of public choice and of constitutional political economy as fields of research was accompanied and facilitated by the creation of those respective journals (e.g. see Tullock’s 1991 historical account). The creation of scientific associations, organizing conferences and setting up mailing lists, also coordinates research in more obvious ways. The meetings provide opportunities for scientists to gather and discuss outside the more formal conversation hosted by journal papers, while the mailing lists often publicize job opportunities and help the practitioners of a particular line of research to spread through academia (“colonize” the mainstream).

With respect to prizes, when a scientist receives one, this isn’t just an act of recognition, but it also serves as a coordinating device within the community – it establishes that

something is part of the basic canon to which future research should primarily relate or draws attention to interesting new lines of work. Moreover, the recognition created by prizes lowers the costs for others in pursuing that line of research as relying on a recognized piece of research requires less justification than relying on less recognized research. The prizes also draw attention to certain lines of research *for the entire community to see*. For example, when Elinor Ostrom won the Nobel Prize in 2009 a substantial fraction of the economics community had not heard of her before (Levitt 2009), and, thus, the prize also acted as a coordinating signal.

3 Distortions of science

The analysis so far ignores two important matters: (1) the impact science has upon society at large both in terms of enabling technological progress and of challenging wide spread beliefs (such as religious or political beliefs); (2) the sources of funding for scientific research. These two factors affect both the institutional framework of science, and the directions in which scientific entrepreneurship manifests itself.

With respect to the first aspect, it's safe to say that Galileo's conflict with the Catholic Church is part of the foundational myths of modern science. A more recent example is the distortion of biology in the Soviet Union and China due to political reasons, generating massive losses in agriculture and contributing to the humanitarian disaster of the "Great Leap Forward" (Carroll 2006: chapter 9; Pollock 2006). The extreme nature of this example is useful for illustrating the problem of state interference with science in a

very clear form, keeping in mind that the problem also exists in milder forms in democratic societies (Mooney 2005; Berezow & Campbell 2012).

Noticing that, as they collectivized the agriculture, production was dropping, the Soviet leaders decided to solve the problem by technological means. Unfortunately, science in the Soviet Union was not free of political interference. Lysenko's discourse in 1935, cheered by Stalin himself, captured the atmosphere well: "Both within the scientific world and outside it, a class enemy is always an enemy, even if a scientist" (quoted by Carroll 2006: p. 223). Following a press campaign organized by *Pravda*, genetics ended up denounced as "bourgeois science", biology textbooks were changed, and numerous Soviet geneticists who refused to acknowledge the value of Lysenko's theory (such that a plant growing in the cold would have frost-resistance offspring) ended up in prisons. Nikolai Vavilov was one of them. He was the president of the Edinburgh International Genetics Congress in 1939 and was one of the most famed inter-war geneticists. In his Galileo moment before the Communist Party Central Committee he told them: "Lysenko's position not only runs counter to the group of Soviet geneticists, it runs counter to all of modern biology. ... In the guise of advanced science, we are advised to turn back essentially to obsolete views out of the first half or the middle of the nineteenth century. ... What we are defending is the result of tremendous creative work, of precise experiments, of Soviet and foreign practice." (quoted by Carroll 2006: p. 224). This speech was not a good idea. He was condemned for treason, sabotage, spying and counter-revolutionary activities in 1940, and died in prison in 1943 at the age of 55.

Vavilov was basically defending the ethics of science – the reliance on consensus, the necessity of an aspiring entrant like Lysenko to work his way as part of the community, and the international nature of the scientific community – while the Soviet distortion involved destroying the polycentric nature of the scientific community within the communist world by enforcing a top-down doctrine. It is this departure from the institutional framework of science, up until the 1970s, that explains the failure of biological science in USSR and China. We see this especially by comparing biology with physics (Pollock 2006: chapter 4). At first, physics was in a similar danger as biology, as quantum mechanics' acceptance of randomness as a fundamental aspect of reality was contrary to Marxist-Leninist views on “materialism”. However, Stalin was told that if he interferes with physics he will not get his atom bomb. This was more important to him than the efficiency of agriculture, so, unlike biology, physics was given a pass. The result was that, apart from Stalin getting his bomb, the physics community within USSR remained relatively free and connected to the scientific community at large (and made important contributions). The point is thus that Soviet physics prospered because the polycentric organization of the physics community and the norms of science were kept in place, while Soviet biology suffered because the community of biologists in the Soviet Union was subjected to centralized political control and the norms of science were overridden.

The second aspect of the problem is related to funding (Greenberg 2001). Some authors have written about the way in which funding can distort science as a consequence of

funding sources *wanting certain conclusions* (e.g. Krinsky 2004; Mooney 2005). In my view this is an issue of relatively minor importance as polycentricity and the prestige dynamics (Levy 1988) limit the impact that corrupted actors have on the system as a whole. The scandal and outrage associated with instances of corruption and falsehood in science showcase not only that these are exceptions to the rule, but also that the rule is taken very seriously. *The only factors that have an important distortionary impact on the content of science are those that significantly reduce polycentricity.*

This is why Smolin's (2006) discussion of funding issues is more interesting. He notes that a reduction of polycentricity occurred in high-energy physics due to the paucity of data sources: the high expense required for building particle accelerators (necessary for testing cutting edge physical theories) has led to a significant reduction in institutional diversity, which, in turn, has led towards a more status-driven research. High-status physicists, who have already invested a lot of time and effort in a particular theory which has seemed very promising a few decades ago (but less so now), act as gate-keepers for new students limiting the theoretical diversity that is pursued and promoted. Although they are not in a situation in which "people in good faith" all agree, nonetheless, at least in Smolin's opinion, the community currently does a poor job at promoting a sufficient level of scepticism and a wide-enough diversity of view-points and, as a result, it has stagnated for more than three decades (which is an unusually long period of stagnation from the perspective of the history of physics).

It is also interesting to note that in macroeconomics, the distorting process is similar, but worse. On one hand, it is expensive to create macroeconomic datasets and, thus, the sources are relatively few – a similar situation to that in high-energy physics. According to Silver (2012: p. 185), “[t]he government produces data on literally 45,000 economic indicators each year”, while “[p]rivate data providers track as many as *four million* statistics”, which, however, are mostly kept as private information (and are thus not part of science per se). On the other hand, the sources of most of this public data are governments *who have a vested interest in distorting it*. This makes the situation worse because, in case of macroeconomics, the rationale for gathering the data is often not scientific in nature, but pragmatic – the data is supposed to be useful as a tool for social and institutional design (Buchanan & Wagner 1978; Boettke 2012). For example, as The Economist (2011) has humorously noted, economists relying on the official statistics “ignore the biggest imbalance of all: the current-account surplus that planet Earth appears to run with extraterrestrials ... the world exported \$331 billion more than it imported in 2010, according to the IMF's World Economic Outlook ... the world ran a persistent current-account deficit for at least three decades until 2005. In 2001 the deficit was equivalent to 0.5% of global GDP, but by next year the IMF's forecasts imply that the surplus could hit a record 0.8% of GDP”. It is also important to bear in mind that different theoretical viewpoints alter the decisions about *what kinds of data* to gather in the first place.

Conclusions

Science works because it is a competitive polycentric ensemble of diverse research centres and scientific journals held together by an over-arching shared ethic: the reliance on consensus reached in the past as a background for current research, the transparency and public nature of scientific information, the emphasis of the diversity of viewpoints when “people of good faith” disagree, treating the diversity of viewpoints as a problem to be solved in the light of the end goal of reaching consensus, and relying on prestige to motivate individual actors. Scientific progress is the consequence of the fact that consensus is valued, but no enforcement mechanisms of consensus are available due to the polycentric organization of the community. The polycentric nature of the system also prevents groupthink to persist or to be a significant problem for the community as a whole. Thus, consensus can be reached only by genuine scientific developments. The driver of the system is the competition between individual scientists, research centres and journals for gaining more prestige in the community. This competition for prestige creates the incentive to find weak spots in the existing consensus – i.e. to act entrepreneurial. This is why, following Feynman and Smolin, we can say that science is the organized scepticism in the reliability of expert opinion within the context of a search for consensus.

