

GÖDEL'S INCOMPLETENESS THEOREMS AND NORMATIVE SCIENCE METHODOLOGY: A SYSTEMS THEORY APPROACH

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Resumen: Examino los fundamentos teóricos fundamentales del método praxeológico, aplicado al componente normativo de la economía política. Sugiero que el teorema de incompletitud de Gödel implica que el componente teórico de la praxeología descansa necesariamente en axiomas indemostrables, y doy ejemplos de las conclusiones inconsistentes cuando se aceptan ciertos axiomas praxeológicos como verdades universales y absolutas. Luego propongo la teoría de sistemas como marco para la investigación de la veracidad de estos axiomas y sugiero métodos literarios como esenciales en su formulación. Finalmente, considero el derecho constitucional como un ejemplo de las aplicaciones prácticas de la teoría normativa económico-jurídica y la importancia de tener robustos principios de base.

Palabras clave: Gödel; Praxeología; Lógica; Ética; Ontología.

Clasificación JEL: B53; A13; P14.

Abstract: I examine the foundational theoretical underpinnings of the praxeological method as applied to the normative component of political-economics. I suggest that Gödel's incompleteness theorem implies that the theoretical component of praxeology necessarily rests on unprovable axioms, and I give examples of the inconsistent conclusions when accepting certain praxeological axioms as universally and absolutely true. I then propose systems theory as a framework for investigation of the truth value of these axioms and suggest literary methods as essential in their formulation. Finally, I look at constitutional law

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as an example of the practical applications of normative economic-law theory and the importance of sound first principles.

Keywords: Gödel; Praxeology; Logic; Ethics; Ontology.

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Abstract

Mathematics, logic, and human action have been both fundamental and historically conflicting in the study of economics. While the economic positivist methodology which relies on mathematical models and data sets is erroneous, this does not imply that all of mathematics is irrelevant to the study of economics. Given that both praxeology and mathematics are foundationally a deductive aprioristic approach, there is an intersection between the two disciplines. The failure of mechanistic predictive economic modeling however has shown that the intersection does not include mathematics derived for mechanical physics, differential calculus, and the like, rather the intersection lies in formal logic and the foundations of mathematics. It is the aim of this work to fill in a gap in the body of literature of Austrian economics regarding the precise relationship between the discipline of formal logic (as a subset of mathematics) and economics. We will attempt to apply principles of foundational logic to the economic methodology of praxeology to develop a more robust version of the previously established political-economic theory. Gödel's incompleteness theorem in particular holds important ontological and epistemological implications to praxeology. Ontologically, we will see that the questions which ground the study of economics are anthropological and theological in nature. Epistemologically, we will see that there is not a single method for deriving such knowledge, rather a complex and interrelated system. The axioms arrived at through the systems theory method leads us to the humble presuppositions for constitutionalism. In informal terms, Gödel's incompleteness theorem blows a hole in normative praxeology, while systems theory patches it up. We will see that Mises' naïve and pragmatic approach to establishing foundational normative

axioms is seen to be consistent, while Rothbard's doctrinal stance leads us to wild inconsistencies.

1. Introductory notes

Throughout the course of my reflections during my undergraduate degree in mathematics, I was captivated by the epistemological underpinnings of the discipline. The fact seemed to repeatedly show itself that everything we know about mathematics relies on some prior assumptions or some more fundamental reasoning. It was shocking (and slightly unsettling) to learn that each formal proof starts with the word "assume." It became clear at a certain point that, at any level of mathematical analysis we were working on, we were merely developing models for something more fundamental. No matter how complicated and developed a theory might be, it remains a blurry reflection of the underlying reality.

Having had an elementary understanding of Austrian economic theory, I couldn't help but see some of the parallels between the methodologies of mathematics and economics¹, as well as its distinction from other scientific disciplines. A deeper study of praxeology and other methodologies of the economic discipline made it clear that there is a rich and fertile area of research into the proper mode of understanding the complex system that is society and all the economic activity within. Given the failure of methodological positivism in the economic sciences, as well as some of the limitations of knowledge by purely apriorist methods, I will attempt to build upon and

¹ Though I was unaware of it at the time, Carl Menger had already written about the conclusions I was formulating. In the introduction to his book, it reads "Menger does not draw from this insight the conclusion reached by Mises and Hayek that a basic distinction exists between the methods of inquiry and validation appropriate to social science and those appropriate to natural science. But this is not because, like some economists, he sees empiricism or positivism or falsificationism as the only proper method for both social science and natural science. Instead, he argues (p. 59 n. 18) that both the search for empirical regularities and the formulation of non-empirical, non-falsifiable ("ex-act") theories are methods common to both economics and such natural-science fields as chemistry. In viewing theoretical research in every field as having a non-empirical proposition at its core, Menger's position bears some resemblance to that of modern philosophers of science."

further compliment the foundation laid by Menger, Mises, Hayek, and Huerta de Soto, while providing a critique of Hoppean and Rothbardian normative methodology. Applying Gödel's incompleteness theorem, I will attempt to illuminate some of the problems in praxeology as well as develop a more comprehensive theory of human action.

Probably the most impactful of mathematics lectures I have attended were in a course on set theory taught by Professor Steven Bleiler of Portland State University². The axioms of Naïve Set theory, being an exemplary discipline of pure apriorist reasoning, is also the most bizarre and difficult to accept³. The difficulty arises in the absurdity of the axioms and the incredible utility of set theory as the foundation for all of computer science. To suppose that mathematics has any meaning at all and the act of doing set theory is an act of faith. Bleiler would regularly state "when you walked into this classroom you took a vow of faith to accept the axioms of ZFC set theory" and "if you do not accept the axiom of choice there is a nice seat waiting for you in the philosophy department." While I give praise to the a priori method of economics established by the original Austrians, it is not without reservations. Like set theory, the discipline of praxeology relies on unprovable axioms taken, to some degree, on faith. Unfortunately, the discipline of philosophy does not carry with it the same degree of certainty of the conclusion which we have come to love and expect in mathematics.

2. Economics as science

The discipline of economics is often erroneously thought to be a positive science in the same vein as the natural sciences such as physics and chemistry. Generally, it could be assumed that the methodology then is to formulate a hypothesis, conduct experiments which either confirm or conflict with the hypothesis, solidify a theory, and alter and revise as needed. The most fundamental problem with this approach is that the nature of the information sought in economics is entirely different from that of the natural sciences. While the

² Course taken in the Fall of 2015

³ As an example, consider Hilbert's Hotel.

natural sciences give us clear and accurate models of the physical properties and behaviors of material matter, economics seeks to build a model to comprehend human behavior. Moreover, the human behavior in question is not guided by distinctive physical properties such as gravity or biochemical reactions, but subjective values distinct to each individual. For this reason, the Austrian method is to apply a form of rationalism to the field of inquiry.

Ludwig von Mises, building on the work of Carl Menger, proposed methodological dualism for the study of human action. That is, the study of social phenomena (distinct from the historicist perception which is relativistic) which applies a purely theoretical axiomatic framework to interpret the raw historical datum. Later, Murray Rothbard wanted to apply this same sort of purely theoretical axiomatic framework to interpret ethical judgments of value. The error in this approach is both epistemological, and ontological. Epistemological — because the incompleteness theorem (and the structure of logic itself) tells us that the axioms (like the Action Axiom and the principle of self-ownership) are not demonstrable (formally knowable) without relying on prior assumptions. Ontological — because the foundation of such a system cannot be explained by his ontological naturalism.

Now, let's assume the metaphysical existence of certain properties like the Action Axiom indeed has some pragmatic value. We need to distinguish between propositions adopted as truth (based on experiential evidence) and necessary consequences within logical systems. There is a difference of certainty between a "safe starting point" and a necessary logical conclusion. To adopt, say, the Action Axiom is to conclude subjectively that the evidence is sufficient for faith in its truth value⁴. We logicians select our propositions on the basis of utility, evidence, or intuition. Whether or not a logical starting point such as the Action Axiom has some grounding in reality is immaterial to the provability of said axiom.

⁴ In classical logic, the axioms were considered self-evident and obvious. Euclid's parallel postulate for example, that no two parallel lines intersect was taken as a self-evident, obvious truth. That is, until parallel lines were transposed from the infinite plane to the sphere when it was realized that there are an infinite number of parallel lines which intersect (consider the longitudinal markings on a globe).

The study of human action remains a science which is divided between normative and positive components. That is, there are questions of how human beings should act and how human beings actually do act. Methodological dualism proposes that we provide a purely theoretical framework for interpreting historical facts of human behavior to understand the causal factors. The theoretical framework applied to actual facts of historical human behavior is quite different from that same framework applied to ethical theories. Given that, ethics are not concrete material events as are historical human actions, rather the theoretical discipline of determining how man ought to act. This is simply the attempt to apply a theoretical framework to interpret another theoretical framework. It merely transposes the problem at hand to another frame.

Hayek brought to the spotlight the evolutionary component of economic science, noting the continually evolving and emergent properties of money, language, and social rules. Curiously, he applied this evolutionary process explanation not just to social customs or material constructions, but also to judgements of value. If it is the case that ethical judgements of value came about through evolutionary processes, then the ethical values must also be continually evolving and cannot be said to be objective. While this is fine for the moral relativist, it presents a serious problem to the moral realist such as a natural law theorist.

Mathematics has frequently⁵ been cited by Austrian economists as a particular cause of confusion and error in economic theory. It may be of some surprise to the reader then that we are dedicating much study to the relationship between mathematics and the economic sciences. I wish to assure the reader that this is not a deliberate attempt to dismantle Austrian economic theory and replace it with the over-simplified static models of the likes of the neoclassical, Keynesian, or monetarists. Rather, our aim here is to determine the

⁵ For example, Mises wrote "The mathematical method must be rejected not only on account of its barrenness. It is an entirely vicious method, starting from fake assumptions and leading to fallacious inferences. Its syllogisms are not only sterile; they divert the mind from the study of the real problems and distort the relations between the various phenomena." (*Human Action* p. 347).

precise point of departure where economics diverges from mathematics and more exact disciplines on the knowledge continuum. The Austrian method is not mathematical, rather praxeological. The curious fact is that the method of praxeology is precisely the method of mathematics (namely deductive apriorist reasoning.) It is for this reason that the foundations of mathematics (the specialty field of Kurt Gödel) play an important role in our study of praxeology and political economic methodology.

Many of the epistemological problems that Mises identified are not only relevant to the social sciences and to economics, but more generally to logical disciplines. As mathematician Errett Bishop wrote "There is a crisis in contemporary mathematics, and anybody who has not noticed it is being willfully blind. The crisis is due to our neglect of philosophical issues."⁶ Here he is referring to the crisis that cropped up in mathematics which put the foundations of the discipline in jeopardy — the truth value of axioms themselves. He further wrote "As pure mathematicians, we must decide whether we are playing a game, or whether our theorems describe an external reality."⁷ The question therefore of the epistemological problems in economics are not exclusive to the study of economics, but to the study of mathematics itself and the discipline of formal logic on which it is founded.

The issue we will go on to investigate is the implications of these foundational problems in mathematics and logic, how they correspond to economics and praxeology, and what the implications are to specific economic theory within the Austrian school. In this chapter we seek to firmly establish the intersection between mathematics and economics so that we can examine the foundations of economic knowledge.

2.1. *A Priori logic and economics*

A priori logic is the method of choice amongst the Austrian scholars, differentiating themselves starkly from the positivist or

⁶ Dauben (1985).

⁷ Dauben (1985).

empiricist positions of their colleagues of the day (and indeed from the average economic scholar of our day). To continue this tradition of logical economics, of methodological individualism and of methodological dualism, we'll have to take a closer look at the structure of logic itself.

In his article, Steven Yates gives us the rationale behind employing logic as a principal instrument for economic inquiry. He points to several important reasons for applying logic to economics, principally because it is the only viable method for attaining universally valid rules. In the natural sciences, the rules we find are really nothing but highly consistent regularities of the behaviors of physical bodies. Unlike the "rules" which govern the natural world, the rules of human action are wholly distinct from the rules of nature in that the study is precisely that of *irregularities*. That is, when we examine the unfolding of the history of human society, it is characterized precisely by the instances in which behavior deviated from the previously established norm. Therefore, the method of praxeology must be distinct from the empirical method employed in the physical sciences. Yates writes:

"the particular philosophy of logic embodied in methodological apriorism and this account of causality invites both a devastating critique of empiricism as a comprehensive epistemology and promises a viable, equally comprehensive alternative."⁸

Thus, it is established that the proper mode of inquiry for discovering universally valid rules of human action (assuming such things exist) cannot be methodological positivism, empiricism, or relativist historicism.

There are then two fundamental questions (as stated in Yates' article) that arise with this observation:

- (1) What relationships between premises and conclusions guarantee that if the former is true the latter must be true?
- (2) How can premises be known to be true?

⁸ Yates (2005).

To answer (1), we can start by noting that logic and the correct rules of inference must exist. Mises dismantles any idea of polylogism by the observation that "The fundamental logical relations are not subject to proof or disproof. Every attempt to prove them must presuppose their validity."⁹ That is to say, it is absurd to try to disprove that logic exists or that it is relative to individuals or groups, for any attempt at disproving logic would have to use logic. Elsewhere Mises clarifies this position, writing:

"The *a priori* forms and categories of human thinking and reasoning cannot be traced back to something of which they would appear as the logically necessary conclusion. It is contradictory to expect that logic could be of any service in demonstrating the correctness or validity of the fundamental logical principles. All that can be said about them is that to deny their correctness or validity appears to the human mind nonsensical and that thinking, guided by them, has led to modes of successful acting¹⁰.

Mises, in many senses of the term, was a pragmatist. He was not so concerned with the profound questions of ultimate Truth, more so the practical implications of certain assumptions. According to him we can know that logic exists because the application of logic corresponds to reality. In particular, the use of logic in human action is the method by which each individual is able to forecast cause and effect, which leads to rational human action (that is, the purposeful aiming at definite ends). As human beings act as if rules of cause and effect are intrinsic to their being, it suffices to say that such a rule actually exists.

Question (2) raises a more fundamental question, the response to which Gödel's theorem has much to contribute. Shortly we will be discussing not just the epistemology of the premises, but the ontology of the premises. That is, not only our perceptions, but the theoretical possibility that our perceptions indicate something which is objective. In much the same way that using logic to disprove its own validity is absurd, it is equally absurd to use logic to

⁹ Mises (1949).

¹⁰ Mises (1957).

defend the premises on which it is built. A statement which is self-referential does not indicate its necessary truth, but it's necessary unprovability.

2.1.1. Postulate and axiom

The discussion of the foundations of logical systems is not new or unique to logical economics and in fact dates back to the Greeks. Most Greek mathematicians took their postulates to be self-evidently true¹¹ which, since the discovery (or invention, if you prefer) of non-Euclidean geometry, is considered widely amongst mathematicians to be a false assumption.

Mises, upon seeing this shift in understanding, was quick to distinguish the concept of propositional truth as it relates to praxeology from that of mathematics. He wrote:

“The assumptions of Euclid were once considered as self-evidently true. Present-day epistemology looks upon them as freely chosen postulates, the starting point of a hypothetical chain of reasoning. Whatever this may mean, it has no reference at all to the problems of praxeology.”¹²

The empiricist, he points out, has erroneously taken the mathematical understanding of an axiom (that is, unprovable and arbitrary) and applied it to the social sciences. He continues:

“The empiricist reaction against apriorism centers around a misleading interpretation of the non-Euclidean geometries, the nineteenth century's most important contribution to mathematics. It stresses the arbitrary character of axioms and premises and the

¹¹ Which philosophically is fundamentally important. This idea of a “self-evident truth” requires both an ontological and epistemological explanation, and the results of such a study have consequences on a societal level. The Constitutional principles of the United States for example are established on an ontological theism, and what could be described as epistemological liberalism. The “knowing” and “being” of political truths are of vital importance to the development of the society which it regulates.

¹² Mises (1962).

tautological character of deductive reasoning. Deduction, it teaches, cannot add anything to our knowledge of reality. It merely makes explicit what was already implicit in the premises. As these premises are merely products of the mind and not derived from experience, what is deduced from them cannot assert anything about the state of the universe. What logic, mathematics, and other aprioristic deductive theories bring forward are at best convenient or handy tools for scientific operations. It is one of the tasks incumbent upon the scientist to choose for his work out of the multiplicity of the various existing systems of logic, geometry, and algebra the system that is most convenient for his specific purpose. The axioms from which a deductive system departs are arbitrarily selected. They do not tell us anything about reality."¹³

In response to this problem, Mises offers his pragmatist approach to the discovery and application of axioms to the economic sciences. Mises did believe that the foundation of the logical system which comprises praxeology does have some experiential or observable basis. He wrote:

"The starting point of all praxeological thinking is not arbitrarily chosen axioms, but a self-evident proposition, fully, clearly and necessarily present in every human mind. An unbridgeable gulf separates those animals in whose minds this cognition is present from those in whose minds it is not fully and clearly present. Only to the former is the appellation man accorded. The characteristic feature of man is precisely that he consciously acts. Man is *Homo agens*, the acting animal."¹⁴

Mises, therefore, does not accept the premises of praxeology as self-evidently true postulates as the Euclidean geometers did, nor does he recognize them as merely conventionally accepted axioms as starting points chosen according to the purposes of the logical system. Instead, Mises grounds praxeological "axioms" on human action. Ostensibly, if the axiom cannot be verified or demonstrated by action, then it does not hold a positive truth value. In any case,

¹³ Mises (1962).

¹⁴ Mises (1962).

it is sufficient to note that man acts to establish the starting point of praxeology¹⁵.

Murray Rothbard was one who took this position out to its absurdity. For him, action was not only a pragmatic means for selecting axioms, but an altogether logical necessity which demonstrates Truth in an ultimate and universal sense. Rothbard asserts that a proposition ceases to be true only in the contemporary mathematical sense (that is, relative) when an attempt at its refutation presupposes its validity. He writes:

“a proposition rises to the status of an axiom when he who denies it may be shown to be using it in the very course of the supposed refutation.”¹⁶

For Rothbard, an axiom is necessarily universally true whenever it cannot be disproven. This idea says that any self-referential claim is necessarily false. As we will show later in the discussion of Gödel’s theorem, this is not the case. Self-referentiality is not necessarily an indicator of a truth value. It merely indicates indeterminability.

Economic positivist Milton Friedman held that premises need not be realistic to be acceptable for correct theorizing, writing that:

“Truly important and significant hypotheses will be found to have “assumptions” that are wildly inaccurate descriptive representations of reality, and, in general, the more significant the theory, the more unrealistic the assumptions.”¹⁷

Instead believing that the predictive power of the resulting models is what should be the determining factor.

“the relevant question to ask about the “assumptions” of a theory is not whether they are descriptively “realistic,” for they never are,

¹⁵ As we’ll see, this is quite different from the question of whether man should or should not act.

¹⁶ Rothbard (1982).

¹⁷ Friedman (1966).

but whether they are sufficiently good approximations for the purpose in hand."¹⁸

In a certain manner, this approach has had great success in mathematics and computer science. Take for example the axiom of infinity from set theory, which says that there exists an infinite set. That is, there exists a bucket for which you can put an infinite number of objects into. Such an idea is as markedly absurd as to say that there exists a closet which can accommodate an unlimited number of shoes. And yet, this principle is necessary for the formulation of the recursion principle, which in turn is essential to all of computer science. The notion of infinity is also as intuitive to the human mind as acting, but intuition can lead us astray. In mathematics and in *a priori* deductive sciences, the axioms selected do not need to have a true empirical basis as experienced or observed. However, the results are fully observable, experiential, and real, which should be an indicator of the applicability of the model.

We do not agree that human action is the ultimate determinant of propositional truth, nor do we agree with the positivist position that propositions in the social sciences need not have a basis in reality. Why should the method of the social sciences differ that other *a priori* disciplines? The answer that Menger identified was the disjoint connection between the exact orientation and the empirical orientation of the social sciences, and science in general for that matter. In his book section titled "The Relationship of the Exact Orientation of Research in the Field of the Social Sciences to the Realistic-Empirical Orientation," Menger writes:

"Nothing is so certain as that the results of the exact orientation of theoretical research appear insufficient and unempirical in the field of economy just as in all the other realms of the world of phenomena, when measured by the standard of realism. This is, however, self-evident, since the results of exact research, and indeed in all realms of the world of phenomena, are true only with certain presuppositions, with presuppositions which in reality do not always apply. Testing the exact theory of economy by the full empirical

¹⁸ Friedman (1966).

method is simply a methodological absurdity, a failure to recognize the bases and presuppositions of exact research.”

Which is to say that there is a clear distinction between theory and fact. Theory may be commensurate with fact, or it may not be. What is certain however is that fact cannot “disprove” theory, it can only indicate the appropriateness of the presuppositions and the model which they lead to. Menger goes on by saying:

“At the same time it *is* a failure to recognize the particular aims which the exact sciences serve. To want to test the pure theory of economy by experience in its full reality is a process analogous to that of the mathematician who wants to correct the principles of geometry by measuring real objects, without reflecting that the latter are indeed not identical with the magnitudes which pure geometry presumes or that every measurement of necessity implies elements of inexactitude. Realism in theoretical research is not something higher than exact orientation, but something different.”¹⁹

Menger is indicating here to us that in a certain sense, the presuppositions are necessarily imprecise and do not represent the whole truth. Using geometry as an example, the empirical verifiability of the postulates are impossible because the postulates lie in the realm of theory, while physical objects of course lie in physical reality. Thus, it is false to assume the axioms of praxeology to be universally valid. The best we can say about their truth value is that they are appropriate for the task at hand. However, it is equally false to say that the axioms need not have any basis on reality. The question is of their precision. Menger was rigorous in realizing the fact that theory is not fact itself, while Rothbard was overly presumptuous in supposing an exact one-to-one correspondence between the axioms and reality itself. While we do sympathize with the pragmatic understanding, we will show that it is not an altogether foolproof way of determining ultimate propositional truth.

¹⁹ Menger (1871), p. 70.

We'd like to point out here that, though the axioms are unprovable and relative to the problem at hand, this does not make them arbitrarily chosen without discretion. Though the mathematician chooses the axioms according to the results he wishes to attain, this does not make those choices arbitrary, rather subjectively based on a multitude of factors. The axioms of any logical system in the exact sciences are chosen subjectively, but never arbitrarily.

So, the Euclidean perception of the postulate as a universally true self-evident fact of reality is incorrect, both in mathematics and in praxeology. An *axiom* is the starting point for constructing any type of logical edifice. Regardless of the actual truth value or universality, the axioms are the statements which are, at a minimum, true by design. Axioms are simply the building blocks by which any logical system (or language) is constructed. They can be true or false, but it should be clear²⁰ that the antiquated conception of a universally true and valid postulate is false.

Having now a clearer understanding of just what an axiom is with regards to theoretical research, we can now begin to unpack and unravel what it means to say that an economic theory is "correct." Given this Mengerian distinction between theory and fact, let's examine some of the characteristics of a good theory.

2.1.2. *Objectivity and subjectivity*

The basic distinctions of objectivity and subjectivity are fundamental to the scientific pursuit. Barry Smith wrote a useful piece on this topic titled "Aristotle, Menger, Mises: an essay in the metaphysics of economics." In his essay Smith lays out the fundamental doctrines²¹ in this line of epistemology, namely:

- (1) The world exists, independently of our thinking and reasoning activities.

²⁰ We will show in the next chapter that by Gödel's theorem the truth value cannot be formally demonstrated.

²¹ These correspond to sections in the essay.

- (2) There are in the world certain simple 'essences' or 'natures' or 'elements', as well as laws, structures or connections governing these, all of which are strictly universal.
- (3) Our experience of this world involves in every case both an individual and a general aspect.
- (4) The general aspect of experience need be in no sense infallible (it reflects no special source of special knowledge) and may indeed be subject to just the same sorts of errors as is our knowledge of what is individual.

(1) refers to the objective reality that we suppose exists independent of our experience. (2) might refer to rules of logic, physical laws etc. (3) can be said to be the distinction between perception and reality. (4) is the humility bit which asserts the eradicable uncertainty. Only with this schema in place, we can critically examine the external world and each scientist can have the ability to compare their sense data to others'.

Much confusion can arise from theoretical inquiry when we confuse or poorly define the terms *objective* and *subjective*. Rothbard for example employed these terms very loosely and inconsistently, which in part magnified the errors in his conclusions. On moral philosophy, Rothbard wrote:

"One common, flip criticism by opponents of natural law is: who is to establish the alleged truths about man? The answer is not who but what: man's reason. Man's reason is objective, i.e., it can be employed by all men to yield truths about the world."²²

To say both that reason is "objective" and that its implementation yields "truths" about reality introduces a great vagueness into our discussion. In arguing that ethics are objective, he points to reason and at the very same time asserts that it is objective. Ostensibly, this is meant in the sense that a shovel is an object which is used to uncover other objects buried in the ground. One can certainly dig with the intent of discovering diamonds. One might find diamonds, or one could come across a rock and mistake it for

²² Rothbard (1982). p. 10.

a diamond. The objectivity of the shovel in no way guarantees that there would be a discovery of diamonds, or that the laborer won't mistake an ordinary rock for a diamond. It must be therefore that Rothbard (as other authors who are not careful) is supposing a type of "objectivity" which is to mean universally true or valid. This goes beyond the appropriate use of the term and can lead to wild misconceptions.

Objectivity and truth are not the same thing. Certainly, there exist objective statements which are not true. Take for example the statement "all bachelors are married." Clearly this is an objective statement and not a subjective personal preference or perception, but it is clearly false. The objectivity of a statement, assertion, or concept does not indicate its truth value. Likewise, subjective statements can be either true or false. For example, the statement "I like ice cream" could be true or false: it depends on the subject making the assertion. Subjectivity and objectivity are not synonymous with universal and relative truth, rather they are descriptors of the origin of the value judgment in question.

The proper distinction between subjective and objective is of particular importance in the study of economics. As has been discovered by economists, market prices are determined not by objective properties of goods, but by the collective subjective valuations of all actors in the market. Since human beings are subjects, we perceive all of reality through the lens of our subjective experience. We must have a way to distinguish our perception of absolute values, moral duties, truth, and so forth from the things themselves.

Furthermore, since the study of human action holds that peculiar position of being a study both *of* and *by* man, there is much humility required in our pursuit of truth. We ought to recognize our place among the cosmos and our limited capacity to comprehend ultimate reality and our place in it. As Michael Polanyi writes:

"if we decided do examine the universe objectively in the sense of paying equal attention to portions of equal mass, this would result in a lifelong preoccupation with interstellar dust, relieved only at brief intervals by a survey of incandescent masses of hydrogen—not in a thousand million lifetimes would the turn come to give

man even a second's notice. It goes without saying that no one—scientists included—looks at the universe this way, whatever lip-service is given to 'objectivity'"²³

Moreover, in the study of institutions and theoretical realities, the proper distinction between subjective and objective can help to clarify the distinction between the individual and the general. The general theory can be seen as objective, fixed and solid, whereas the individual is the particular instance as experienced by the economic actor. Menger writes:

"phenomena can be investigated from a double point of view, from the individual (the historical in the broadest sense of this word), and from the general (the theoretical). The task of the first orientation of research is the cognition of concrete phenomena in their individual nature and their individual connection. The task of the latter is the cognition of empirical forms (types) and of typical relationships (the laws of phenomena). It is concrete acts, destinies, institutions of definite nations and states, it is concrete cultural developments and conditions whose investigation constitutes the task of history and statistics, whereas the theoretical social sciences have the task of elaborating the empirical forms of social phenomena and the laws of their succession, of their coexistence, etc."²⁴

Thus, our definitions for objective and subjective are simpler and far more precise than often employed. We have structured the terms such that objective simply refers to an object while subjective simply refers to the observing subject. As one last example, a mountain is an object, and the mountaineers on it are the subjects. One's subjective perception of the mountain may be that it is majestic and beautiful. We would suppose that the mountain would exist even if there were no conscious minds to observe it, though its majesty and beauty would be irrelevant. So, when I make a statement such as to say that "moral duties are objective," I mean it in this sense. Like the mountain they exist independent of human minds. Also like the mountain, I can only perceive them and judge

²³ Polanyi (1958).

²⁴ Menger (1871).

their goodness through my subjective experience. The same can be said of each particular normative law.

2.1.3. Ontological and epistemological

Mises did very well to point out the epistemological difficulties of applying the methodology of the natural sciences to praxeology. Hayek, Rothbard, and others also made notable contributions as epistemologists. The philosophical rigor of these authors was important to understanding the differences in the methodology of economics vs. the natural sciences, and how we can come to know true facts about human behavior such as human action, supply and demand, and the purposeful aiming at definite ends of subjective value.

It is imperative however that we differentiate between the existence of phenomena and the possible means with which we might become aware of it. Most commonly, the Austrian economists wrote as epistemological rationalists. That is, the position that we can come to know true facts about the world through reason. Often, this rationalism is not only an epistemological theory, but bleeds over to an ontological belief that reason *is* reality itself for acting man. Mises believed that:

“it is consequently incorrect to assert that aprioristic insight and pure reasoning do not convey any information about reality and the structure of the universe. The fundamental logical relations and the categories of thought and action are the ultimate source of all human knowledge. They are adequate to the structure of reality, they reveal this structure to the human mind and, in this sense, they are for man basic ontological facts.”²⁵

It does in fact seem to be the case that certain logical relations and rules of inference (the law of excluded middle for example) do seem to be fundamental to human knowledge. What we may not say (in accordance with Mises' view) from this observation is that the logic currently in possession is anything but an evolutionary

²⁵ Mises (1949). p. 86.

adaptation subject to change. If there remains any sort of contingency on the basic structures of reality, then we cannot say that those structures are reality itself. No matter what the evolutionary function of logic or other fundamental mental structures of man, we have not arrived at a consistent ontology of the origin of truth, axioms, or universal basic laws of human behavior.

As previously mentioned, it would be foolish to suppose that reason does not guide us in discovering true facts about reality, for any argument against this intuitive notion would have to presuppose that reason could be a useful aid in the discovery of that fact. However, on naturalism, reason is a biological adaptation in man's struggle for survival, it cannot be said that reason provides any sort of ontological source or foundation of true normative facts.

Rothbard took the idea of ontological rationalism one step further and argued that facts cannot only be *known* by reason, but that they exist *because of* reason. This is indicated in Rothbard's work when he makes assertions such as "an objective ethics can be established through reason."²⁶ So ethics is not merely discovered using reason as a tool but established as some type of ontological basis for ethics. Ethics rests on reason, without reason there would be no ethics. The idea that reason can be more than a tool of discovery seems untenable.

One may object that this is a shallow or unfair reading of Rothbard's position. After all, he did write that the natural law is "a systematic order of natural laws open to discovery by man's reason."²⁷ Which indicates that he was not proposing reason to be a metaphysical foundation for natural law, rather a method of discovery. If this is so, then he seems to give no explanation for the existence of this natural law — no ontological foundation. What he is clearly asserting are the following two propositions:

- 1) That natural law exists objectively
- 2) That we need not posit a Creator to rationally arrive at that conclusion

²⁶ Rothbard (1982). p. 16.

²⁷ Rothbard (1982). p. 4.

If natural law exists objectively, and it simply exists by nature, there is a substantial burden of proof for the proponent of this position. For in light of the discoveries of Charles Darwin and his successors, we know that the law of nature is survival of the fittest — kill or be killed. Obviously this has nothing to do with some alleged private property rights.

Thus, reason alone is insufficient to establish²⁸ natural law. As we'll examine more fully in the next chapter, Gödel's theorem implies that if a system of ethics could be both established by reason and discovered by reason, we would have a complete and inconsistent system. If we posit ontological naturalism²⁹, then evolution, biology, or nature would be the source of ethics and hence would not be objective or fixed. If we are to posit objective ethics, then it would take an ontological supernaturalism to ground it. Reason is an incredible epistemological tool, but we ought not confuse the rocks with the shovel used to uncover them.

It is a false supposition that reason can establish the ontological foundation of reality, or even that reason can provide a formal and indisputable proof of the fundamental true facts about reality. As human beings with subjective experience, we do not have the capacity to view the world with the type of infallible objectivity of God. Just as in mathematics, the axiomatic basis for praxeology does not escape ontological uncertainty, and the foundations for any set of axioms should be well-founded.

For these reasons, it is essential that we differentiate between the study of knowing (epistemology) from the study of being (ontology) in our analysis of normative or ethical theory. As scientists, we attempt to view complicated phenomena objectively, this means comparing it with our subjective experience and the subjective experience of others. This does not mean that reason cannot be employed in developing sound arguments and formulating plausible assumptions, but the absolute ontological certainty of the axiomatic foundations of reality lies just beyond the scope of complete human comprehension.

²⁸ In the ontological sense.

²⁹ As both Rothbard and Mises did implicitly.

2.2. Chapter conclusion

This complicated relationship between mathematics, apriorism and the social sciences has been playing out in research since the birth of the Austrian School. For good reason, Mises and company were quick to differentiate between the type of apriorism of praxeology and mathematical *a priori* knowledge as interpreted by logical positivism. In Mises' words:

"The *a priori* knowledge of praxeology is entirely different— categorically different—from the *a priori* knowledge of mathematics or, more precisely, from mathematical *a priori* knowledge as interpreted by logical positivism. The starting point of all praxeological thinking is not arbitrarily chosen axioms, but a self-evident proposition, fully, clearly and necessarily present in every human mind."³⁰

He concludes that human action (distinct from animal action) is the self-evident, starting point and the foundation for all subsequent economic doctrine. While this may hold some weight from a pragmatic perspective, it does not stand up to pure logical demonstration. The unprovable apriorism of mathematics we hold demonstrates a certain quality which is inherent in all logical systems, including the theoretical framework for interpreting human action.

Mises' aversion to the positivist-empiricist view of *a priori* methods and the nature of the axiom is warranted. It is useful to note the differences between branches of knowledge and the epistemology that serves them. The idea was well formed when he wrote:

"The assumptions of Euclid were once considered as self-evidently true. Present-day epistemology looks upon them as freely chosen postulates, the starting point of a hypothetical chain of reasoning. Whatever this may mean, it has no reference at all to the problems of praxeology."³¹

³⁰ Mises (1962).

³¹ Mises (1962).

However, it is an exaggeration to say that the results have nothing at all to do with praxeology. If praxeology is a pure theoretical logical discipline, then the general structure of all logical edifices is absolutely relevant to our inquiry into praxeology.

We hold that the *a priori* structure of logic and the foundations of mathematics has very much to do with the *a priori* framework of praxeology, our understanding of the social sciences in general, and economics in particular. The ontological and epistemological basis for establishing the axioms is of fundamental importance to the generalized theory of human action. The present day understanding of the axiom is that of an unprovable starting point for the subsequently assembled logical structure. Whether pure mathematics, praxeology, or ethics, the axioms selected are done so according to the scientist for particular purposes and any attempt to formally prove their validity is in vain. This is what an axiom is so we'll have to work with it.

One of the difficulties and peculiarities of praxeology is the subjective nature of the object of study. That is, the object of study in praxeology are subjects themselves.

"Being himself a valuing and acting ego, every man knows the meaning of valuing and acting. He is aware that he is not neutral with regard to the various states of his environment, that he prefers certain states to others, and that he consciously tries, provided the conditions for such interference on his part are given, to substitute a state that he likes better for one he likes less."³²

The praxeologist is thus both a subject and the researcher of subjects. There are certain truths about the human experience which the social scientist can know by virtue of being a member of the same class of objects under consideration. This implies a certain type of *a priori* knowledge about acting man. This subjective experience of the praxeologist and the ability to extrapolate this information to the object of study however should not be equated with objective facts. It is quite possible that one's subjective experience, no matter how many other members of his group share the

³² Mises (1957). p. 283.

experience, are correct in their observation of the external world. It was once the case that all members of the human race experienced and perceived the earth as being flat. Given our present knowledge, this once obvious *a priori* assumption could be said to be objectively false. For this reason, the distinction between the subjective observer and the objective reality (independent of human minds and human experience) is essential to our mission.

Similarly, we also must distinguish clearly between the theory of knowledge (epistemology) and the theory of being (ontology). Epistemological theories of knowledge of any particular object are of course useless if the object in question does not exist or is of an entirely different nature than expected. This necessity to differentiate becomes obvious in the study of abstract concepts, most notably that of ethics or any sort of normative science. While some abstract objects are taken for granted as existentially true (such as numbers, sets and the rules of logic), a deeper ontological analysis is required for the more controversial matters such as justice and natural law.

The mathematical-*a priori* parallels in the positive sciences and the *a priori* structure of logical systems are unavoidable. It is therefore imperative that we study the nature of logic itself before attempting to develop a normative theory in the exact orientation. As the theoretical orientation of economic science relies on logic, consistency demands that we rigorously follow the rules of logic.

3. The incompleteness theorems

3.1. Kurt Gödel

Kurt Gödel (1906-1978), born in Austria was a mathematician working at the university of Vienna during an overlapping period as Ludwig von Mises. A mathematical prodigy, Gödel had acquired an undergraduate knowledge of mathematics before entering university. Initially intending to study physics, Gödel instead was captivated by mathematics and in particular the question posed in *Principles of Mathematical Logic* by mathematician David Hilbert. Namely, "Are the axioms of a formal system sufficient to derive every statement that is true in all models of the system?"

Though part of the logical positivist group known as the Vienna circle, Gödel was famously opposed to the empiricist movement taking place around him. Instead of giving into the dominant philosophical environment, Gödel maintained a fervor for *a priori* science and held strongly to this position. The mathematician Gregory Chaitin recently told a story of a distinguished physicist who sat down next to Gödel at a dinner party. Trying to make conversation with Gödel, he relayed some exciting new discovery from the research in the field of astrophysics. After telling of the results and waiting for the reaction, Gödel simply replied "I don't believe in empirical science I only believe in *a priori* truths."³³

Gödel's findings were the result of an explosion of ideas at the university of Vienna. Working in the same space as philosophers such as Karl Menger (Austrian economist Carl Menger's son), and Oskar Morgenstern³⁴, Gödel's contributions were likely influenced by, and influenced later theorists in the Austrian school of economics. His work has both profound and devastating implications to economic science. Gödel's view of mathematical logic, which we support here, was that it is "a science prior to all others, which contains the ideas and principles underlying all sciences."³⁵

3.2. *The proof and the theory*

Gödel's 1931 paper "On formally undecidable propositions of Principia Mathematica and related systems," was the culmination of his doctoral work and a groundbreaking discovery. In the paper, he set out to prove that there is no set of axioms such that all propositions in the system can be formally decided. In the introduction to his article, he writes of the problems leading up to his work and result.

"These two systems [Zermelo-Fraenkel axiomatic set theory and Principia Mathematica] are so comprehensive that in them all

³³ <https://www.youtube.com/watch?v=1RLdSvQ-OF0> 2:43

³⁴ Who's work also has relevance to Austrian economics. See Bagus, P (2011). *Morgenstern's Forgotten Contribution: A Stab to the Heart of Modern Economics*.

³⁵ Gleick (2011).

methods of proof today used in mathematics are formalized, that is, reduced to a few axioms and rules of inference. One might therefore conjecture that these axioms and rules of inference are sufficient to decide any mathematical question that can at all be formally expressed in these systems. It will be shown below that this is not the case, that on the contrary there are in the two systems mentioned relatively simple problems in the theory of integers that cannot be decided on the basis of the axioms³⁶."

Formulated using number theory, Gödel was able to prove that whatever set of axioms selected, there would always be true results which lie beyond the scope of formal proof within the system. The previously sought-after Hilbert program was shown to be a failed project.

Ernest Nagel and James R. Newman give a sufficient overview of the problem and results in their short book titled "Gödel's proof." They summarize the historical context and the result of his theorem:

"it was tacitly assumed that each sector of mathematical thought can be supplied with a set of axioms sufficient for developing systematically the endless totality of true propositions about the given area of inquiry. Gödel's paper showed this assumption to be false...the axiomatic method has certain inherent limitations, which rule out the possibility that even the ordinary arithmetic of the integers can ever be fully axiomatized."³⁷

So, not just mathematics, but the axiomatic method has certain inherent limitations. Though the original proof of this is quite technical, the idea can be grasped by those not specialized in formal logic or mathematics. Gödel's proof relies on a 3-part process:

- 1) First, distinguish between mathematical statements within arithmetic, such as $2+2=4$, and the meta-mathematical statement *about* arithmetic, such as ' $2+2=4$.' The former can be seen as a statement within the logical language, and the latter can be taken as a statement about the language.

³⁶ Gödel, *Collected Works* (1931), p. 145.

³⁷ Nagel, E., & Newman (1958), p. 6.

- 2) These mathematical statements, taken as tokens with a corresponding truth value, can then be mapped onto arithmetic. That is, there can be established a one-to-one correspondence between these tokens and arithmetic.
- 3) Using the concept of self-reference, it can be shown that there exist meta-mathematical statements which are not formally demonstrable.

To grasp the third, most crucial and abstract part of the proof, we can illustrate using an ancient paradox called the Epimenides paradox. Douglas Hofstadter explains it well:

“In its absolutely barest form, Gödel’s discovery involves the translation of an ancient paradox in philosophy into mathematical terms. That paradox is the so-called Epimenides paradox, or liar paradox. Epimenides was a Cretan who made one immortal statement: “All Cretans are liars.” A sharper version of the statement is simply “I am lying”; or, “This statement is false”... It is a statement which rudely violates the usually assumed dichotomy of statements into true and false, because if you tentatively think it is true, then it immediately backfires on you and makes you think it is false. But once you’ve decided it is false, a similar backfiring returns you to the idea that it must be true.”³⁸

The third step in the proof, being the crux of the argument, thus shows that there are certain philosophical paradoxes which cannot be proved and, since there is a one-to-one correspondence between these and arithmetic, there are paradoxes in arithmetic as well. So, it was shown using these concepts of meta-mathematics, mapping, and self-referential contradictions to show that a mathematical system (and this can be extrapolated to logical systems including praxeology), if consistent, cannot be complete. If we have a logical framework that is internally consistent, then there are necessarily components of that framework which are not formally demonstrable.

Some non-formally demonstrable statements are potential theorems, but most importantly the axioms themselves cannot be

³⁸ Hofstadter (1979). p. 25.

shown to be true. As in all exact orientations of science, such as in theoretical economics, we must rely on a set of formally indemonstrable axioms. No matter how “self-evident” a proposition may seem, we should not fall into the trap of believing that it is indisputably and irrefutably universally true. If ever we have concluded this of a given axiom, then the axiom in question is no axiom at all.

3.3. Epistemological consequences

The demonstrated incompleteness theorems, for our purposes, have at least³⁹ two things fundamental implications to:

- 1) The nature of axiomatic systems.
- 2) The nature of tacit knowledge vs. theoretical knowledge.

In the first place, it changed the way we see axiomatic foundations. The foundation which the geometers believed to be solid, immovable, and universally true is found to be a false assumption. There must be a type of explanatory stopping point in which the verification and explanation can continue no further. This has implications for the whole of the scientific endeavor.

For example, the results of this theorem provided a radical critique to the mechanistic and logical empiricist worldview. To those who were hoping to systematize the entirety of human knowledge, in the pursuit of what was known as “The Theory of Everything,” it served as a fatal blow to their pursuits. One such intelligent yet mistaken physicist attempting such a feat was Stephen Hawking. After years of pursuing and hoping for such an outcome, he admitted defeat after considering Gödel’s famous result.

³⁹ A third potential implication is the impossibility of artificial intelligence taking the place of the human economic actor. Given that the axioms are not formalizable and instead rely on certain tacit knowledge, it seems likely that any “acting” AI would require at least certain value inputs to function, therefore not truly taking the place of a human being. