

Creating and Maintaining Innovative Space— A Framework for Unraveling the Complexities of Entrepreneurial Systems

Kevin S. Marshall

*University of La Verne Colleges of Law,
Business and Public Management
E-mail: kmarshall@laverne.edu*

This article proposes a theoretical framework for analyzing, designing, and managing innovative institutional space. Innovative spaces generate macro-level, emergent outcomes. A fundamental challenge of the administrative and managerial sciences is to promulgate, adopt and enforce rules relevant and appropriate to specific goal-oriented spaces, while fostering spatial conditions that nurture the emergent, entrepreneurial properties of complex systems. Emphasizing the revelations of complexity theory, this article argues that differentiation and integration are essential components of an adaptive, progressive space, and that administrative and managerial rules not only define the parameters of space in question, but also influence the innovative, progressive nature of the space. The proposed theoretical framework suggests a two-part analytical process germane to the creation and maintenance of innovative space consisting of 1) the identification and comprehension of the space to be administered or managed, and 2) the identification and analysis of relevant rules (existing or proposed) that positively or negatively impact the emergent properties of such space.

Keywords: Complexity, decision-making, entrepreneurship, innovation, law, managerial, organizational theory, public administration, rule-making.

“Rules define the private spaces within which each of us carry on our own activities.”

Geoffrey Brennan and James Buchanan (2000/1985, p.5)

1. The Conventional Political Economy Approach Regarding the Conditions Necessary for the Creation of Entrepreneurial Systems

Political Economy has long concerned itself with the operational conditions necessary for entrepreneurialism to thrive and flourish. For example, the early theoretical sentiments of neo-classical political economy prognosticated the “slow progress of opulence” in environments oppressed by a stifling, heavy-handed protectionist, and regulatory authority (Smith, 1766/1982, p.521, 521–542). Abbe` de Condillac (1776/2008) proffered



entrepreneurial productivity requires that “trade be fully and permanently free” (p. 326). Madison (1787) implicated the blessings of republicanism and a multiplicity of commercial factions, (Carey, 2001), while De Tocqueville noted the productive nature of voluntary associations (De Tocqueville, 1835/2010, pp. 302–304). The Austrian School of Economics suggested that the entrepreneurial function depends upon an individual’s ability to “act” (von Mises, 1949/2007, p. 11) and “transcend the boundaries of his ignorance” (Hayek, 1960, p. 22). And let us not forget the fundamental roles played by clearly defined property and contract rights (Marshall, 2010).

The conventional political economy approach is to organize its philosophical pseudo-propositions regarding the causality of entrepreneurialism upon conditions of individual, commercial and political liberties. In contrast, this article seeks to reorganize the causality question upon the operational conditions necessary for the creation and maintenance of innovative spaces; spaces within which ideas particulate, mature, evolve, and even combine into new and improved manifestations.

2. A Proposed Revised Approach to Understanding The Creation and Maintenance of Entrepreneurial Systems Based on Complexity Theory

While the political economy literature is replete with positive and normative references to the conditions necessary for a thriving entrepreneurial function, it remains archaically expressed and organized due to the absence of a unifying framework. The derivation of such a framework is promising, especially in light of recent developments in complexity theory. The unifying nature of such a framework is even more promising given that complexity theory seemingly invites interdisciplinary approaches and methods. This article proposes a unifying framework from which to pursue an understanding of entrepreneurialism. The framework itself is essentially an interdisciplinary reconciliation of complexity theory, physics and political economy. The interdisciplinary character of the proposed framework is important to the frameworks unifying potential.

Austrian economist, Ludwig von Mises (1949/2007), instructed that “[o]ne must study the laws of human action and social cooperation as the physicist studies the laws of nature.” (p.2) In the philosophical tradition of Descartes, we must start by revisiting, and perhaps even revising our understanding of “initial conditions” (Hawking & Mlodinow, 2010, p. 26). With a given set of properly specified initial conditions, “the laws of nature determine how a system will evolve over time” (Hawking & Mlodinow, 2010, p. 27). Accordingly, if we seek to explain and predict Schumpeterian entrepreneurial outcomes (Schumpeter, 1942/2008), we must specify, (and perhaps even re-specify) the initial conditions from which such outcomes mature.

Drawing from past and recent theoretical advancements in complexity theory, political economy, and Newtonian/quantum physics, this article elaborates an organizing theoretical construct from which to catalogue the conditions necessary for igniting and sustaining innovative action. The organizing and theoretical construct is space. Properly

identifying and specifying the unit-of-analysis is the first and perhaps the most important step in the science of observation. Complexity theory, political economy and physics all involve the analysis of emergent forces within a defined space. All three disciplines suggest, but perhaps take for granted, that emergence requires space, and the dimensions and characteristics of such space ultimately nurture or obstruct emergent activities.

This article proceeds as follows: 1) It articulates the fundamental tenets and contextual relevancy of complexity theory; 2) It reiterates the Platonic and Socratic methodological approaches to knowledge, drawing on past observations in political economy emphasizing the limitations and fragility of knowledge manifested within complex systems; 3) It observes that, despite the growing acceptance of complexity constructs, there remains a place for Newtonian reductionism in the administrative sciences; 4) It suggests (by way of analogy) that entrepreneurialism is a system of emergent forces; and 5) It proffers a unifying theoretical framework from which the administrative sciences should proceed to analyze, design, (re)configure and manage institutions.

And it is from this proposed framework that this article emphasizes that the fundamental challenge of the administrative sciences lies in its ability to promulgate, adopt and enforce rules relevant and appropriate to specific spaces, while remaining cognizant of the rules necessary to nurture the emergent, entrepreneurial properties of complex systems. Whether the unit of analysis is a household, neighborhood, community, municipality, state, country, strategic multi-jurisdictional alliance, a classroom, place of worship, an art studio, a manufacturing facility, office complex, etc., the proposed framework indicates that the creation and maintenance innovative space requires that the administrative authorities begin with identification and specification of the spatial parameters of the system in question. It is important to determine the emptiness of the space and its conduciveness to the entrepreneurial force of human action. The magnitude of “emptiness” implicates the issue of rules and their relevancy to creating and maintaining a complex, catallactic space.