CHAPTER 3: POLYCENTRIC STAKEHOLDER ANALYSIS: CORPORATE GOVERNANCE AND CORPORATE SOCIAL RESPONSIBILITY UNDER VALUE HETEROGENEITY*

Introduction

What kind of theoretical frameworks should we use in order to best conceptualize, analyze and design stakeholders-based governance systems? Such a framework should accommodate the stakeholders' heterogeneity of preferences, beliefs and values, institutional diversity, and the complex nestedness of stakeholders' governance systems; it should be both realistic in capturing the imperfect rationality, information and potentially opportunistic behavior, while still preserving the key elements of the normative democratic ethos.

Stakeholders' governance systems should be able to cope with several difficult challenges: (1) Many situations of deep heterogeneity, (2) in which some form of "public" or "collective" value has to be created, (3) in a process satisfying some predetermined "democratic" standards. This means having to deal with (4) the

* Co-authored with Paul Dragos Aligica

aggregation and voting problems, in the context of (5) a complex, multiple levels, overlapping of institutional arrangement and arenas populated by diverse actors. This chapter advances a possible response to this daunting challenge by looking at the relevant political science literature, and adapting a relatively less known governance theory: the polycentric governance perspective developed by Vincent Ostrom in his public choice perspective on public administration (V. Ostrom, Tiebout, Warren, 1961; V. Ostrom, 1973; 1987; 1991; 1999; Wagner, 2005; Toonen, 2010; McGinnis & E. Ostrom, 2011), and further advanced by Nobel Prize in Economics co-recipient, Elinor Ostrom (E. Ostrom, 2005: chapter 9; 2010; Munger, 2010).

Polycentricity can be used both as a purely descriptive tool of stakeholder analysis, and as a normative perspective for improving stakeholders-based governance systems, in line with the democratic bent and aspirations of the standard stakeholder analysis literature. The polycentric perspective provides another approach to the problem of accounting for the voice of and interests of all stakeholders, by means of procedures with a strong support from the theory of democratic governance. Along those lines, we are proposing a new framework of analysis that we call “polycentric stakeholder analysis” (PSA), and we argue that the current discussions regarding stakeholders governance systems may benefit from incorporating the Ostromian perspective in multiple ways.

PSA offers a novel perspective on some of the key conceptual issues in stakeholder analysis, most importantly on how to identify the stakeholders and their salience for the

firm (Mitchell, Agle & Wood, 1997). But, unlike most of the literature on stakeholder analysis, which is primarily concerned with normative matters, PSA is first and foremost a purely descriptive tool of analysis. This is a direct consequence of embracing value heterogeneity. Once one accepts that multiple ethical perspectives can co-exist, and refuse to judge which is the “better” one, one automatically hampers one’s ability to offer ethical verdicts. We, thus, offer relatively little to the normative discussion about CSR. Our main interest is in, first, providing a positive description of how corporations actually act, which includes their numerous CSR activities, and, secondly, in providing a practical managerial tool or framework that corporations can use to improve their CSR practice. We explain the difficulties in evaluating the efficiency of CSR activities and the type of social processes and democratic procedures that may be used to alleviate some of those problems. In particular, we explain why, in order to provide efficient CSR, corporations need to move away from hierarchical models (which are probably most familiar to them) and adopt the perspective of co-production models of public value creation. Although the efficiency of CSR activities is hard (or impossible) to measure, we can provide broad theoretical reason for why using the co-production model is likely to lead to the best possible results.

The next section explains how PSA fits within the broader context of CSR theories, pointing out that it is both an individualistic theory and an “integrative” theory dealing with “complex emergence”. We show that it is actually possible to address all the concerns of “integrative” theories (Donaldson & Dunfee, 1994; 1999) without leaving the

individualistic, economic approach. Section, 2 explains why it is critical for CSR managers to take the heterogeneity of stakeholders at face value, and discusses the deficiencies, from this point of view, of non-polycentric, “integrative” but holistic approaches. Section 3 explains how to define the stakeholders without leaving the heterogeneity perspective; i.e. without adopting any homogenizing top-down assumption about presumably uniform societal norms. Section 4 provides a simple calculus of consent model of how to restrict the set of all possible stakeholders to only the group of “salient” stakeholders (Mitchell et al., 1997), thus solving the problem of how to allocate CSR resources efficiently. This is a notoriously difficult problem (Mahoney, 2006; Dunfee, 2008). Finally, section 5 describes the full polycentricity framework, identifying the key elements to which CSR managers need to pay attention.

1 The place of PSA within the context of CSR theories

Since Bowen (1953: xi) first asked “What responsibilities to society may businessmen reasonably be expected to assume?” the field of corporate social responsibility (CSR), as well as the diversity of views about CSR, have exploded (Mitchell et al., 1997; Garriga & Mele, 2004; Habisch et al., 2005; Windsor, 2006; Crane et al., 2008). In this chapter, we cannot hope to address this wide diversity, but we pursue instead a clearly circumscribed perspective. As Baron (2001: 12) succinctly put it, CSR “involves going beyond what the letter of the law requires or the market demands”. More specifically, we adopt Jones’s (1980: 59-60) two main defining assumptions.

First, we go along with the literature according to which CSR refers to responsibilities that corporations assume *voluntarily*, rather than as a result of being coerced by government policies (what is sometimes referred to as dCSR). Although this is not universally accepted (e.g. see Fox et al., 2002; Lydenberg, 2005; Moon & Vogel, 2008), it nonetheless seems to be the predominant point of view in the field, and it has been explicitly emphasized from an early stage (e.g. Walton, 1967). As Davis (1973: 313) put it, “social responsibility begins where the law ends. A firm is not social responsible if it merely complies with the minimum required of the law”. Most authors on which we rely in our account accept this assumption. Husted & Salazar (2006) distinguish between three types of CSR: strategic (as means to increase profits), altruistic (genuinely concerned with social benefits), and coerced (influenced by taxes and subsidies). We only include the first two in our discussion.

Secondly, we adopt the view that CSR is *more* than just a rhetorical and largely empty public relations device by which corporations secure higher profits (Eels & Walton, 1974; Carroll, 1979; Wood, 1991; Swanson, 1995; Harrison & Freeman, 1999; Carroll & Buchholtz, 2014). In other words, we take the view that “altruistic” CSR is real, and, hence, that there is something missing in Friedman’s famous critique of CSR, according to which the social responsibility of corporate officials is only “to make as much money as possible for their shareholders” (1962: 133). Apart from its normative content (according to Friedman no less than the very survival of the free society is at stake), his perspective also has problems as a purely positive description of actual corporate

behavior. For example, even in the early, 1970s most firms were engaged in activities such as minority hiring and training, ecological concerns, contributing to education and the arts, urban renewal and civil rights (Eilbirt & Parket, 1973: 11), and, more recently, the scope of CSR activities has expanded even more (Elington, 1998; Muirhead, 1999). As Mele (2008: 57) has noted, “it is hard to affirm that all practices of CSR are profitable”.

This being said, our proposal can still be seen as an example of a broader business case for CSR. Although firms generally operate in a competitive environment, this environment does not force them into a strategy of profit maximization (computed based on opportunity costs), but, instead only creates a weaker evolutionary pressure towards having positive accounting profits (Alchian, 1950). Authors like McWilliams & Siegel (2001) and Husted & Salazar (2006) have noted that firms engaged in CSR experience additional costs, and, hence, should be at a competitive disadvantage. As McWilliams & Siegel (2001: 124) have put it, “[t]o maximize profit, the firm should offer precisely that level of CSR for which the increased revenue (from increased demand) equals the higher cost (of using resources to provide CSR)”. But taking Alchian (1950) at face value, we can predict that McWilliams & Siegel (2001) model underestimates the level of CSR that firms can provide, and, indeed, according to the evidence (Mele, 2008), do in fact provide. This leaves more room for firms (especially large corporations) to pursue additional values apart from simply maximizing shareholders profits. This explains why, even under pure free markets, one should not expect CSR activities (going beyond profit

maximization) to be entirely weeded out by competitive pressures. Thus, the observation that corporations in fact engage in various CSR activities which don't help the bottom line should not be seen as a major puzzle. It is merely a consequence of the fact that real markets rarely fit the perfect competition model.

What about the normative angle? According to Friedman's critique, when a manager does anything which is not aimed towards maximizing profit "he is to act in some way that is not in the interest of his employers" (Friedman, 1970: 255). This, however, assumes that shareholders don't have any other values and interests apart from profit. In fact, they do, and the Alchianesque manner in which economic competition works leaves room for these additional values to be implemented and reflected in firms' activities. While it is true that principal-agent problems create difficulties for shareholders to fully control the managers (Miller, 1992; Salazar & Husted, 2008), the narrow profit maximization goal does not follow even if we abstract from this issue. This means that the business case for CSR needs to be understood in broader terms than merely that CSR helps increase monetary profit (Husted & Salazar, 2006).

According to the standard business case for CSR, firms may engage in CSR out of a variety of business reasons (this classification is inspired by Kurucz, Colbert & Wheeler, 2008):

(1) Shareholder business-case theories of CSR focus on *risk reduction* by (a) avoiding costly public relations disasters (Bowie & Dunfee, 2002), (b) facilitating marketing activities (Cornell & Shapiro, 1987; Pava & Krausz, 1996; Preston & O’Brannon, 1997), including by means of reputation-enhancing philanthropy (Frankel, 1998; Peattie, 1998; Crane, 2001), and (c) reducing the potential for costly managerial errors by getting managers out of their epistemic bubbles (Kedia & Kuntz, 1981; Lerner & Fryxell, 1988; Lankoski, 2000; Salzmänn et al., 2005).

(2) Stakeholder business-case theories of CSR focus on enhancing the firm’s *reputation and legitimacy* as a means to, on the demand side, (a) establish trust with potential customers and thus *expand their market share* (Barney & Hansen, 1994; Hill, 1995; Jones, 1995; Wicks et al., 1999; Kok et al., 2001; Godfrey, 2005; Storey & Price, 2006; Habish & Moon, 2006), and, on the supply side, (b) *attract talent* and increase workers’ productivity (Stigler, 1962; Riordan et al., 1997; Turban & Greening, 1997; Albinger & Freeman, 2000; Waddock et al., 2002) and (c) *secure supply chains* (Cashore, 2002).

(3) Social integration business-case theories of CSR focus on the idea that the profit of the corporation is the result of a win-win synergistic relationship with its broader social environment (Wheeler et al., 2003), for example as a result of *social learning* (Wadell, 2002) and by facilitating the discovery of its *competitive advantage* by engaging with the wider community. As Kurucz, Colbert & Wheeler (2008: 89) put it, “stakeholder

demands are viewed less as constraints on organization, and more as opportunities to be leveraged to the benefit of the firm”, for example discovering new opportunities for profit in developing countries (Prahalad & Hart, 2002; Prahalad, 2014).

Table 1: Typology of business-case theories for CSR (*italic* - existing theories; PSA - our proposal)

Locus of value	Individuals	Value communities	Integral commons
World view			
Reductionist	<i>Shareholder theories</i>	---	---
Pluralistic	---	<i>Stakeholder theories</i>	---
Complex emergence	Polycentric Stakeholder Analysis (PSA)	---	<i>Social integration theories</i>

Building on Wilber (1998; 2000), Kurucz, Colbert & Wheeler (2008: 103) propose a general typology of business cases for CSR by means of a two-dimensional graph plotting the *locus of value* (ranging from individuals and firms all the way to holistic “value communities” and “integral commons”) versus the *world view* or the type of social theory that is being used (ranging from simple individualistic and reductionist theories to integral theories of “complex emergence”). Table, 1 adapts this classification, illustrating

the location within the typology of the three perspectives identified above, and placing our own approach in the same conceptual context.

The aim of PSA is to capture the insights about the broad meaning and social relevance of corporate activities (specific to “social integration” CSR theories), but doing so while using the conceptual tools of the economist (hence our preferred terminology of “co-production” instead of “social integration”). In other words, we show that, properly understood, adopting the conceptual foundation of shareholder theories in terms of assuming that only individuals have values, does *not* lead to the extreme Friedmanite position. On the contrary, it leads to a deep appreciation of the broader business case for CSR. Unlike the existing elaborate business-case theories for CSR which rely on “value communities” and “integral commons”, i.e. on unrealistic assumptions of value homogeneity at the level of communities, societies or even the Earth as a whole, PSA starts from acknowledging the existence of deep value heterogeneity. We show that we can give a better account of corporate social integration by adopting this realistic assumption and using the theory of co-production.

Friedman (1970: 133) states that “the only one responsibility of business towards society is the maximization of profits for the stakeholders, within the legal framework and *the ethical custom of the country*” (emphasis added). The last part has sometimes been interpreted as a de facto admission of CSR (Husted & Salazar, 2006). However, when applying the idea to practice, Friedman (1970) left out the part about ethical customs. For

example, he stated that a corporation should not “make expenditures on reducing pollution beyond the amount that is in the best interests of the corporation *or that is required by law* in order to contribute to the social objective of improving the environment” (emphasis added). Mele (2008: 59) notes that Friedman’s perspective assumes a “full separation of the functions of the public and private spheres” according to which “the public good is pursued exclusively by public servants and politicians, but not by private businesses”.

Our proposal, following Ostrom’s institutional theories and her emphasis of the realm “beyond markets and state” (Ostrom, 2010; Ostrom et al., 2012) is naturally skeptical of such attempt at “full separation”. Moreover, the now robust literature on private governance (E. Ostrom, 1990; 2005; Cashore, 2002; Leeson, 2014; Stringham, forthcoming) shows that public issues are in fact often addressed by private actors and by private collective associations (such as clubs), rather than by governments. Large areas of activity are regulated by private means, such as reputation and private certification, rather than by states, and one cannot properly understand most economic activity without taking into account that the acting agents operate not only under externally provided constraints but also under internally assumed morals (Stringham, 2011). Hence, even without the emphasis and self-awareness brought about by CSR, private actors have long been engaged in social activities beyond the strict pursuit of monetary profit. To give just a simple and famous example, the lighthouse had long been held as an example of public good that could only be provided by government, but when Coase (1974) looked more

closely at how lighthouses had in fact been provided historically, he found that they were often constructed by private actors essentially engaged in CSR (earning benefits in terms of reputation, rather than directly in terms of money).

To put it differently, Friedman's "full separation of private and public spheres" hypothesis comes under attack not just from the communitarian perspective ("socialist", as Friedman has labeled it), but also from the direction of the self-governance and private governance literature. While the communitarian critique makes the normative case that corporations *should* care more about the broader social environment, the latter literature makes the positive case that corporations *can* deal more effectively than governments with a wide range of social issues, and they *in fact do so* when given the opportunity. As long as we understand CSR as voluntary, the larger the scope of viable CSR is, the smaller the role of coercive government becomes. In other words, opposite to Friedman's assumption that accepting a role for CSR beyond mere profit maximization leads to "socialism", we can see that the better voluntary CSR activities work, the *weaker* the case for government intervention becomes.

2 Stakeholders perspective requires a heterogeneity approach

One of the most important problems in generating human cooperation, a free, peaceful and productive social order has always been the fact that human individuals have a diversity of beliefs, values, identities, preferences and endowments (Sproule-Jones, Allen & Sabetti, 2008; Aligica, 2014; E. Ostrom & V. Ostrom, 2014). This "problem of agent

heterogeneity” is a key issue in the study of human cooperation, social action and social dilemmas.

Confronted with the problem, mainstream social sciences have generally opted for a strategy of “homogenization” by assumption: An important part of political theory, public choice and economics is based on (or emphasizes) a version or another of a “representative agent” approach. According to this approach, heterogeneity is a problem but, fortunately, we can find some deeper focal point hidden within this diversity, by averaging out the differences. In other words, general solutions transcending the differences of a heterogeneous social landscape are possible because diversity, at its most basic level, can be circumvented, uncovering a basic structure of social rules and laws that generates unity in diversity (and could promote the common good).

For example, Donaldson & Dunfee (1999: chapters 3 and 5), inspired by Waltzer’s (1987; 1992) idea of cross-societal norms, have proposed a process by which business ethics “hypernorms” could be identified. Donaldson & Dunfee’s (1994; 1999) “integrative social contracts theory” is holistic and sociological with normative concerns operating in a top-down fashion from society upon individuals and firms: “Relevant sociopolitical communities are a primary source of guidance concerning stakeholder obligations of organizations formed or operating within their boundaries” (250), and “managers can obtain useful guidance concerning the resolution of difficult stakeholder questions” by “reference to community authentic norms” (Donaldson & Dunfee, 1999:

252). This is a more elaborate version of Friedman's reference to "the ethical custom of the country" that we have mentioned earlier.

By contrast, building on Aligica & Tarko's (2013) work on value heterogeneity, our PSA approach preserves individual-level heterogeneity, and we think about the process by which "sociopolitical communities" are formed. This process, and the entire discussion about normative matters, operates in a bottom-up fashion, from individuals towards overlapping collectivities of values (rather than towards a homogenized "society"). Such communities cannot just be pre-supposed. Complex issues of social entrepreneurship are often involved in building them (Boettke & Coyne, 2009a,b). Moreover, one has to ask, who is to decide which community norms are "authentic"? Doesn't this just open the door for a convenient rhetorical strategy by which one can easily rationalize ignoring all those with whom s/he disagrees? Donaldson & Dunfee's analysis, thus, leaves out some of the very key problems that need to be addressed by a theory of stakeholder analysis. It would be a mistake for managers to go by ignoring salient stakeholders simply because they have been labeled "inauthentic".

The homogenizing strategy is ultimately deeply unsatisfactory. The empirical and practical presence of persistent and widespread heterogeneity reminds us that this strategy is the easy way out of a real and important challenge with significant practical implications. What happens when the representative agent approach is not viable? What happens when "consensus" does not exist (Riker, 1982)? Is social cooperation and

governance still possible between individuals who don't entirely share the same beliefs, values, ideas, and identities (V. Ostrom, 1997; Aligica & Tarko, 2013)? How can we account for broad "social integration" theories of CSR *without* assuming away the diversity of normative perspectives? The key claim is, thus, that the homogenization of various beliefs or objectives of the social actors is *not* always a key precondition to governance and institutional order. As Rescher (1993) put it, management "need not root in agreement – and not even in a second-order agreement in the processes for solving first-order conflicts – as long as the mechanisms in place are ones that people are prepared (for however variant and discordant reasons) to allow to operate in the resolution of communal problems".

These are not only important theoretical questions of political economy and institutional and governance theory. They are also important for any stakeholder theory. As Jensen (2002) has argued, managers cannot maximize more than one objective function. This has led him to propose the "Enlightened Stakeholder Theory" according to which "the objective function of the firm is to maximize the long-term firm value" (2002: 246). This view expands Milton Friedman's perspective to some extent, but not enough to fully account for how corporations in fact behave (Mahoney, 2006; Dunfee, 2008). As Dunfee (2008: 351) has noted, "a better way to view the Friedman-Jensen arguments is that they are just that, arguments about a way they would prefer to see the world structured. But that is not the world that we live in. Nor is it likely that most citizens would prefer to live in." This gets at the core of the issue: To a large extent, the debates about CSR have been

conflicts of vision based on divergent moral view-points. But to provide a *positive* account of the world of CSR as a whole, one needs to go beyond one's own preferred point of view, and acknowledge the full diversity of views.

Moreover, and most importantly, stakeholder's governance is, most of the time, governance in conditions of heterogeneity. Even if each given manager has a preferred personal view about the proper scope of CSR, they, nonetheless, have to face the fact that their stakeholders may have widely divergent views and expectations. This divergence of expectations needs to be included in the analysis. The question, then, is what are the mechanisms and processes that should be highlighted and used in such circumstances? As Mahoney (2006: 4) has noted, the "question of how the economic surplus generated by the firm is, or should be, allocated among the various *stakeholders* has been given little research attention". The situation has not improved much since. In our view, one key reason for this state of affairs is that existing CSR theories, as highlighted by the Table 1 typology, cannot properly deal with the issue of heterogeneity, and hence, cannot overcome the limitations of Jensen's single objective function maximization. By contrast, as expanded in the next sections, PSA is designed to provide a possible solution, by modeling CSR decisions as democratic co-production procedures (Aligica & Tarko, 2013), rather than as simple mathematical optimization problems.

In this approach, we follow Dunfee's (2008) suggestion.² Echoing Mahoney (2006), he noted that although "[m]anagers are seen as having a large zone of discretion in designating stakeholders as beneficiaries of social investment", nonetheless, "stakeholder theory, at least in its present state of development, fails to provide fine-grained help concerning how managers should cope with the allocation problem when making social investments" (2008: 361). One of the main stumbling blocks is the absence of a proper procedure for determining "stakeholder salience" (Mitchell et al., 1997). Dunfee's (2008: 361) suggestion is to frame this problem "as a market-like phenomenon involving needy stakeholders competing for assistance from potential suppliers of social goods, including corporations".

The main difficulty in following this suggestion is the fact that market-like emergent orders *without* prices operating as the coordination catalyst are not guaranteed to produce efficient outcomes and lack any obvious driver towards the efficient allocation of resources. As Dunfee (2008: 359) notes, as far as CSR is concerned, "there is no simple demand and supply mechanism". Even with prices, well-known market failures exist, but, without prices to facilitate productive coordination, the failures of emergent orders can be even worse. To put it differently, entrepreneurship in non-market settings is not always productive, but it can often be wasteful or even destructive (Kirzner, 1985; Baumol, 1996; Boettke & Leeson, 2009; Boettke & Coyne, 2009a,b). Social and political

² We agree with his diagnostic, while obviously disagreeing with the homogenizing approach of Donaldson & Dunfee's (1994; 1999) "integrative social contracts theory" that we have criticized earlier.

entrepreneurship typically suffer from the problem of lacking objective metrics of efficiency that would play the analogous role that (positive accounting) profits play in guiding firms' actions in competitive markets. Nonetheless, developing in close conjunction with Ostrom's institutionalism, we do have an incipient theory of productive entrepreneurship in non-market setting, known as "public entrepreneurship" (Oakerson & Parks, 1988; Klein et al., 2010). The theory of polycentricity has also developed as a direct attempt to answer this same challenge of understanding non-market (but market-like) mechanisms for building productive social orders (V. Ostrom, 1991; 1999; Aligica & Boettke, 2008; Aligica & Tarko, 2012; E. Ostrom, 2014). Both the theory of public entrepreneurship and the theory of polycentricity have developed especially with respect to the political realm, but their main ideas can be easily imported into the field of CSR as well. Our proposal for "polycentric stakeholder analysis" can thus also be understood as a public entrepreneurship CSR theory.

Dunfee's (2008) suggestion to search for a "market-like phenomenon" to coordinate CSR activities is thus still useful for laying out the agenda and highlighting the tasks that a theory of public entrepreneurship applied to the realm of CSR would have to perform. He laid out a few key questions:

(1) How can a corporation "align their social investments with their comparative advantages in providing social goods"? (Dunfee, 2008: 361). Sometimes this is obvious. For example, Wal-Mart providing help after hurricane Katrina, delivering "truckloads of

supplies, including free prescription drugs”, was an obvious extension of their usual comparative advantage (Horwitz, 2009). But the answer to this question is less obvious on most occasions. Generally speaking, CSR “[c]ompetencies may lie in intellectual property, or proximity, or ability to distribute, or in special knowledge of employees” (Dunfee, 2008: 355).

(2) How can a corporation “treat social investments in a manner similar to their financial investments by specifying social goals and objectives and then evaluating their investments to make sure that the goals and objectives are realized”? (Dunfee, 2008: 361). This is precisely the challenge that the theory of public entrepreneurship has been designed to address. How can such an evaluation occur in the absence of prices as mechanisms for social coordination?

(3) How can corporations “be completely transparent in all dimensions of dCSR”? (Dunfee, 2008: 361). Because CSR usually refers to providing various public goods, allowing “outsiders, including relevant stakeholders and their representatives, [to] render independent judgments concerning whether the firm is achieving its [CSR] goals”, and providing “other potential corporate suppliers ... the information to better inform their own decisions” can increase the system-level efficiency. But this goes against the regular practice of competitive economic activities when secrecy plays an important role. So, while two firms may be competitors in their regular activities, they may be natural

cooperators in their CSR activities. How will they manage questions about secrecy and patents?

While PSA will not provide a ready-made recipe for answering such questions, after all these are genuinely hard questions and we can expect at least some context specificity with respect to the proper answers, it offers a framework of analysis designed to facilitate CSR decision making. The PSA framework (laid out in more detail in section 5) rather than providing one-size-fits-all purported solution to CSR management, it provides a broader approach which can help managers recognize the diversity of CSR problems and design specific solutions and different methods of stakeholder involvement.

3 Public Value: its nature and creation

Once we accept that CSR involves more than just a roundabout method of increasing profits, and that firms can aim to create value not just for shareholders, but also for a wider range of stakeholders (as a result of shareholders' "altruism", to use Husted & Salazar [2006] terminology), we are led to an inquiry about the nature of "public value" creation. In other words, we are led into a different and very extensive literature which is in itself almost an entire sub-field of inquiry in political science (Moore, 1995; Bozeman, 2002; 2007; Jorgensen & Bozeman, 2007). In what follows, we rely on a simplified account, which has been specifically designed for the theory of polycentricity (Aligica & Tarko, 2013). Our contribution here is less foundational or theoretical, and more applied. This section shows how to apply the polycentric theory of public value creation to the problem of stakeholder analysis.

The economic analysis of “public values” starts from a somewhat peculiar meta-ethics, namely the conceptualization of moral values as special cases of preferences. In Aligica & Tarko’s (2013) account, moral values are “[p]references about other people’s behavior that one wants everyone else to have as well” (729). These are not the only kind of possible preferences about other people’s behaviors. Voluntary agreements, such as contracts or clubs, also specify how others should behave, but, unlike moral values, if the other person disagrees or refuses to comply, one simply accepts this as a fact of life (“de gustibus non est disputandum”) and tries to find other willing participants. By contrast, moral values determine people to desire that everyone else complies with their values. The game theoretical analysis of how norms persist and spread provides the background explanation for this definition. As shown by Axelrod (1986), for a norm to persist, agents need to (a) comply with it, (b) punish those who don’t comply with the norm, and, furthermore, (c) punish those who don’t punish. In other words, norms reflect a preference about others’ behavior *plus* a meta-preference that everyone has that same preference (and acts on it).

This theory dovetails with Michael Walzer’s (1987; 1992) account of “moral minimalism” that has influenced much of the “social integration” CSR literature. Moral values can be seen as “preference minimalism”, reflecting a limit to “de gustibus non est disputandum” when it comes to other people’s behaviors. When it comes to other people’s behaviors not *everything* can be allowed; moral relativism has a limit. However,

unlike the “social integration” accounts, the economic account of “public values” remains at the individual level, and it is compatible with the persistence of irreducible heterogeneity of values. This is important because, while Walzer’s “moral minimalism” may be correct (one can argue that we indeed have “sets of standards to which all societies can be held ... rules against murder, deceit, torture, oppression, and tyranny” [Walzer, 1992]), Donald & Dunfee’s (1999) “hypernorms” for business ethics are much more evasive and controversial. In our view, stakeholder analysis should be performed under the working assumption that no such hypernorms exist. (See also Douglas [2000] for another critique of hypernorms and “integrative” theory.)

Once we understand “public values” as instances of preferences, we can pursue an individual-level analysis. Aligica & Tarko (2013) note that, in order to account for value heterogeneity, one needs to look at the *diversity of evaluators* who may not only have (a) different values and different “aspiration levels” for these values (which determine their wiliness to compromise), but also (b) different epistemic perspectives on the observed system (e.g. using different categories to systematize and understand the world) and different evaluation criteria for the state of affairs (what variables are considered relevant, and estimated or measured). Consequently, the activities of a firm may be understood in different ways by different stakeholders (who attach different meanings to various acts), and evaluated based on a variety of ethical criteria.

This allows us provide a different perspective to defining who the stakeholders are, and of identifying their “salience” for a firm’s CSR (Mitchell et al., 1997; Dunfee, 2008). According to the PSA perspective, *the stakeholders are the evaluators of the firm’s activity (and only these evaluators), and the salience of stakeholders is determined by the distance between the shareholders’ own perspective (both normative and epistemic) and the stakeholder’s perspective.* According to this account, someone who does not evaluate the firm’s activity is not a stakeholder, even if they are beneficiaries. Such beneficiaries who are not evaluators can enter the CSR picture only because other stakeholders care about them. For example, a firm that provides relief for the homeless has a host of stakeholders who care and evaluate the firm’s activity in this regard (including those who are effectively involved in providing the relief), but many of the homeless themselves may be simply passive recipients. Many forms of aid and philanthropy are in the same situations. The logic behind excluding passive beneficiaries from the set of stakeholders is that, by not being evaluators, their actions are never directed towards changing the managerial decisions (either CSR decisions or normal business decisions). Managerial decisions may change as a result of information updates *about* such passive beneficiaries, but not as a result of *their* deliberate actions.

Furthermore, because PSA is a *business-case* theory of CSR, albeit a broad one, the salience of stakeholders (i.e. how much their opinions matter for managerial decisions) is ultimately determined by their correspondence with the views and desiderata of managers and shareholders. For example, anti-Wal-Mart protesters are unlikely to be among Wal-

Mart's prominent stakeholders, despite the fact that they are clearly evaluating Wal-Mart's activities. To the extent that stakeholders with very different perspectives from the shareholders have an elevated salience, this is only in an indirect manner – because other shareholders, who have high salience, care about not upsetting them. This includes sheer monetary profit reasons, but there is no reason to limit it to just monetary profit reasons. Let us compare this to standard stakeholder theory, as synthesized by Dunfee (2008). According to him, a stakeholder is “(1) anyone whom relevant laws and norms require be recognized as a stakeholder, (2) anyone whom hypernorms require be recognized as a stakeholder, and (3) anyone whom the managers of the organization determine, acting consistently with organizational values, to have a legitimate need which can be ameliorated through the use of the core competencies of the corporation” (355). As we have been arguing, the first two identification criteria are problematic. The first one presupposes homogeneity of values, and the second one refers to “hypernorms” which may not even exist. In a sense, these first two criteria put the cart before the horse because, in practice, communities united by certain norms emerge via a social entrepreneurship process (Boettke & Coyne, 2009a), and the firm's CSR may actually be one of the key factors helping this social entrepreneurship process. In other words, social responsibilities are not necessarily externally imposed upon the firm. They may either arise from the firm itself or the firm may be a key necessary ingredient in the formation of various communities of interests. For example, in the absence of firms' capacity to address certain needs (or perception about their presumed capacity), the community of people raising awareness about those needs may not emerge.

Dunfee's third identification criterion is similar to the PSA criterion given above, and it also includes a reference to the salience of the stakeholders (the reference to "legitimate needs" and to the ability to ameliorate them). There is however a subtle difference between the two perspectives. The PSA perspective does not determine stakeholders as a result of a *conscious decision* on the part of the firm's managers. Consequently, it allows for the possibility that managers *make mistakes* about properly or fully identifying the set of stakeholders. This is analogous to the normal case of a firm making errors about the actual demand for its products. Dunfee accounts for the possibility of managerial error by means of his first two criteria, but once we adopt a thorough individual-level perspective these criteria are problematic. Hence, PSA succeeds in capturing within the individual-level perspective the concerns addressed by the reference to norms, but also, on top of this, manages to preserve the heterogeneity of values. In the PSA perspective, managers try to identify all the salient stakeholders – i.e. all those who will evaluate the firm's activities, and who have a close enough affinity to the firm's shareholders that dismissing them would amount to failing to properly serve shareholders broad values (including their "altruistic" desires).

For example, while Chick-Fil-A may not count pro-gay protesters among its salient stakeholders, the Mozilla Foundation does – hence their diametrically opposed reactions to a very similar event. When one of their COO/CEO described their opposition to same-sex-marriage, protests and boycotts ensuing, Mozilla's CEO resigned almost

immediately, which did not happen in the case of Chick-Fil-A.³ Note that PSA allows us to analyze this divergence and the behavior of the two companies (and of their stakeholders) without assuming any particular prevailing ethical norm about acceptance or rejection of same-sex marriage. In fact, the existence of value heterogeneity in this regard may have contributed to what may be seen as an error made by Mozilla in properly managing its relation with their salient stakeholders. Indeed, as soon as Brendan Eich became CEO, three of Mozilla's directors resigned, and later on a large scale boycott against the Firefox browser determined Eich's resignation.

The next section delves more deeply into the issue of stakeholder salience, and provides a systematic way by which we can conceptualize CSR efficiency. Section 5 then provides the fuller framework of analysis about how to consider the salient stakeholders.

4 A calculus of consent strategy for estimating CSR efficiency

The claim that the stakeholders system relationships and governance should stay as close as possible to the democratic standards is a key idea pervasive throughout the stakeholder analysis literature and CSR more broadly. Ideally, one may say that a stakeholders' governance system should be democratic. Its legitimacy and efficiency may hinge on this. Democracy may be seen as an attitude, culture, way of life, set of values etc. but ultimately, it is about collective decision making and preference aggregation (Popper, 1960; Buchanan & Tullock, 1962; Dryzek, 2000; Knight & Johnson, 2001; 2007; 2011;

³ For a summary, see the Wikipedia accounts of the two issues:
http://en.wikipedia.org/wiki/Chick-fil-A_same-sex_marriage_controversy
http://en.wikipedia.org/wiki/Brendan_Eich#CEO_appointment_and_resignation

Held, 2007). Usually, this insight is related to the twin notions of control and legitimacy. First, democracy is a mechanism for generating, operating and controlling power and authority, via a set of voting arrangements. Second, majoritarian control and preference aggregation is the major source and determinant of legitimacy. The aggregative model of democracy thus links in a coherent framework the key themes of preference aggregation, control, authority, and legitimacy.

Seen in this light, the problem of democracy (including in stakeholders's systems) appears deceptively simple. This simplicity evaporates once we start looking at the details. First of all, there are multiple ways of preference revelation and multiple ways for a group to decide by voting (unanimity rule, first-preference majority rule, etc.). Each of these methods may lead to different final results (Arrow, 1951; Riker, 1982; Heap et al, 1992; Shepsle & Bonchek, 1997; Sen, 1999; Hartvisgen, 2008). Outcomes are, at minimum, sensitive to the rules used to aggregate opinions. In other words, what is a "majority" differs from one case to another, and it may depend on the collective decision-making institutions, as much as they depend on the preferences of the members of the group. Thus, "combining individual preferences into group choice by majority rule or some other method is not a straightforward undertaking" (Shepsle & Bonchek, 1997), as it is contingent on institutions. There is "no magic wand that transforms this individual clarity about preferences into collective clarity" (Ibid.). And "when the group size is large, when individual preferences are heterogeneous or when there is a large number of alternatives for group members to consider" things become even more problematic.

We cannot fully account and counteract for such problems in our present account. We can, however, point to a simplified model that alleviates *some* of the key issues mentioned above, in particular the issue of homogenizing a heterogeneous group of stakeholders. We propose that a particular model of democracy, namely the “calculus of consent” model (Buchanan & Tullock, 1962), can be adapted to the problem of CSR management, and used to estimate efficiency. This model shows how CSR managers can give priority to some of their core salient stakeholders, even if they are a minority among their larger group of stakeholders.

Let us assume that, based on the PSA identification criterion discussed in the previous section, CSR managers can create an ordered list of stakeholders from the highest salient stakeholders to the lowest salient stakeholders. Mitchell et al. (1997) procedure (looking at power, legitimacy, and urgency) can also be alternatively used for the same purpose of ordering the list of stakeholders. The question is how far should the corporations’ CSR resources be spread out, and thinned out, from addressing the needs of the most salient stakeholders to the needs of the least salient? As Dunfee (2008: 357) pointed out, “[t]he stakeholder literature ... does not provide sufficient guidance for managers facing allocation issues”. Dunfee considers this problem to be so difficult that he is deeply skeptical that it could be addressed any time soon. The problems with any aggregation mechanism, highlighted by the social choice literature, give us some hints to how

difficult the problem indeed is. Nonetheless, despite Dunfee's skepticism, we *can* provide here a preliminary solution.

Once the stakeholders are ordered from the most salient to the least salient, we can look at the CSR costs of satisfying them. The more of them the corporation tries to consider, the bigger the cost. Hence, the CSR *scope costs function*, $S(n)$, is monotonously increasing as the number of stakeholders, n , is increased. By contrast, we can also consider the CSR *risk function*, $R(n)$, that would cover all three types of business cases for CSR mentioned in section 1, from simple risks associated to public relations disasters to more complex risks associated with reputation and legitimacy (e.g. the risk of failing to attract talent) and all the way to the most complex risks associated with social learning and the failure to pursue the CSR goals. This risk function is monotonously decreasing. The more stakeholders the corporation takes into consideration, the less likely it is to miss something important.

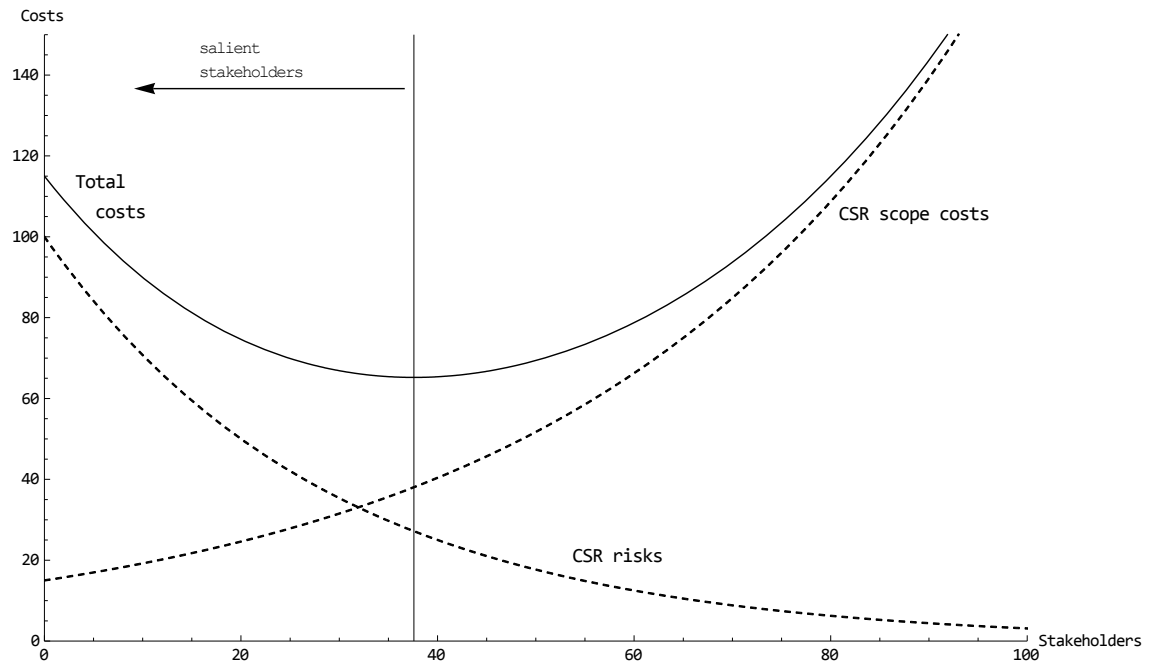


Figure 3: Calculus of consent model for determining CSR efficiency

If we put together these two costs, we obtain a graph like the one in figure 3. The minimum of the total costs determines the optimal spread of CSR activities, i.e. the set of salient stakeholders that the corporation should take into consideration. If the set of stakeholders is smaller than this, the CSR scope costs will be smaller, but the risk increase will disproportionately outweigh this reduction of scope costs. If, by contrast, the set of stakeholders is larger than this optimum, the risks will be even further diminished, but the increase in scope costs will make it not worth it. This optimal set of stakeholders determines whose opinions and values should matter for the CSR managers.

This is a similar economic logic (in terms of marginal costs and marginal benefits) to the one used by McWilliams & Siegel (2001) and Husted & Salazar (2006), but it is using a theory of *public* economics. McWilliams & Siegel (2001) and Husted & Salazar (2006) theorized CSR as if it were a private good, thus missing the democratic ethos at the heart of CSR.

We have thus provided a simple theory of CSR efficiency, which, at least in principle, solves the allocation problem and provides a guideline to CSR managers as to how to think about the range of stakeholders that they need to be considered. This, however, is only the beginning of the problem. The even more difficult part is, once having identified the salient stakeholders, to determine the system of rules and criteria that governs the actual CSR activities. The theory of polycentricity briefly discussed in the next section offers a further guideline for addressing this more difficult problem.

5 The PSA framework: A technical tool for CSR management

At first glance, refusing to take the heterogeneity of evaluators off the table makes the problem of CSR management impossibly complex. How can one possibly map out all the possible stakeholders, with their divergent perspectives on how to understand the world and how to judge firm activities? The homogenizing assumption had the advantage of simplifying the problem as there would be only one frame of reference. The idea of business ethics “hypernorms” shared across industries would simplify matters even more, offering the promise that firms could learn from each other’s CSRs even across different spheres of activity. The downside, however, is one of losing realism.

The previous section showed how to delineate the set of relevant (salient) stakeholders, but these stakeholders still form a heterogeneous group. Fortunately, the theory of polycentricity has been better systematized in recent years, allowing us to better deal with heterogeneity. This section explains how to turn this systematization into a practical tool or framework for CSR management.

Until recently, the literature on polycentricity has been a long string of various applications ranging from the analysis of the scientific community (Polanyi, 1951) to the study of common law (Fuller, 1978) to the analysis of federalism (V. Ostrom, 1987) and of metropolitan governance (McGinnis, 1999), and to the study of public economies more generally (V. Ostrom, 1999; E. Ostrom, 2005: chapter 9; 2010). Aligica & Tarko (2012) have looked at various types of systems that have been labeled “polycentric” and analyzed their key commonalities, as well as differences. According to their conclusion, the diversity of possible polycentric systems can be understood as laying on a foundation of three key common characteristics: (1) a multiplicity of autonomous “decision centers”; (2) the actions of these “decision centers” are circumscribed by an over-arching system of rules and/or norms, and (3) the content of this system of rules and norms is as such that it creates “incentive compatibility”, i.e. it aligns the incentives of individual actions with desirable social outcomes, thus setting the stage for a productive emergent order.

The multiplicity of autonomous “decision centers” is essential for maintaining creativity and dynamism, as well as the resilience of the system (E. Ostrom, 2010; Toonen, 2010; Aligica & Tarko, 2014). The diversity avoids groupthink and one-size-fits-all solutions, and also provides insurance against unexpected shocks, avoiding the situation of having the system as a whole affected in its entirety at the same time, as different centers have different vulnerabilities and, from case to case, can come to each other’s help. It is for such reasons that polycentric systems often outperform monocentric hierarchical systems, especially when the production of public goods is at stake. But it is the third aspect, which varies in its specific details from case to case, that connects the theory of polycentricity to the theory of public entrepreneurship mentioned earlier. What public entrepreneurs do is either discover and implement such over-arching rules or act as focal points for promoting good norms that create broad “incentive compatibility” for all the actors involved, and, hence, promote productive social orders.

In the context of our discussion, the firm’s stakeholders, who evaluate the firm, are the “autonomous decision centers”, and the CSR managers play the role of the public entrepreneurs who have to discover a system that promotes the desired social goal. This system can be understood as the set of over-arching rules and norms. For example, the CSR management usually has to decide what inclusion and exclusion rules to use, e.g. what types of criteria someone should fulfill in order to qualify as a salient stakeholder. Furthermore, an important idea is that, because of the nature of most social goals, the best outcomes are usually achieved when the stakeholders are involved in various ways in the

“production” process. This idea, that the consumer is a key part of the production process, is known as co-production and it is of fundamental importance for understanding the production of public goods (Parks et al, 1981; Brandsen & Pestoff, 2006; Oakerson & Parks, 2011; Brandsen, Pestoff, & Verchuere, 2012; Aligica & Tarko, 2013). The concept of co-production is the economic approach to the demands of “social integration” CSR theories. But the co-production theory is not holistic or sociological, but maintains its individual-level perspective and preserves heterogeneity. Hence, we argue, it provides an improved perspective in terms of realism.

We can also better understand now why CSR does not always come naturally to firms, but requires sometimes important changes in perspective and operation procedures. The idea of co-production is to a large extent at odds with the standard operation of most firms and corporations. The management system behind the delivery of most private goods can be understood as a system of team-production (Alchian & Demsetz, 1972; Miller, 1992). In case of team-production, the consumer is not part of the production process, and workers are not (necessarily) consumers of the product. But team-production and co-production systems are addressing the same managerial problem, namely they are systems for preventing shirking and free-riding in the production process, and, hence, they are easily confused (Aligica & Tarko, 2013). But, depending on the nature of the good that is being produced, it is crucial to properly identify the correct system of production. If we are dealing with a co-production problem, as it is often the case with social activities, but a hierarchical team-production system is put in place, the result will

be inefficient. This means that CSR practices often have to change their management system, and, in particular, involve the stakeholders in the decision-making process to a much larger extent than they are used to.

CSR activities can involve a wide variety of situations, and, hence, contrary to the idea of business ethics “hypernorms”, it is not advisable to propose one-size-fits-all recipes. The theory of polycentricity at the foundation of PSA is indeed broad enough to cover numerous different kinds of possible relationships between CSR management and stakeholders. The chart in figure 4 (adapted from the systematization of polycentric systems in chapter 1) illustrates the key elements that the CSR management needs to identify, and forms the backbone of the PSA framework.

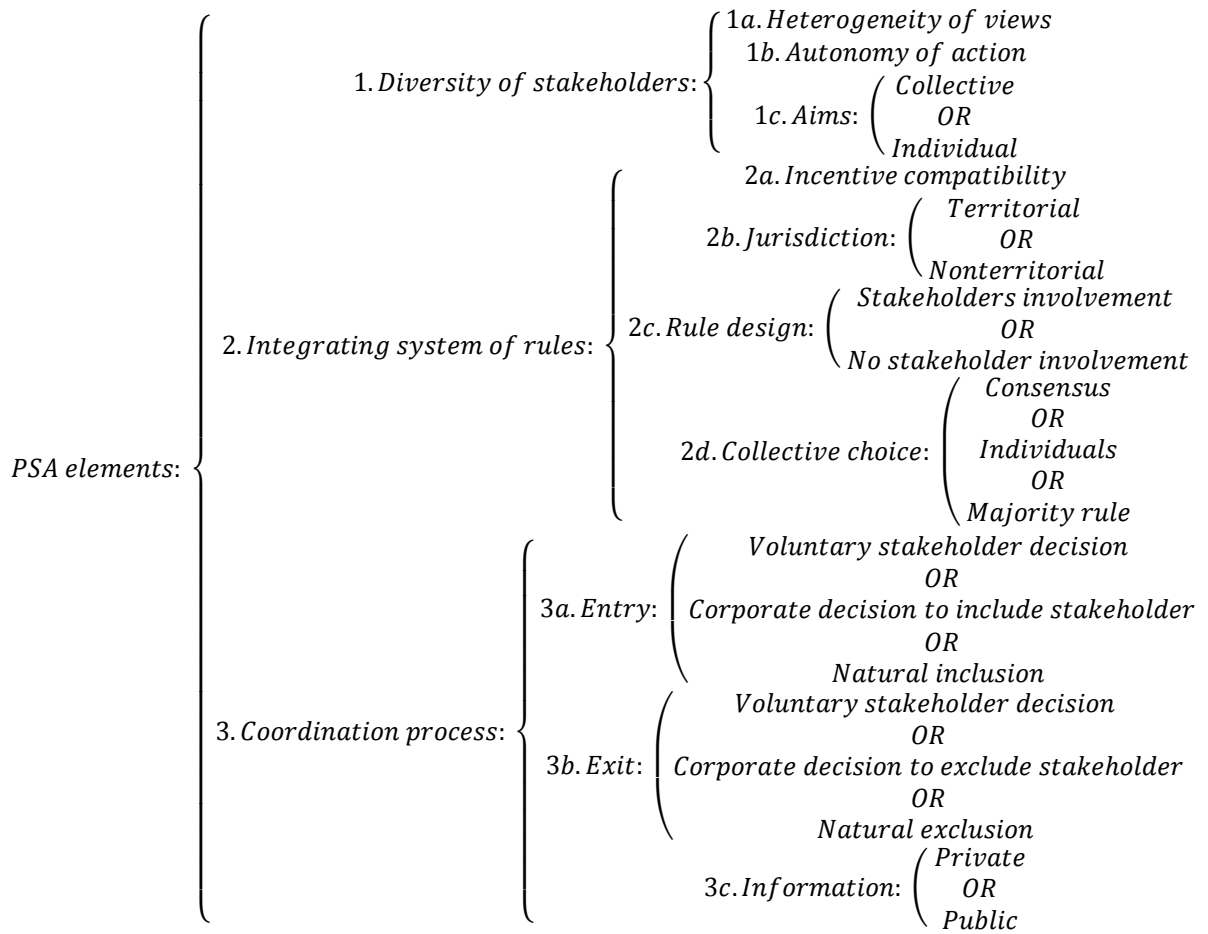


Figure 4: The PSA elements for CSR management

This chart highlights the key elements that CSR management needs to pay attention to. Some of those are not directives about how to do CSR, but guidelines about the type of problem that needs to be solved. Some of these elements are determined by the nature of the problem. For instance: (PSA: 1c) Are the stakeholders acting as disparate individuals

or as pre-organized collectivities of individuals with shared goals? (PSA: 2b) Is the problem territorially circumscribed? (PSA: 3a and 3b) Are stakeholders' entry and exit as salient stakeholders a matter of choice or of necessity?

But most elements involve key decisions by CSR management. (PSA: 2c) Depending on the importance of co-production, one needs to decide the level of involvement of stakeholders in the rule-design process, to put it differently, the level of paternalism of the CSR activity. (PSA: 2d) Considering that stakeholders' opinions and values may differ, is the achievement of CSR goals dependent of some form of aggregation (e.g. facilitating consensus forming or deciding by majority rule) or is it possible to achieve the CSR goals while interacting with stakeholders on an individual basis (i.e. some CSR goals require dealing with stakeholders on an individual basis)? (PSA: 3a and 3b) If entry and exit decision are taken by CSR managers, they need to decide (and face the possibility that they are mistaken) whether some stakeholders are not salient enough to be included. As Dunfee (2008: 353) put it, "because it is impossible for corporations to respond to all of the needs of their stakeholders ... [t]riage is required". (PSA: 3c) Finally, and again dovetailing on Dunfee's account, can the relevant information be made public? As Dunfee noted, there are often good reasons why sharing information contributes to CSR goals. But this is not always the case, even if we consider only the CSR goals. For example, sometimes one might want to take precautions to avoid groupthink, especially if empirical evaluation is not easily available.

Conclusion

What are the most effective ways of analyzing corporate agency and responsibility as part of complex, overlapping and competitive governance arrangements? What kind of theoretical frameworks should one use in order to best conceptualize, analyze and design stakeholders-based governance systems? Such frameworks have to satisfy at least three criteria: (a) They should capture and accommodate both descriptively and normatively the heterogeneity of preferences, objectives, beliefs and values of the stakeholders as well as the institutional diversity and the complex nestedness of the various governance systems embedding the stakeholders' system; (b) They should capture and analytically deal with the nature and implications of imperfect rationality, information and potential opportunistic behavior of the agents on the ground; and (c) They should be accommodating to the normative democratic ethos that pervades much of the corporate social responsibility (CSR) perspective.

This chapter has advanced a possible response to these challenges. Looking at the relevant institutional theory and political economy literature, the chapter has identified and introduced a relatively less known governance theory: The polycentric governance perspective developed by Nobel Prize in Economics co-recipient Elinor Ostrom, and by public choice political economy co-founder Vincent Ostrom. The chapter has argued that the current discussions regarding stakeholder governance systems (and more specifically the institutional analysis of corporate governance and CSR) may benefit from incorporating the Ostromian perspective in multiple ways. With this end in view, the

chapter articulated one possible approach to this task by showing how concepts such as “polycentricity” and “polycentric systems of governance” (a collection of heterogeneous decision centers acting independently, but under a common system of rules and/or norms limiting negative externalities and free riding) and “co-production” (situations in which consumers of good/service participate in the production process – in this case members of self-regulating communities co-producing the rules under which they operate) may be used to model and interpret the interactions between different stakeholders of a corporation, and the parameters and processes constraining or directing its activities. Polycentric Stakeholder Analysis can thus be seen both as an application of the Ostroms’ institutional theory perspective to a new domain and as a contribution to the literature regarding corporate social responsibility. The chapter extended the Ostroms’ institutional theory perspective by applying it to the domain of corporate governance and stakeholder analysis, illuminating how a framework based on it has the potential to satisfy the major descriptive and analytic criteria required by such a framework, while preserving the key elements of the normative democratic ethos that drives CSR more broadly.

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BIOGRAPHY

Vlad Tarko graduated from Gh Sincai College, Bucharest, Romania, in 1999. He received his Bachelor of Science from the Physics Department of Hyperion University in 2003, and his Master of Science from Physics Department of Bucharest University in 2005. He worked as a science journalist at Softpedia.com for a year and then for five years as a program coordinator and researcher at the Center for Institutional Analysis and Development. He earned a Masters of Arts from the Economics Department at George Mason University in 2013.