RIVALRY, POLYCENTRICISM, AND INSTITUTIONAL EVOLUTION

Peter J. Boettke and Rosolino A. Candela

ABSTRACT

We argue that the future of Austrian political economy rests on the study of how institutional entrepreneurs discover and implement alternative institutional arrangements conducive to economic growth. This requires a dual level of analysis in spontaneous order studies. How such institutional arrangements manifest themselves is ultimately an empirical question. As a progressive research program, Austrian political economy will entail cross-fertilization with other empirical branches of political economy that illustrate its own central theoretical contributions to political economy, namely economic calculation, entrepreneurship, and spontaneous order. Accordingly, we argue that such cross-fertilization with the work of Ronald Coase and Elinor Ostrom will further expound the institutional counterpart of "rivalry" in the market process, namely polycentricism and its empirical manifestation. Understanding the distinct relationship between rivalry and polycentricism will provide the central theoretical underpinning of institutional evolution.

Keywords: Legal institutions; James Buchanan; Ronald Coase; Elinor Ostrom; F.A Hayek; Austrian pfolitical economy

JEL classifications: K4; B3; B53; P51

New Thinking in Austrian Political Economy
Advances in Austrian Economics, Volume 19, 1–19

ISSN: 1529-2134/doi:10.1108/S1529-213420150000019001

> The diverse approaches of the intersecting "schools" must be the bases for conciliation, not conflict. We must marry the property-rights, law-and-economics, public-choice, Austrian-subjectivist approaches. Buchanan (1979, p. 7)

INTRODUCTION

Contemporary Austrian political economy is not a settled body of thought, but an evolving and progressive research program, emphasizing not only exchange but also the institutions within which exchange takes place. The Austrian School has emphasized a dual-analytic framework in understanding how the creative powers of a free civilization utilize dispersed knowledge of time toward realizing the gains from trade and innovation. We argue that as a progressive research program, the future of Austrian political economy will entail cross-fertilization with other empirical branches of political economy that illustrate and expound its own central theoretical contributions to political economy, namely economic calculation, entrepreneurship, and spontaneous order. This includes the application of spontaneous order analysis to the institutional framework itself, or in the parlance of James Buchanan and Elinor Ostrom, the constitutional level of analysis.

During the socialist calculation debate, Austrian economists Ludwig von Mises and F.A. Hayek contributed to understanding the central theoretical importance of institutions, such as private property rights, in providing the framework for rational economic calculation through competition, exchange, and discovery of contextual knowledge. Absent this institutional framework, economic growth and development will also be absent as "all production by lengthy and roundabout processes would be so many steps in the dark" (Mises, 1922 [2008], p. 117).

Buchanan – following up on the lessons learned in the social calculation debate – focused the economist's analytical attention on the importance of the framework. Hayek's work in the post-1950 period and such works at *The Constitution of Liberty* (1960) and *Law, Legislation and Liberty* (1973–1978) can also be interpreted as focused on the importance of the institutional framework. Buchanan, though, insisted as did Mises before him and Kirzner after, that the framework was provided exogenously. But Buchanan, differently than Mises and Kirzner, thought you could analyze the derivation of that framework separately through the tools of rational choice political philosophy – namely social contract theory. Coase and Ostrom built more from Hayek in this regard and saw the framework itself as an evolving and endogenous set of rules that emerge through the individual and group striving to minimize conflicts and realize gains from cooperation.

Whereas Buchanan drew our analytical attention to the constitutional level and provided an "economic" approach to the study of constitutional contract, he ultimately insists that rules must be treated parametrically; Coase and Ostrom treat the rules as variables that emerge within the playing of the social game itself. While Buchanan's work is the essential impetus for contemporary Austrian political economy, our emphasis in this paper will be on the implications for that work for a Coasean and Ostromian analysis of endogenous rule formation. Understanding the distinct relationship between rivalry and polycentricism will provide the central theoretical underpinning of institutional evolution. From this perspective, we understand the inefficiencies of a perfectly competitive world to be the future profit opportunities that entrepreneurs discover, not only within alternative institutional arrangements, but of the alternative institutional arrangements as well.

The paper will proceed as follows. "Economic Calculation & Its Institutional Implications" section provides an overview of the role of economic calculation in the Austrian theory of the market process and how that relates to institutional analysis. The next section describes the intersection of Austrian political economy with Ostromian and Coasean political economy in the study of institutions, institutional change, and endogenous rule formation. "Theory and History: The Role of Institutional Entrepreneurship in Spontaneous Order" section draws on the empirical research of Coase and Ostrom to illustrate how entrepreneurial individuals, specializing in the discovery of relevant institutional knowledge, have coped with collective action problems. "Conclusion" section concludes.

ECONOMIC CALCULATION AND ITS INSTITUTIONAL IMPLICATIONS

The main thesis of our paper can be understood fundamentally as an expansion of the insight Hayek made in his 1937 article "Economics and Knowledge." Hayek's main attempt in that paper was to establish the distinction between the pure logic of choice universally applicable to individual action and the applied logic of choice of individual interaction contingent to "external facts." That is, he asserted "that what was a priori was only the logic of individual action, but the moment you passed from this to the interaction of many people, you entered into the empirical field" (Hayek, 1994, p. 72).

What is a priori to economics is that individuals rationally choose in response to the additional benefits and costs they expect to receive from undertaking alternative courses of action. However, depending on the costs and benefits of certain choices, individuals a posteriori will interact differently to achieve their ends. Within a particular institutional framework, such costs and benefits are embodied in what Hayek referred to as "external facts." The process by which individuals come to know such external facts provides a solution to the knowledge problem:

> The wider aspect of the problem of knowledge with which I am concerned is the knowledge of the basic fact of how the different commodities can be obtained and used, that is, the general question of why the subjective data to the different persons correspond to the objective facts. (Hayek, 1948, pp. 51−52)

Hayek also pointed out that understanding the empirical realm of catallaxy, which the neoclassical paradigm of equilibrium analysis tautologically defined out of existence, requires that we understand "(a) the *conditions* under which this tendency is supposed to exist and (b) the nature and process by which individual knowledge is changed" (1948, p. 45). In the neoclassical world of general equilibrium, where entrepreneurship is absent, perfectly rational economic actors behave as Robbinsian maximizers, optimally producing quantity where price equals marginal cost and average cost is minimized. In the neoclassical sense, correct foresight, Hayek states, is "a precondition which must exist in order that equilibrium may be arrived at," not "the defining characteristic of a state of equilibrium" (1948, p. 42) emerging as a by-product of the market process. Without the entrepreneurial element of human action, such optimality conditions are not discovered through the equilibration of the market process, but exist as assumptions defining equilibrium since "potential opportunities for profit have all been mapped out clearly ahead of time" (Lavoie, 1985, p. 107).

Moreover, the absence of competition and entrepreneurship renders the neoclassical model of general equilibrium institutionally antiseptic. In the Austrian paradigm of the market process, the utilization of knowledge which is never given to society in its totality furthers the coordination of individual plans by utilizing "the knowledge of alternative possibilities of action of which he makes no direct use" (Hayek, 1948, p. 51). Knowledge of alternative possibilities of action, which emerges through the Austrian notion of equilibration, "presupposes a particular kind of institutional environment," (Lavoie, 1985, p. 113) namely a market economy based on exchangeable private property rights, in which price competition brings about the reduction of costs to a minimum discoverable. It is not that knowledge of the market is difficult to compile; it is that the knowledge would not exist independent of that context. On this point Hayek writes:

> What is forgotten is that the method which under given conditions is the cheapest is a thing that has to be discovered, and to be discovered anew, sometimes almost from day to day, by the entrepreneur, and that, in spite of the strong inducement, it is by no means regularly the established entrepreneur, the man in charge of the existing plant, who will discover the best method. The force which in a competitive society brings about the reduction of price to the lowest cost at which the quantity saleable at that cost can be produced is the opportunity for anybody who knows a cheaper method to come in at his own risk and to attract customers by underbidding the other producers. But, if prices are fixed by the authority, this method is excluded. (1948, p. 196)

Fundamentally, Austrian choice theory, or the abstract logic concerning the application of scarce means to achieve competing ends, "is seen as a tool for the study of social institutions" (Lavoie, 1985, p. 113). The central Austrian contribution to political economy is the theoretical understanding of economic calculation (Boettke, 1998), for which Mises and Hayek elaborated the conditions and process by which knowledge emerges. Economic calculation refers to the decision-making process about how to allocate scarce resources among the array of feasible technological alternatives. Mises argued that rational economic calculation would be impossible under socialism because "the significance of Money in a society where the means of production are State-controlled will be different from that which attaches to it in one where they are privately owned" (Mises, 1920 [2009], p. 92). Precisely because the abolition of private property under socialism would eliminate the institutions that underpin the market order, namely private property over the means of production, there would no market for the means of the production. Without a market in the means of production there would be no prices established on the market for the means of production. And without prices of the means of production there would be no way for economic actors to rationally calculate the alternative uses of these means of production (Boettke, 1998; Boettke, Coyne, Leeson, & Sautet, 2005, p. 284).

Moreover, the central underpinning of a market economy is economic rivalry or "the clash of human purposes" (Lavoie, 1985, p. 22). Rivalry is inherent to the pure logic of choice, but how rivalry manifests itself is institutionally contingent. Pertaining to the problem of economic calculation, Mises asserted that the specific form of rivalry necessary to discover how to apply scarce means to their most valued ends amidst the set of technologically feasible alternatives requires an institutional framework of private property, monetary prices, and profit/loss. More importantly, Lavoie states "Mises is not arguing that the price system offers the best among a variety of possible methods of allocating scarce goods of an advanced technological society. He is saying the price system is the only possible way" (Lavoie, 1985, p. 54).

However, how do individuals rationally calculate the institutional context for rational economic calculation itself? In other words, among the array of feasible alternative institutional arrangements, how do individuals discover those institutional arrangements that orient the coordination of the mutual adjustment of rivalrous ends? Answering this question will yield the institutional implications implicit to the arguments made by Mises and Hayek during the socialist calculation debate. Where Mises and Hayek offer this "theoretical photograph" about the institutional consequences of socialism, its "negative" informs us of the empirical institutional implications of a market order. Whereas in socialism, the logical conclusion of the effort to suppress rivalry is central planning, totalitarianism, and a monocentric order, in capitalism we find the opposite. That is, rivalry inherent to the pure logic of choice, when applied to the institutional framework of a market economy, manifests itself as a polycentric order. Aligica defines polycentricity as:

> A complex system of powers, incentives, rules, values, and individual attitudes, all combined in a complex system of relationships at different levels. One may detect very interesting dynamics at work. Market polycentricism seems to entail judicial polycentricism. Judicial polycentricism entails political polycentricism, and in its turn political polycentricism entails constitutional polycentricism. Accepting the existence of such a systematic logic, one may visualize the entire social system as defined by underlying current originating in pulsating polycentric domains. Polycentric order in one area entails and produces polycentricism in other areas. (2014, p. 51)

Fundamentally, the relationship between rivalry and polycentricism can be found in how social order emerges out of the interaction of individuals through exchange within the rules of the game and exchange over the rules of the game. Polycentricism corresponds to rivalry in the market process. Just as rivalry depends on competition, experimentation, and the communication of tacit and dispersed knowledge, so does polycentricism as a benchmark for the evaluation of comparative institutional arrangements.

Aligica summarizes the notion of polycentricity as having three basic features: (1) multiplicity of decision centers; (2) the institutional and cultural framework that provides the overarching system of rules; and (3) the spontaneous order generated by evolutionary competition between different decision centers' ideas, methods, and ways of experimentation (2014, p. 58). The fundamental aspect underlying these basic features of polycentricism is a built-in feedback mechanism for self-correction, calibration, and adjustment of institutions through the rivalry of competing and overlapping decision nodes within the institutional framework. Therefore, the division of knowledge within a polycentric market order will yield diverse and changing institutional arrangements, which adapt to orient and facilitate the mutual adjustment of the goals of rivalrous individuals possessing only bits of such particular and dispersed knowledge. From this perspective, "it is more appropriate to presume that policies *emerge* from multiple centers of authority than to presume that they are *made* by some single center of authority" (Ostrom, 1991, p. 17, italics original).

AUSTRIAN POLITICAL ECONOMY: COASE, OSTROM,[1] AND ENDOGENOUS RULE FORMATION

The intersection of Austrian political economy with Ostromian and Coasean political economy provides new insights into the study of institutions, institutional change, and endogenous rule formation. In this section we will elaborate on the complementarities of the Austrian School, the Bloomington School, and Coasean economics in the study of endogenous rule formation. The notion of rivalry central to the Austrian theory of market process runs analogous to the notion of polycentricism central to endogenous rule formation in the Bloomington School of the Ostroms. They each provide insights into the emergence of spontaneous order through the interaction of individuals.

The Austrian roots of endogenous rule formation can be traced back to Menger's invisible-hand theory on the origins of money. The relationship between economic rivalry and polycentricism can be found in Hayek's study of the emergence of law through spontaneous order. Appreciating Menger's earlier insights, Hayek recognized that the study of law, like any other social institutions, begins with "the discovery that there exists orderly structures which are the product of the actions of many men but are not the result of human design" (Hayek, 1973, p. 37). The role of the law that Hayek envisioned was part of the same spontaneous order that Adam Smith envisioned for markets.

Moreover, Hayek's study of law exemplifies the interaction between exchange over the rules of the game and exchange within the rules of the game, which Buchanan referred to as the "pre-constitutional" and "post-constitutional" level of analysis respectively, and the nested nature of rivalry between different polycentric systems. While recognizing the role of constitutions and codified laws in providing "the rules of the game," Hayek understood that such formal embodiments of law were derived from the accumulation of precedents that had evolved and adapted to the particularities of time and place. For example, in the English common law tradition or the Ancient Roman legal tradition the role of judges and lawyers is the articulation and implementation of those habits and customs which contesting parties already acknowledge as established practices.

From the standpoint of economic rivalry, the role of the judge under such legal traditions was to decide on the margin (Boettke & Candela, 2014). On this point, legal scholar Bruno Leoni states that judges "are concerned with the marginal fringe of the cases in which the conditions for the exchange of the actions are not clear, or not settled, or not agreed upon ex post facto," through which they discover new applications of the law based on past precedents. By referring to past precedents, "it is from that comparison that they are able to derive ultimately the ratio decidendi, regardless of the fact that they seem to discover it only in the precedents" (Masala, 2003, p. 228). When applied to the institutional level of polycentricism, "the judge in a commercial dispute can be seen as the connection between two polycentric systems: the market and the juridical system" (Aligica, 2014, p. 59), or the connection between the market process and the institutional framework within which the market process emerges.

The question then is the following: if the law itself can emerge endogenously, much like capital formation in a market economy through the mutual adjustment of diverse individual ends, then why cannot the mechanisms for its enforcement emerge endogenously as well? Stringham and Zywicki (2011) have argued that Hayek's and Leoni's rendition of the market and the law as discovery processes is not merely a semantic coincidence in their theory. If the market requires competition in order to utilize relevant information to correct errors in prices, then so does law as well. This observation is best expressed by Leoni in correspondence with Hayek after the latter's praise of Leoni's publication of *Freedom and the Law*:

> I think that the underlying idea of such a theory is that there is a market of the law as well as there is a market of goods. The rules correspond to the prices: they are the expression of the conditions requested for the exchange of actions and behaviours, just as the prices are the expression of certain conditions requested for the exchange of the goods. And the rules, as well as the prices are not imposed, but found out. I said before that the rules are found out by some special kind of people. But even this is true only

> partially. Everybody can find out a rule under given circumstances: this happens whenever people exchange their actions, their behaviours etc. at certain conditions without being compelled to consult anybody. (Masala, 2003, p. 228)[2]

Institutional solutions will be found in a marriage of empirical insights from Ostromian political economy consistent with Austrian praxeology into a blend of constitutional craftsmanship and spontaneous order. It is the notion of "constitutional craftsmanship" that is foundational to the work of Ostrom that provides the conciliatory link between the dual spontaneous order analysis argued for here and the restriction of spontaneous order analysis to the market process, argued notably by Buchanan and Kirzner (Boettke, 2014b).

Both Buchanan and Kirzner argued that absent the framework necessary for economic calculation, rivalry, and entrepreneurial action can manifest itself either through socially benign or socially harmful outcomes. This is a legitimate argument that political economists cannot ignore. But precisely because we live in a world where failed and weak states are not uncommon, "a better starting point for analysis than a world with only minor blemishes may be a world where nothing is enforceable, property and individual rights are totally insecure, and the enforcement apparatus for every contract must be derived from first principles – as in the world that Hobbes so vividly depicted" (Rajan, 2004, p. 57). That is, we cannot always assume a world in which institutional framework of well-defined property rights, the rule of law, and the enforcement of contracts is exogenously given.

Beginning from an analytic starting point in which the institutional framework of the market process is absent does not necessarily imply a Hobbesian form of anarchy. Rather, what is "far less recognized is that where property rights are insecure, entrepreneurship also thrives but at a different, 'higher tier' of economic activity" (Boettke & Leeson, 2009, p. 252). What must be recognized is the ubiquity of entrepreneurial human action on both levels of analysis, and that limits to the extent of the market provide profit opportunities to "truck, barter, and exchange" institutional arrangements to further expand the depth and breadth of potential Smithian gains from trade and specialization to be exhausted on the level of the market. Such entrepreneurial activity was most prevalent in the shortage economies of Eastern Europe and the former Soviet Union and continues today where black markets flourish in failed and weak states:

> In the unofficial economy productive-tier entrepreneurship flourishes. Black markets open a back door for this entrepreneurship by recreating incentives to invest in productive technologies. However, a significant obstacle remains. Where do individuals derive

> the security of their property against private predation needed to invest in these technologies? … The weakness, corruption, and unreliability of public protection technologies for securing individuals' property against private predation precludes citizens from relying on government for this purpose. This obstacle creates a profit opportunity for individuals who can devise institutions of private governance that protect others against the threat of private predation. "Institutional entrepreneurs" are the agents of these private protection technologies. (Boettke & Leeson, 2009, p. 255)

Moreover, while a dual-level analytic framework must always be employed by political economists to distinguish between rules and actions within those rules, it cannot be presumed that such rules are always given or based on reflection and choice of a "constitutional moment" in order to escape the nastiness, brutishness, and shortness of Hobbesian disorder (Boettke, 2014a, p. 120).

Although the institutional framework of rules may indeed embody explicitly articulated rules, such as the U.S. Constitution, like all formal rules, their legitimacy is contingent to their "stickiness" (Boettke, Coyne, & Leeson, 2008) or congruence to informal rules and customs that have tacitly emerged as a result of human action, though not of human design. Therefore, "constitutional rules emerge through action as well as through deliberate choice" (Wagner & Runst, 2011, p. 132).[3] Even Hayek himself succinctly clarifies this point:

> At the moment our concern must be to make clear that while the rules on which spontaneous order rests, may also be of spontaneous origin, this need not always be the case. Although undoubtedly an order originally formed itself spontaneously because the individuals followed rules which had not been deliberately made but had arisen spontaneously, people gradually learned to improve those rules; and it is at least conceivable that the formation of a spontaneous order relies entirely on rules that were deliberately made. (1973, p. 45)

Wagner and Runst further state three reasons why the formation of constitutional rules through both constructivism and spontaneous order are not inconsistent with each other. First, just as Hayek (1973) argues, individuals have survived only by living in groups that evolved just rules of conduct, a fact which can neither be analytically nor anthropologically refuted. Second, changes in the rules of the game to overcome dysfunctions and discords in the market process should not be regarded as purely an endogenous or exogenous process because "the distinction between selecting rules for a game and playing a game within those rules is a useful mental heuristic; however, the two types of activity occur simultaneously and not sequentially" (Wagner & Runst, 2011, p. 135).Third, since rivalry is part and parcel of human action and cannot be analytically separated from the rule-making process ex ante or ex post of the constitutional framework, the emergence of new rules tacitly through entrepreneurial discovery and the subsequent articulation and implementation of those rules are "entangled." They cannot be treated as two separate spheres of activity (Wagner & Runst, 2011, p. 135). The point to emphasize here is that human intentionality and deliberation is never fully absent from spontaneous order analysis (Boettke, 2012, p. 135) and implies that "design and spontaneous order are not irreconcilable. Design is possible (and takes place overwhelmingly) within the overarching rules and within the broader process of the ever-evolving spontaneous order" (Aligica, 2014, p. 50).

The Ostroms also made contributions to understanding Buchanan's dual-analytic framework by stressing the entangled nature of constructivism and spontaneous order in "constitutional craftsmanship." The ability of individuals to craft rules that are effective within their own communities hinges upon the mutually agreed-upon rules of governance that then establish reliable expectations among the community. Elinor Ostrom emphasized the legitimacy of rules as essential to minimizing the enforcement and monitoring costs of rules (Ostrom, 1990, p. 205). If rules are developed internally, by actors with local legitimacy and knowledge of the community's history, then monitoring can be a "natural by-product" of the system of rules (Ostrom, 1990, p. 96). Elinor Ostrom's interest in studying constitution making from the bottom-up was partially inspired by Buchanan's constitutional political economy agenda; she described his work as "an important stimulus for our extensive studies of how many diverse peoples around the world have been able to organize their own rules" (Ostrom, 2011, p. 372). These contributions to public choice can be seen as taking an Austrian and market-process approach to understanding federalism and local public economies.

Coasean economics, moreover, provides us a perspective of how to escape the "black box" to understand how institutional evolution emerges through the interaction between diverse polycentric systems, namely between markets and the institutions within which markets are structured. The relationship between rivalry and polycentricism are linked through the insights found in Coase's "The Nature of the Firm" (1937) and "The Problem of Social Cost" (1960). Coase's theory of the firm and the Coase theorem can be characterized as "'limit theorems' in that they demonstrate the pure logic of a situation as the starting point of analysis. In other words, they establish what the world is not so that we may get on to the task of explaining the world as it is" (Boettke, 1998 [2001], p. 67). In a zero transactions costs world, neither the notion of rivalry between entrepreneurs nor the polycentricism of the law would be relevant as the mutual adjustment of competing ends would be achieved through frictionless spot markets. However, precisely because there are transactions costs to utilizing the price system and negotiating conflicts, both institutions and firms emerge ex ante as guide posts for economic rivalry and ex post as a consequence of economic rivalry, respectively.

As firms coordinate the four factors of production in which land, labor, and capital are under the contractual authority of entrepreneurs, economic rivalry within firms and between firms will interact with the law as the "fifth factor of production" (Boettke & Candela, 2014) and unintentionally result in institutional evolution. Given the division of knowledge and labor, the diversity of skills and knowledge unique to each firm, and the heterogeneity of the factors of production, a combination of Coasean bargains will be generated unique to each circumstance, each manifesting themselves as different contractual arrangements. As such, the evolution of contractual arrangements within each firm will give rise to changes in the law to address that marginal fringe of cases in which conflict over the conditions for exchange between the owners of the factors of production is ambiguous. Such conflict gives rise to new articulations and implementations of the law based on past precedents and established customs and habits. The evolution of the law will then provide reliable expectations to resolve future conflicts and coordinate the diverse purposes of individual actors. This theoretical exposition of institutional evolution will be illustrated in empirical studies conducted by Ostrom and Coase in the next section.

THEORY AND HISTORY: THE ROLE OF INSTITUTIONAL ENTREPRENEURSHIP IN SPONTANEOUS ORDER

For Austrians, "identifying specific historical institutions is not the end of analysis, but only the beginning" (Lavoie, 1985, p. 113). In making efficiency claims about alternative institutional arrangements, the economist must evaluate how different institutional arrangements govern the process of exchange. On this point Coase argued "it makes little sense for economists to discuss the process of exchange without the institutional setting with which trading takes place, since this affects the incentives to produce and the costs of transacting" (Coase, 1992, p. 718). Questions about why nations are rich or poor, why some nations have successfully transitioned from socialism to the market, or more recently how the financial crisis occurred are all institutional in nature. As such, these questions demand institutional answers.

Aligica points out that the "problem of endogeneity in the emergence of rules, and the dynamics of discovery and choice in institution building and change are indeed an increasing preoccupation in current political and economic theory. The move is unavoidable once heterogeneity is recognized as a key feature of the social reality to be dealt with" (2014, p. 26). In other words, the heterogeneity of particularized knowledge and cultural values cannot be assumed away in the face of "social cleavages" (Buchanan & Tullock, 1962 [1999], p. 80) that plague the dysfunctional political economy of failed and weak states.

However, the brilliance of Ronald Coase and Elinor Ostrom was to illustrate how the heterogeneity and diversity of individuals are not only the source of problems and dysfunctions of institutional problems, but also the "ultimate resource" (Simon, 1996) of institutional solutions as well. As individuals utilize technologies, such as the price system, to coordinate dispersed and tacit knowledge and to eliminate uncertainty, the expansion of knowledge facilitated through such technology further increases the range of technological possibilities to achieve social cooperation. The use of knowledge in society creates solutions to old problems, which unintentionally leads to new problems dynamically emerging as changes in what Hayek referred to as the "external facts" arise. However, the human imagination, or "ultimate resource," to constantly conceive of solutions to problems rising anew "is a necessary but not sufficient condition to deal with the challenge of the uncertainty in the shadow of the future. The sufficient nature is of an institutional nature" (Aligica, 2014, p. 146).

Moreover, the institutional consequence of rejecting the strict maximizing behavior of *homo economicus* and the recognition of radical uncertainty of the future opens the way to discovery procedures of various institutional arrangements contingent to particular time and circumstance. The role of institutional discovery procedures is to harness the imaginative and learning capabilities of heterogeneous individuals into dynamically predictable patterns of behavior. In other words, entrepreneurial discovery of institutionally arrangements "economizes" among those technologically feasible institutional arrangements the particular institutional framework of particular time and place that will best facilitate social cooperation under the division of labor.

Hayek recognized "the problem of the division of knowledge which is quite analogous to, and at least as important as, the problem of the division of labor" (1948, p. 50). Throughout their careers, Coase and Ostrom have provided fascinating historical examples to illustrate how entrepreneurial individuals, specializing in the discovery of relevant institutional knowledge, have coped with collective action problems. Given that historical facts are theory-laden, their research has demonstrated that correct historical interpretations require correct theorizing, just as Austrians have argued.

The Bloomington school's emphasis on the knowledge problems is evident in Elinor Ostrom's work on the formation of rules and the importance of rules incorporating local and tacit knowledge. Much of her empirical work illustrates the importance of individuals' ability to utilize local knowledge to devise solutions to local problems which are often superior to solutions developed by outsiders. For instance, Ostrom explains that "the study of irrigation systems in Nepal found that irrigation systems built and governed by farmers themselves are on average in better repair, deliver more water, and have higher agricultural productivity than those provided and managed by a government agency" (Aligica & Boettke, 2009, p. 152). She finds that many community problems can be solved over time through the "skillful pooling and blending of scientific knowledge and local time-and-place knowledge" and that knowledge may come as a "by-product of extended use and careful observation … and this folk knowledge must be preserved and passed along from one generation to the next" (Ostrom, 1990, p. 33).

Faced with the social dilemma of common pool resources, Ostrom (1990) examined the great diversity of institutional forms that a variety of groups have discovered in their effort to govern the commons. She identified across cultures and across time various long and enduring practices that were, at the local level, successful at avoiding the predicted outcome of the tragedy of the commons, by the distinguishing between form and function in rules – or to use her language rules in form versus rules in use in the institutional analysis of development. Faced with a commons problem, economists typically suggest that assignment of private property rights will solve the dilemma. Property rights internalize the costs and benefits of decisions on resource use, and they do so by assigning responsibility, limiting the access of others to the use of your property, and establishing penalties when others violate your property rights.

The fascinating aspect of Ostrom's work is the diverse institutional arrangements adopted by groups of individuals in their effort to govern the commons that are functionally equivalent to private property rights in limiting access, assigning responsibility, and introducing graduated penalties, but do not take the particular form of private property rights. Other scholars of the Bloomington School, such as Filippo Sabetti, have examined how Sicilian peasants prior to the unification of Italy during the 19th century had endogenously discovered rules to govern common pool resources. Such rules defined such activities as animal pasturing, water usage, quarrying, and lumberjacking, in which there were "vast extensions of territory where one owns the land, another the trees, a third has the right to cut down the trees, and a fourth can pasture his animals," and so forth (Sabetti, 2002, p. 50). In use, the peasants exercised private property rights through specialization in their comparative advantage and exchange, even though such private property rights did not exist in form. These informal constraints provided the conditions where self-interest "properly understood" was coordinated among the peasants through a division of labor. Moreover, the common pool resource structure avoided the prohibitively high transactions costs associated with a system of private contractual arrangements, analogous to Coase's theory of the firm, and controlled the use of common pool resources from collapsing into a tragedy of the commons (Blewett, 1995; Ostrom, 1990).

Coase and Wang (2013) outline a fascinating empirical case of institutional evolution in China through spontaneous order. Their study of China's ongoing transition from a centrally planned economy to market-oriented economy "is the quintessence of what Adam Ferguson called 'the products of human action but not human design'" (Coase & Wang, 2013, p. 154). On the heels of Mao Zedong's death in 1976, the Chinese Communist Party under Deng Xiaopang began a platform of reforms to avert the economic collapse precipitated by Mao's socialist experiments in central planning and agricultural collectivization.

Coase and Wang argue that China's rapid economic growth has been a result not of an overarching economic reform plan designed from the top-down, but from a bottom-up spontaneous interaction of Chinese peasants secretly attempting to farm privately in defiance of government policy. Only after this emergent process of de facto privatization of farming began did the government conditionally accept it and later implement it de jure as government policy in 1982. Only after the rules of the game had evolved to confer private property rights did Chinese individuals begin to capture the large-scale gains from trade and innovation that unleashed economic growth. Coase and Wang described the transition process as follows:

> When China became a giant economic laboratory, the forces of competition were able to work their magic. In an experimental process of discovery, resources were directed to their most profitable utilization, institutional arrangements and organizational

> structures emerged to facilitate collective learning. Tinkering with Mao's legacy on the ground, China, step by step, not without sidesteps or retrogressive movements, found itself transformed into a market economy after thirty years of reforms which had been intended to save socialism. (2013, p. 156)

The case of China's economic transition illustrates how obstacles and inefficiencies in the property rights structure create profit opportunities for "institutional entrepreneurs" (Boettke & Leeson, 2009; Li, Feng, & Jiang, 2006) that mutually reinforce the exploit of entrepreneurs within the rules of the game to discover profit opportunities through arbitrage and exchange, unleashing an entrepreneurial discovery process through which the relative scarcities of the means of production are rationally calculated. The comparative static view of a constitutional moment preceding economic reforms overlooks the dynamic process of learning and crafting of new rules through the rivalrous interactions of individuals and how such rivalry manifests itself as the source and consequence of various institutional solutions to institutional problems. The role of rivalry and entrepreneurship in a two-tiered level of spontaneous order analysis is to discover among those technologically feasible possibilities, both productive and protective, which best facilitates the mutual coordination of the purposive actions of individuals.

CONCLUSION

James Buchanan stated that "the economist should not be content with postulating models and then working with such models. His task includes the derivation of the institutional order itself from the set of elementary behavioral hypotheses with which he commences. In this manner, genuine institutional economics becomes a significant and an important part of fundamental economic theory" (1968 [1999], p. 5). The argument put forth in this paper expands upon the notion of "derivation" to include spontaneous order theorizing of the institutional framework based on an elementary behavioral basis of human action – namely individuals engage in the logic of choice and that such choice leads to rivalry.

Human rivalry provides the precondition for polycentricity and institutional evolution as individuals strive to eliminate inefficiencies in achieving social cooperation under the division of labor. This can be conceptualized through the entrepreneurial discovery of pure profit opportunities in generating a more efficient pattern of outcomes by learning new patterns of institutional arrangements. From this perspective, deriving an institutional order is open to not only a parameterization of the rules of the game, as Buchanan had theorized, but also spontaneous order analysis of the institutional framework as well.

The institutional analysis of Buchanan, "married" with the idea of Coasean bargaining and Ostromian constitutional craftsmanship, is not inconsistent with the invisible-hand explanations of endogenous rule formation. In fact, we can see a glimpse of this idea from the opening Buchanan quote, which is cited from a paper in which he remarks on the distinguished career of F.A. Hayek.

Building on Buchanan's inspiration, the future direction of Austrian political economy is open to research on different theories of endogenous institutional change. These future directions include specific focus on (1) developing evaluative criteria against which one can compare states of the world, and (2) making pattern predictions about the process. Moreover, theorizing about endogenous rule formation means that "the diverse approaches of the intersecting 'schools'," namely the Austrian School with other schools of thought, "must be bases for conciliation, not conflict" (Buchanan, 1979, p. 7).

NOTES

1. Our use of the surname "Ostrom" refers jointly to the research program of Vincent Ostrom and Nobel Laureate Elinor Ostrom. See Aligica and Boettke (2009) for an overview of the Bloomington School of Vincent and Elinor Ostrom.
2. Bruno Leoni (1962). Letter to F.A. Hayek. In Masala (2003).
3. See also Storr (2008−2009) for related discussion of how ideological entrepreneurship can drive institutional change.

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