3. The Complexity Construct and its Contextual Relevancy in the Administrative and Management Sciences

“Complexity represents social systems behavior in which the dynamic synergy of both individual autonomy and social responsibility can produce adaptive emergent behaviors” (Kiel, 2000, p. 68). Complexity theory generalizes that complex systems energized by autonomous and responsible behavior yield surprising macro-level effects (Kiel, 2000, p. 67) ranging from the idyllic to the catastrophic (Taleb, 2010, p. xvi). While cause, effect and dependency are not often linearly predictive in complex, dynamic systems (Taleb, 2010, pp. 358–359), the emergence of evolving and adaptive macro-patterns is nonetheless regularly experienced and expected (Newell & Meek, 2000, p. 83; Taleb, 2010, p. xxvi, p. 358). Autonomous behavior is manifested through the acts of “independent micro-level agents” (Kiel, 2000, p. 67) in pursuit of independent micro-level interests. Autonomous behavior is “responsible” to the extent it conforms to system standards,

norms or expectations that promote and nurture advantageous emergent outcomes. It is “radical” to the extent it obstructs the system’s emergent properties. Given its potential for transformative and advantageous emergent outcomes, complexity is tolerated, revered, and even deliberately pursued. And yet, complexity also has the potential of producing catastrophic macro-level effects, and consequently, complexity is also often feared, discouraged, and even opposed.

It merits noting that the complexity construct is not new to the social sciences. Economics has long recognized the recursive nature of market activities characterized by their multilevel and dimensional feedback loops which fundamentally diminish the ability to conclude linearity with respect to cause and effect. This is the very nature of Neoclassical Economics’ General Equilibrium Model which ultimately was addressed by the introduction of the Partial Equilibrium Model. While economic/social life is complex given its nonlinearity and its unpredictability, it nonetheless has long been acknowledged to possess and exhibit emergent properties. Smith summarized this observed complexity by referencing the “invisible hand” (Smith, 1776/1910, p. 400) Hayek (1960) observed that “[w]e know little of the particular facts to which the whole of social activity continuously adjusts itself in order to provide what have learned to expect. We know even less of the forces that bring about this adjustment by appropriately co-ordinating individual activity.” (p. 25)

The renewed attention to complexity theory is triggering a paradigm shift with respect to exploring, critiquing, or designing social system constructs. It is “shifting attention from individual components and relationships to overall pattern[s] or motif[s] created by the system” (Newell & Meek, 2000, p. 83) This shift in focus is driven by an expectation that complex systems generally demonstrate long-run stability with respect to producing advantageous emergent patterns. It is this long-run stability that overshadows the system’s associated risks. And the expected long-run advantageous patterns are attributed to be dynamically creative, “evolutionary, entrepreneurial, and ultimately sustainable.

While stability is comforting given its perceived stasis, interim instability is disruptive and distressing. Environments of disequilibria, however, frequently fuel innovative and adaptive solutions. Fluctuation and recursive non-linearity often begets progressive order (Kiel, 2000, p. 72). Austrian economist and Nobel Laureate, Friedrich Hayek (1960), instructed:

It would be more correct to think of progress as a process of formation and modification of the human intellect, a process of adaptation and learning in which not only the possibilities known to us but also our values and desires continually change. As progress consists in discovery of the not yet known, its consequences must be unpredictability. It always leads to the unknown, and the most we can expect is to gain an understanding of the kind of forces that bring it about (p. 40)

The desirability of progressive order lies in its revealing and creative attributes. Accordingly, complexity theory offers insight to understanding how to create and maintain innovatively sustainable and progressive social systems:

“A good society, one that encourages individuals to realize their potential and permits complexity to evolve, is one that provides room for growth. Its task is not to build the best institutions,

create the most compelling beliefs, for to do so would succumb to an illusion. Institutions and beliefs age rapidly; they serve our needs for a while, but soon begin to act as brakes on progress . . . the task of a good society is not to enshrine the creative solutions of the past into permanent institutions; it is rather, to make it possible for creativity to keep asserting itself.” (Csikszentmihalyi, 1993, p. 276, as cited in Kiel, 2000, p.72)

The arts and sciences are in a constant pursuit of unraveling and understanding the complexities of entrepreneurial systems. Neoclassical political economy has long revered entrepreneurial action to be socially responsible and beneficial. From a purely economic perspective, entrepreneurial activity addresses and temporarily frees society from the constraints of scarcity. From a metaphysical perspective, entrepreneurial activity provides gateways to higher levels of understanding and being. From a complexity perspective, entrepreneurialism is system within which atomistic forces are capable of producing emergent outcomes—in which eureka moments are manifested and experienced. And this entrepreneurial experience is not exclusive to only the economic and commercial realms, but rather it abounds throughout all aspects of human activity.

The entrepreneurial spirit (and its innovative outcomes) recursively fuels hope of a better tomorrow despite today’s constraints. The administrative act of creating and maintaining entrepreneurial and innovative space, therefore, is individually and socially advantageous. Complexity theory, although with little specificity, suggests that within certain systems “it is possible for creativity to keep asserting itself” (Csikszentmihalyi, 1993, p. 276 as cited by Kiel, 2000, 72). The challenge for the administrative sciences is determining the attributes of such a system, and then purposefully designing a system within which such innovative and creative attributes thrive.

4. The Complexity and Fragility of Knowledge

Dynamic complexity defies conventional forecasting, design, planning and analytical methods (Newell & Meek, 2000, p. 87). Complexity theory acknowledges, and even emphasizes the “severe limitations to . . . learning from . . . observations or experience and the fragility of our knowledge” (Taleb, 2010, p. xxi). Complexity cautions against *platonicity*. Platonicity is the “tendency to mistake the map for the territory, to focus on pure and well-defined ‘forms’, whether objects, like triangles, or social notions, like utopias (societies built according to some blue print of what ‘makes sense’)” (Taleb, 2010, p. xxix). “Platonicity is what makes us think that we understand more than we actually do” (Taleb, 2010, p. xxx). Complexity, on the other hand, embraces *socraticity*. Socraticity is “the recognition that our ignorance is the beginning of wisdom” (Taleb, 2010, p. xxx). It is from such ignorance that emergent knowledge is nurtured and realized. Although the allure of platonicity dominates the pursuits of the social science academy, it merits noting that such concepts of complication, ignorance and the fragility of knowledge have been long acknowledged within the academy, and particularly within the field of political economy. Nevertheless, the social science academy generally, regularly and cavalierly glosses over this ignorance as but a minor imperfection in its analytical processes (Hayek, 1960, p. 25).

Adam Smith (1776/1910) conceptualized the complexification of an “invisible hand” with emergent force capable of producing macro-level patterns and outcomes without specific intention or knowledge of doing so (p. 400).

Social philosopher and historian Adam Ferguson (1768) (in his *Essay on the History of Civil Society*) identified a “state of complication” from which successive and progressive social improvements emerged not by human design but by a variety of situations within which mankind was placed, which could not be knowingly predicted nor fully comprehended. Ferguson (1768) explained:

Every step and every movement of the multitude even in what are termed enlightened ages, are made with equal blindness to the future; and nations stumble upon establishments, which are indeed the result of human action, but not the execution of any human design. (p. 187)

* * *

The artifices of the beaver, the ant and the bee, are described to the wisdom of nature. Those of polished nations are ascribed to themselves, and are supposed to indicate a capacity superior to that of rude minds. But the establishments of men, like those of every animal, are suggested by nature, and are the result of instinct, directed by the variety of situations in which mankind are placed. Those establishments arose from successive improvements that were made, without any sense of their general effect; and they bring human affairs to a state of complication, which the greatest reach of capacity with which the human nature was ever adorned, could not have projected; nor even when the whole is carried into execution, can it be comprehended in its full extent. [*emphasis added*] (p. 279)

Political economist and social philosopher Ludwig von Mises (1949/2007) observed:

Since time immemorial men have been eager to know the prime mover, the cause of all being and all change, the ultimate substance from which everything stems and which is the cause of itself. Science is more modest. It is aware of the limits of the human mind and of the human search for knowledge. It aims at tracing back at every phenomenon to its cause. But it realizes that these endeavors must necessarily strike against insurmountable walls. There are phenomena which cannot be analyzed and trace back to other phenomena. They are the ultimate given. The progress of scientific research may succeed in demonstrating that something previously considered as an ultimate given can be reduced to components. But there will always be some irreducible and unanalyzable phenomena, some ultimate given (p. 17).

* * *

Concrete value judgments and definite human actions are not open to further analysis. We may fairly assume or believe that they are absolutely dependent upon and conditioned by their causes. But as long as we do not know how external facts—physical and physiological—produce in a human mind definite thoughts and volitions resulting in concrete acts, we have to face an insurmountable *methodological dualism*. In the present state of our knowledge the fundamental statements of positivism, monism and panphysicalism are mere metaphysical postulates devoid of any scientific foundation and both meaningless and useless for scientific research. Reason and experience show us two separate realms: the external world of physical, chemical, and physiological phenomena and the internal world of thought, feeling, valuation, and purposeful action. No bridge connects—as far as we see today—these two spheres. Identical external events result sometimes in different human responses, and different external events produce sometimes the same human response. We do not know why (p. 18).

Hayek (1960) further acknowledged the relevance and inter-relatedness of complexity, ignorance and the fragility of knowledge by observing:

The misleading effect of the usual approach stands out clearly if we examine the significance of the assertion that man has created his civilization and that that he therefore can also change its institutions as he pleases. This assertion would be justified only if man had deliberately created civilization in full understanding of what he was doing or if he at least clearly knew how it was being maintained. In a sense it is true, of course, that man has made his civilization. It is the product of his actions or, rather, of the action of a few hundred generations. This does not mean, however, that civilizations is the product of human design, or even that man knows what its functioning or continued existence depends upon (p.23)

The “inescapable [multidimensional] interdependence of [social] phenomena” (von Mises, 1949/2007 p. 2) imposes significant limitations on one’s ability to comprehend and address the separate and differentiated realities of social life; it renders knowledge fragile. Although the social science academy has been, and continues to be warned of the errors associated with reductionism and its overly simplistic causal models, it continues to offer explanatory narratives grounded upon directional, causal conjectures and probabilities. The legitimacy of such narratives seems circularly dependent upon the legitimacy of the power to engineer social solutions to social problems. Since A causes B, we can socially yield B by engineering the condition of A. And since we can socially yield B, by engineering the conditions of A, then A must indeed cause B. And yet, social systems are complex, recursive, non-linear, and ultimately incapable of being reduced to a simple, linear causal model.

It is interesting that economics, for example, speaks of “general equilibrium analysis,” and yet acquiesces to the complexity of market phenomena and its interdependent and recursive natures by adopting “*ceteris paribus*” principles or by resorting to more simplistic and manageable “partial equilibrium analysis.” Economics theorizes that patterns of general equilibria emerge from certain economic markets. But given the dynamic nature of such markets, such patterns of equilibrium are unobservable at any instant in time. Moreover, given the complexity of such market phenomena, it is necessary for the economist to resort to abstractions and partial equilibrium analytics for the purpose of comprehending market realities. And it is from such analytical and modeling processes that social administrators find themselves engineering policy directives purposefully designed to achieve specific policy objectives.

5. The Relevance and Limitations of Newtonian Reductionism in a Complex World

Certainly Newtonian reductionism is of value in assessing, analyzing and organizing one’s journey through the complex socio-physical world (Marion, 1999, p. 13). Despite the challenges of complexity, reductionist approaches and modeling advance knowledge. “When models are restricted to their intended uses, they are reasonably appropriate” (Marion, 1999, p. 11).

Reality is an elusive commodity, and the best one can hope for are closer and closer approximations of it. We may never arrive at absolute and total reality, and even if we did our blindness would likely prevent us from being able to confirm our arrival. Nonetheless, our models serve us well, for we learn eventually to ride our elephants and use them for work. Model building is a process of building and rebuilding with each cycle pushing back the darkness a bit farther than did the previous one (Marion, 1999, p. 12).

Notwithstanding the revelations of complexity theory, the Newtonian world of calculus and mechanistic design remains relevant with respect to the administration of complex systems. Despite the existence of complexity, social science observers are indeed capable of measuring, causally establishing, and probabilistically predicting social phenomena, especially at the micro-level. And this reductionist approach remains relevant because it contributes to one's ability to observe and comprehend, especially at the micro-level.

Given the relevancy and contributory value of both conventional reductionism and complexity theory, each has a place in the administrative and managerial sciences. The academic conversation must, and will continue to explore the appropriate relevancy of each. The following proposed framework acknowledges and reconciles these two theoretical paradigms (i.e., platonicity/reductionism and socraticity/complexity) such that they jointly contribute to the design and comprehension of complex social phenomena.

The application of Newtonian mechanics for the purpose of abstracting the forces driving a non-linear, recursive, complex social system reveals a framework that recognizes the contributions of both complexity theory and reductionism. Moreover, it provides insight with respect to designing entrepreneurial space, at least in as much as such space exhibits characteristics of emergence, a fundamental characteristic of entrepreneurialism.

6. Entrepreneurial Forces, Newtonian Forces and Innovative Space

Ludwig von Mises (1949/2007) maintained that the traditional [political] economic framework of analysis proffered by the classical school was constrained by its theoretical nexus to economic phenomena and constructs (e.g., wealth, selfishness, profit, etc.) (p. 2). He further explained that from this classical school of political economy emerged a "general theory of human action, *praxeology*. The economic or catallactic problems [were] embedded in more general science, and can no longer be served from its connection to economic action" (p. 3). Mises (1949/2007) argued:

It is no longer enough to deal with the economic problems within the traditional framework. It is necessary to build the theory of catallactics upon the solid foundation of a general theory of human action, *praxeology*. This procedure will not only secure it against many fallacious criticisms but clarify many problems hitherto, not even adequately seen, still less satisfactorily solved. There is, especially, the fundamental problem of economic calculation. (p. 7)

Mises observed that "[i]n the course of social events there prevails a regularity of phenomena to which man must adjust his actions if he wishes to succeed" (p. 2). Such

action, while purposeful, need not be viewed from arbitrary normative perspectives of being good or bad, but rather may be viewed from the positive perspective that such action simply takes place. Social action is an aggregation of human action, and “human action is purposeful behavior” (von Mises, 1949/2007, p.12). Action is “will put into operation” (von Mises, 1949/2007, p.11) It is a force that drives outcomes, and ultimately emergent outcomes. It is in this regard that Newton’s laws of motion are relevant and instructive.

It was Newton’s wish to develop a “quantitative yet comprehensive description of the physical world that accorded with factual descriptions of how things behave[d]” (Lederman & Teresi, 1993, p. 97). It is understood, even experienced, that nature creatively evolves in a Schumpeterian manner, provided that it has the space to do so. Lederman & Teresi (1993) artfully provided the following quantum illustration:

Have only a few different styles of atoms, like smooth, rough, round, angular, and have a selected number of different sharps, but have an infinite supply of each kind. Then put them in *empty space* [emphasis added]. . . . Let those atoms move about at random. Let them incessantly, occasionally colliding, sometimes sticking and collecting together. Then one collection of atoms makes wine, another makes the glass in which it is served, ditto feta cheese, baklava, and olives (p. 42).

From a quantum perspective, space is quintessential; without it there can be no force, no motion; and without motion there can be no creative atomic evolution (Lederman & Teresi, 1993, p. 42–45). Thus, the laws of nature dictate that motion (and thereby forces) are relevant for evolutionary change. Newton’s definition of momentum (Definition Two) and his Second Law of Motion (Law II), informs that $F = ma$, where “F” represents force (the causative agent for change of motion), “m” represents mass, and “a” represents acceleration (Lederman & Teresi, 1993, p. 42–45). In nature, such force is the causative agent for change, and understanding the components of such force is critical to understanding the natural order and its infinite potential.

By analogy, entrepreneurialism is a force; it is characteristically innovative in nature for which $E = ma$, where “E” represents the Schumpeterian entrepreneurial function, “m” represents physical matter (of both earthly and cosmological origin), and “a” represents the innate, psychological, spiritual, intellectual, physical, and imaginary energies of

Definition II

The quantity of motion is the measure of the same, arising from the velocity and quantity of matter conjunctively.

LAW II

The alteration of motion is ever proportional to the motive force impressed; and is made in the direction of the right line in which that force is impressed.

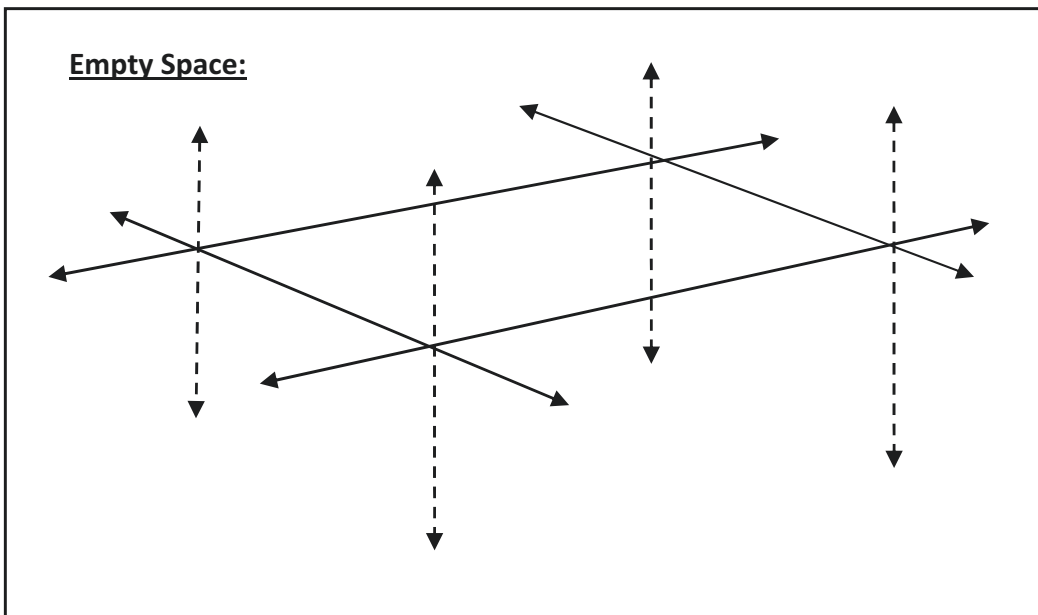
Isaac Newton, *The Principia*, 1642–1727 (p. 19)

mankind (human capital). Similar to Newton’s vision of the mechanical world, Schumpeterian Entrepreneurialism is driven by a specified relationship between “m” and “a”, all of which requires that there be space within which this relationship is expressed, experienced, and matured. And consistent with our evolving understanding of the dynamic, quantum world, both “m” and “a” are complex, each with immense possibilities, of which their interaction implicates infinity—as long as there exists sufficient interactive space. It is proposed herein that entrepreneurialism, as a force (i.e. an agent of change), requires space, and the creation and maintenance of such space is an important social and public policy goal. It is upon this theoretical construct that the entrepreneurial function may be better articulated and conceptualized.

7. Empty Space—The Initial Condition of Entrepreneurialism and Innovation

Empty space is paramount for the exertion of force. Space is realm within which intent is actuated. It can emerge from nature or artificial design. It is multi-dimensional. It likely has both a vertical and horizontal axis. It can be unbounded and infinite; or prescribed, circumscribed or specified. It’s is as important as the matter and energy contained within its dimensions. It is the playground in which force exerts itself and motion reveals itself. Space, and in particular, empty space is the initial condition within which human action, entrepreneurial action (or force) manifests itself. Thus, understanding space and its dimensions is the starting point for administrative comprehension.

All human action takes place within a given space, and it is in this regard, that human action is spatial. Whether we are investigating output in the classroom, a firm, an agency,



municipality, state or national sovereignty, all such investigations begin with the identification or specification of relevant spatial parameters. Although often taken for granted by the administrative sciences, such identification and specification is the necessary first step in the analysis of human action.

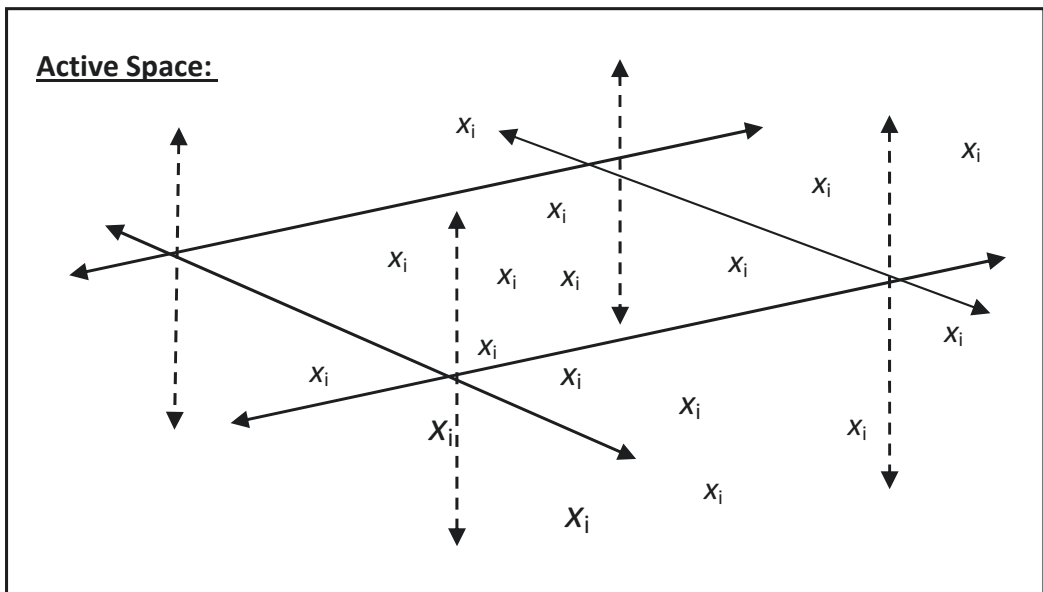
Social externalities are spatial in nature. They manifest themselves within spatial certain parameters. Administrative design, hierarchies, and networks are implemented with regard to spatial horizons and constraints. Agency and firm strategies evolve within spatial contexts. Knowingly, and often unknowingly, the relevance of spatial contexts or parameters is often taken for granted, under-estimated, or even purposively ignored within administrative design processes.

8. The Premise of Active and Self-Organizing Space

Newtonian mechanics teaches:

[T]hings move because that's all they can do. Motion is natural. . . . All things in the universe move, taking part in the great flow of time. If everything in the universe was left unattended and alone, all things would move just as they had eons ago. Whatever motion they had then, they would have now. Everything would flow in continuous way. But things interact with each other. And each interaction causes their motion to 'bend' or 'accelerate' (Wolf, 1989, p. 38–39).

Similarly, classical political economy speaks of a “spontaneous,” “self-organizing” and “self-generating order” in which “every single piece has a principle motion of its own. . . .” (Hayek, 1973, p. 35). Praxeology teaches that human action is “an element of cosmic activity and becoming” (von Mises, 1949/2007, p. 18). and that “[h]uman life is an unceasing sequence of single actions” (von Mises, 1949/2007, p. 45). And thus,

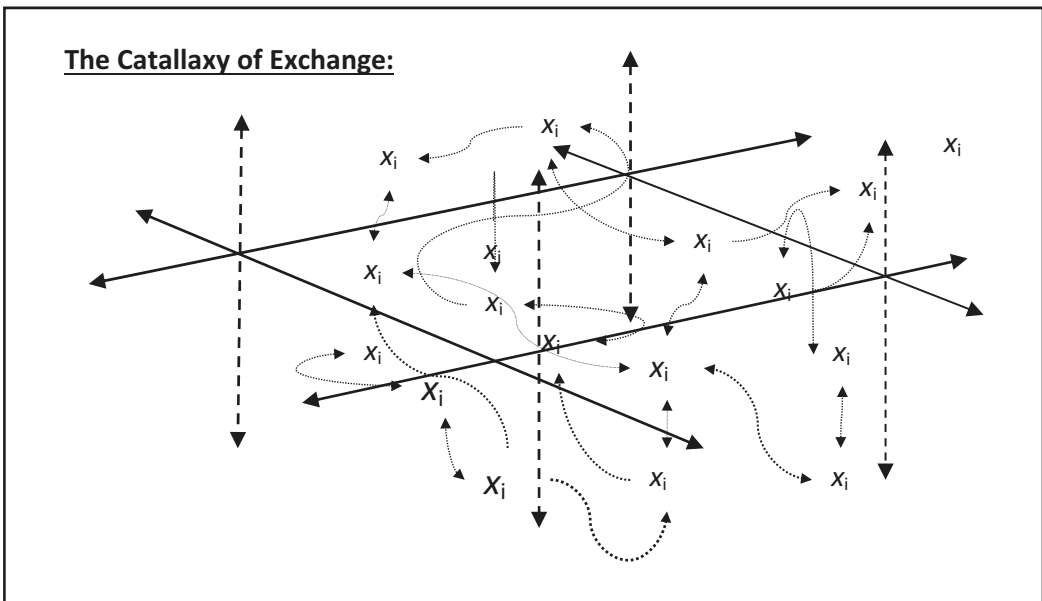


social action, manifested through action of individuals and the aggregation of individuals, constitutes force, which if left alone moves through social space in a spontaneous, self-organizing and self-organizing manner, sometimes linearly, sometimes non-linearly. Because human action is analogous to Newtonian force, and because the exertion of such force requires empty space, the identification and comprehension of the relevant spatial realm within which such action (or force) is manifested should dominate the initial stages of any administrative analysis.

9. The Austrian School's Catallaxy and its Newtonian Relevancy

Hayek (1976, pp. 106–109), in explaining the nature of spontaneous order, and drawing on the work of Whately (1832, p. 4–6) and von Mises (1949/2007, p 3), introduced and developed the term *catallaxy*. A “catallaxy” is the special kind of spontaneous market order” emerging from the mutual and reciprocating adjustments of many market participants within a given social space (Hayek, 1976, p. 108). A catallaxy is pluralistic without a common hierarchy of particular ends (Hayek, 1976, p. 109). It is a space in which human action differentiates and integrates, provided the space is empty and conducive to differentiation and integration.

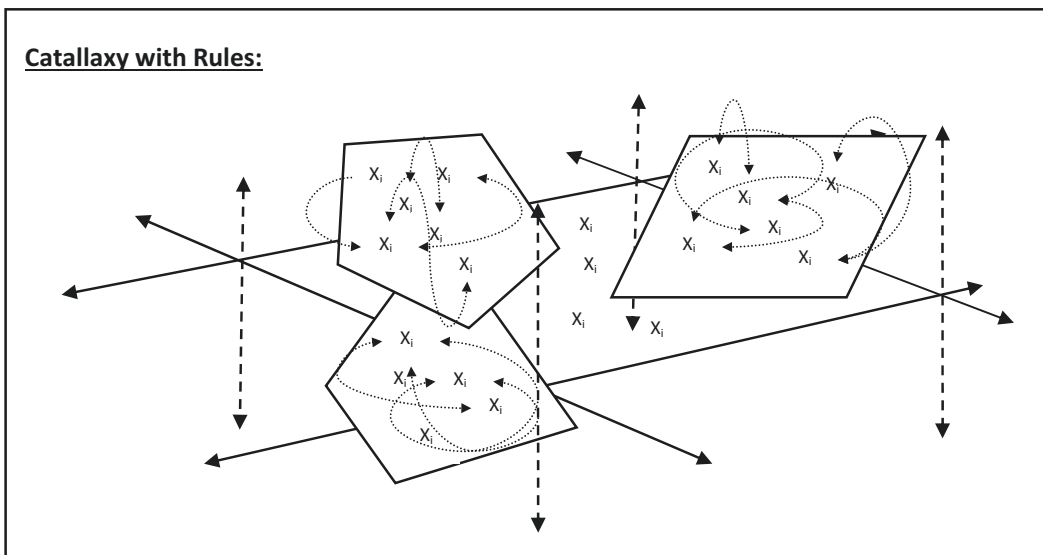
Newton mechanics teaches that force is in a constant state of motion: “things move because that’s all they do” (Wolf, 1989, p. 38). And so it is in a catallaxy. Force is manifested through human action, naturally so, in pursuit of a more satisfactory state of affairs (von Mises, 1949/2007, p.13). Such force is natural and spontaneous, provided there is space for to exert itself, uninterrupted and unobstructed. Catallactic space is



complex space. It is non-linear, uncertain, recursive, and yet produces emergent outcomes at the macro-level. Absolute empty catallactic space is likely analogous to social anarchism—theoretical envisioned to be infinitely unbounded and unobstructed (although as a practical matter there is no “absolute empty space” in any system to the extent it consists of particles or participant-actors capable of colliding and whose collision ultimately redirects, obstructs and even eradicates the forces that emanate from their active state).

10. Catallaxy with Rules—Using Rules to Define Space

Newton illustrated that “[t]hings move because that’s all they can do. Motion is natural. It’s only when motion is disrupted that we should wonder what is going on” (Wolf, 1989, p. 38). Human action is an initial condition of the catallaxy of exchange. It “must be considered as an ultimate given and must be studied as such” (von Mises, 1949/2007, p. 18). As in physics, when spontaneous motion (or action) is disrupted, we should wonder why? What lies in the path of expected action? From the administrative science’s perspective attentive to revelations of complexity, the inquiry should focus on identifying and addressing the existence of spatial clutter that jeopardizes the attributes of empty space, a necessary condition for the force of human action to freely and infinitely manifest itself. From a social engineering perspective, such clutter will likely consist of institutionalized rules. Moreover, such clutter is often addressed by the adoption of offsetting rules intended to marginalize the effect of the spatial clutter and ultimately further nurture a social space within which a catallaxy of exchange will thrive.



Austrian philosopher (and economist) Geoffrey Brennan and political economist (and Nobel Laureate) James M. Buchanan maintained that: “[r]ules define the private spaces within which each of us carry on our own activities” (Brennan & Buchanan, 2000, p. 5):

[T]he *rules* that coordinate the actions of individuals are important and are crucial to any understanding of the interdependence process. The same individuals with the same motivations and capacities will interact to generate quite different aggregate outcomes under differing sets of rules, with quite different implications for the well-being of every participant. . . . At least since the eighteenth century, and notably since Adam Smith, the influence of rules (Smith’s term was “laws and institutions”) on social outcomes has been understood, and this relationship has provided the basis for a central theme in economics and political economy, particularly as derived from their classical foundations.

If rules influence outcomes and if some outcomes are “better” than others, it follows that to the extent that rules can be chosen, the study and analysis of comparative rules and institutions become proper objects of our attention. Without an understanding of how the individuals who make up a social order interact, and how different sets of rules affect these interactions, it is impossible for participants to make informed changes in existing rules or even to behave prudently with respect to the preservation of those rules that have proved essential to the tolerably efficient functioning of the society as such (Brennan & Buchanan, 2000, p. 4).

11. The Challenge of the Administrative and Managerial Sciences: Promulgating and Administering Rules Relevant and Appropriate to “Catallactic” Spaces

The fundamental challenge of the administrative sciences, therefore, lies in its promulgation, adoption, and administration of rules relevant and appropriate to specific catallactic spaces, while remaining cognizant of the rules necessary to nurture the emergent, entrepreneurial properties of complex systems. Herein lays the value and contribution of complexity theory with respect to the administrative sciences. On the one hand, it reveals the limits of administrative design given the unavoidable ignorance of its participant-actors and the fragmentation of knowledge at the micro-levels. On the other hand, it reveals self-organizing and self-generating entrepreneurial and adaptive forces capable of producing emergent and progressive patterns within systems bounded by scarcity. These juxtaposing revelations ultimately provide insight into the creation and maintenance of creative and innovative space. It lies in creating and maintaining complex space conducive to spontaneous, self-organizing and self-generating order. For the administrative sciences, it reveals that the creation and maintenance of innovative space is accomplished through the promulgation, adoption and administration of rules designed to facilitate the emergence of adaptive, macro-level patterns.

Although the contribution of this paper springs from its emphasis on the role spatial foundations and parameters play with respect to nurturing and maintaining, thriving emergent entrepreneurial systems, it necessarily recognizes and adopts both Hayekian principles of law and classical economic principles of spontaneous order:

Once we see that, in the absence of a unified body of knowledge of all the particulars to be taken into account, the overall order depends on the use of knowledge possessed by the individuals and

used for their purposes, it becomes clear that the role of government in that process cannot be to determine particular results for particular individuals or groups, but only to provide certain generic conditions whose effects on the several individuals will be unpredictable. It can enhance the chances that the efforts of unknown individuals towards equally unknown aims will be successful by enforcing the observance of such abstract rules of conduct as in the light of past experience appear to be most conducive to the formation of a spontaneous order¹ (Hayek, 1976, p. 11).

12. The Proposed Framework of Analysis

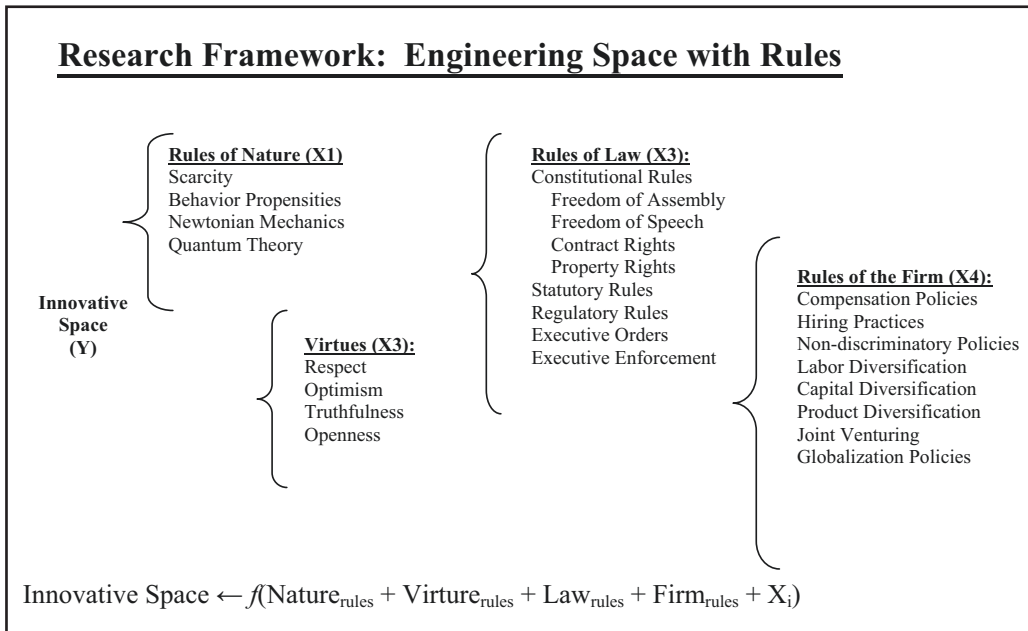
In its most generally stated form, the proposed research question is: what drives innovation? Or what conditions are necessary for innovative markets to thrive? In its more specified form: can innovative space be socially engineered (or impaired) by rules and laws? Guided by complexity theory, the proposed framework of analysis directs the administrative sciences to examine the causal relationship between innovative space (the dependent variable) and a variety of explanatory variables falling within the following general categories of rules: Rules of Nature, Rules of Virtue and Ethics, Rules of Law, and Rules of Management. The framework proposes that rules be examined with respect to their impact on the property of emergence experienced within complex systems, grounding such examination on the Newtonian concept that emergence is ultimately force exerted within empty space:

(H₁): Innovative space is a function of governing rules.

(H₀): Innovative space is not influenced by governing rules.

Using this framework, the administrative sciences should attempt to examine the relationship between innovative space and rules from both a theoretical and quantitative perspective. As demonstrated above, the theoretical component of the framework is interdisciplinary in nature, identifying and organizing the rules of nature, virtue, law, and management upon the concept of creating and designing innovative space. The quantitative component will seek data that operationally measures the dependency of innovative space on the implementation of appropriate rules conducive to emergent outcomes. For example, the dependent variable (innovative space) might be operationally measured by the number of patents recognized by a particular jurisdiction. Hypothesized corresponding explanatory variables (e.g., constitutional rules of law) might be operationally measured by the dichotomous provision and protection of such constitutional rights as freedom of assembly or speech, or the right to due process, etc. or by the provision of statutory regulations nurturing or constricting the flow of information in the market place. The figure below offers a graphic overview of potentially relevant variables, although certainly not exhaustive, to be considered in the proposed framework of analysis.

¹ Friedrich A. Hayek, *Law Legislation and Liberty*, Volume 2 *The Mirage of Social Justice* (University of Chicago Press, 1976), 11.



13. Implications and Anecdotal Applications Relevant to the Administrative and Managerial Sciences:

The proposed framework has significant implications with respect to the administrative and managerial sciences. First is suggests a two-part analytical process consisting of 1) the identification and comprehension the complex space in question, and 2) the identification and analysis of relevant rules (existing or proposed) that positively or negatively impact the emergent properties of such space.

To the extent that entrepreneurialism constitutes a force, Newtonian mechanics teaches that there is a profound relationship between the manifestation of force and the space in which it exerts itself. Such space, depending on its cosmic clutter, may facilitate, modulate, exacerbate, accentuate, or even terminate the force driving entrepreneurial outcomes. While it is important to understand the directional relationships between rules (i.e. , language, cultural traditions and virtues, formal law, organizational mission statements, management standards, principles and prescriptions) and their impact on complex, catalytic space, it is first and foremost important that the scope, dimensions, and purpose of the space be identified and understood.

Complexity theory has long acknowledged that differentiation and integration are essential components of an adaptive, complex system (Marion, 1999, p. 143–150; Kiel, 2000, p. 70). Integration suggests motion, and motion again implicates space. To the extent that differentiation is dynamically sustainable process, it too implicates motion, again implicating the space in which it manifests. It is reasonable then that the management and administration of creative and innovative space requires the maintenance of a space conducive to both differentiation and integration.

Both the scope and dimensions of the space, as well as the endogenous and exogenous rules relevant to the space have significant import to managers and administrators. Is the catallactic space in question homogeneous in nature? Or populated with diverse participant-actors? Is the space bounded? Unbounded? Circumscribed but permeable? What rules within the space facilitate differentiation? Suppress differentiation? Facilitate or suppress integration? And the inquiry as to rules is an inquiry in general with broad implications. The inquiry includes rules emanating from or relating to the state of nature, linguistics, culture, psychology, tradition, habit, artificial design, statutory or constitutional promulgations, firm structure, duties, architectural design, and so on.

Whether the unit of analysis is a household, neighborhood, community, municipality, state, country, strategic multi-jurisdictional alliance, a classroom, place of worship, an art studio, a manufacturing facility, office complex, etc., the proposed framework indicates that the creation and maintenance innovative space requires that the administrative authorities begin with identification and specification of the spatial parameters of the system in question. It is important to determine the emptiness of the space and its conduciveness to the entrepreneurial force of human action. The magnitude of “emptiness” implicates the issue of rules and their relevancy to creating and maintaining a complex, catallactic space.

References

- Brennan, G., & Buchanan, J. (2000). *The Collected Works of James M. Buchanan*, Vol. 10 (The Reason of Rules: Constitutional Political Economy) Foreword by Robert D. Tollison (Indianapolis: Liberty Fund, 1999). Retrieved 1/26/2015 from the World Wide Web: <http://oll.libertyfund.org/titles/1826>.
- Carey, G. W. (2001). Federalist No. 10 by James Madison, 1787. In G. W. Carey & J. McClellan (Eds.), *The federalist (The Gideon edition)* [Edited with an introduction, reader's guide, constitutional cross-reference, index, and glossary]. Indianapolis, IN: Liberty Fund. Retrieved from <http://oll.libertyfund.org/titles/788>
- Csikszentmihalyi, M. (1993). *The evolving self: A psychology for the third millennium*. New York, NY: HarperCollins.
- De Tocqueville, A. (2010). Of political associations (Chap. 4, Vol. 2) (J. T. Schleifer, Trans.). In E. Nolla (Ed.), *Democracy in America (1835): Historical-critical edition of De la démocratie en Amérique (Vols. 1–4). A bilingual French–English edition*. Indianapolis, IN: Liberty Fund. (Reprinted from *De la démocratie en Amérique* by E. Nolla, Ed., 1990, Paris, France: Librairie Philosophique)
- Étienne Bonnot & Abbe de Condillac (2008). *Commerce and government considered in their mutual relationship* (S. Eltis, Trans. with an introduction to his life and contribution to economics, by S. Eltis & W. Eltis). Indianapolis, IN: Liberty Fund. (Reprinted from *Commerce and government considered in their mutual relationship* by S. Eltis & W. Eltis, Eds., 1997, Cheltenham, England: Edward Elgar. Originally published 1776)
- Ferguson, A. (1768). *An essay on the history of civil society* (2nd ed.). London, England: Printed for A. Millar and T. Cadell in the Strand, and A. Kincaid and J. Bell, Edinburgh.
- Hawking, S., & Mlodinow, L. (2010). *The grand design*. New York, NY: Bantam Books.
- Hayek, F. A. (1960). *The constitution of liberty*. Chicago, IL: University of Chicago Press.
- Hayek, F. A. (1973). *Law legislation and liberty, volume 1: Rules and order*. Chicago, IL: University of Chicago Press.
- Hayek, F. A. (1976). *Law legislation and liberty, volume 2: The mirage of social justice*. Chicago, IL: University of Chicago Press.
- Kiel, D. (2000). The sciences of complexity and public administration, complexity as challenge and goal. In G. Morcol & L. F. Dennard (Eds.), *New Sciences for Public Administration and Policy Connections and reflections* (pp. 63–80). Burke, VA: Chatelaine Press.

- Lederman, L., & Teresi, D. (1993). *The god particle: If the universe is the answer, what is the question?* New York, NY: First Mariner Books.
- Madison, James. Federalist No. 10: "The Same Subject Continued: The Union as a Safeguard Against Domestic Faction and Insurrection." *New York Daily Advertiser*, November 22, 1787.
- Marion, R. (1999). *The edge of organization, chaos and complexity theories of formal social systems*. Thousand Oaks, CA: SAGE.
- Marshall, K. S. (2010). Free enterprise and the rule of law: The political economy of executive discretion (efficiency implications of regulatory enforcement strategies). *William and Mary Business Law Review*, 1(2), 235–321.
- Newell, W. N., & Meek, J. W. (2000). What can public administration learn from complex systems theory? In G. Morcol & L. F. Dennard (Eds.), *New sciences for public administration and policy connections and reflections* (pp. 81–105). Burke, VA: Chatelaine Press.
- Newton, I. (1995). *The principia*. Amherst, NY: Prometheus Books. (Reprinted from *Newton's principia*, 1st American ed., carefully rev. and corr. with the life of the author by N. W. Chittenden, 1848, New York, NY: D. Adee)
- Schumpeter, J. A. (2008). *Capitalism, socialism and democracy* (with introduction by Thomas K. McCraw) (First Harper Perennial Modern Thought Edition). New York, NY: Harper Perennial. (Reprinted from *Capitalism, socialism and democracy*, 1942, 2nd ed. 1947, 3rd ed. 1950, New York, NY: Harper & Brothers)
- Smith, A. (1910). *The wealth of nations*. London, England: J. M. Dent (Originally published 1776)
- Smith, A. (1982). *Lectures on jurisprudence (Report dated 1766)*. Indianapolis, IN: Liberty Fund. (Reprinted from *The Glasgow edition of the works and correspondence of Adam Smith Vols. 1–5*, by Ronal L. Meek et al., Eds., 1978, Oxford, England: Clarendon Press)
- Taleb, N. N. (2010). *The black swan, the impact of the highly improbable*. New York, NY: Random House Trade Paperbacks.
- von Mises, L. (2007). Introduction: Economics and praxeology (Vol. 1). In B. B. Greaves (Ed.), *Human action, a treatise on economics* (Vols. 1–4). Indianapolis, IN: Liberty Fund. (Reprinted from *Foundations for economic education*, 4th rev. ed. 1996, New York, NY: Irvington-on-Hudson. Originally published 1949 by Yale University Press)
- Whately, R. (1832). *Introductory lectures on political economy, delivered in easter term 1831* (2nd and enlarged ed.). London, England: B. Fellowes. Retrieved from http://oll.libertyfund.org/titles/1377#Whately_0208_27
- Wolf, F. A. (1989). *Taking the quantum leap: The new physics for non-scientist* (Perennial ed.). New York, NY: Harper & Row.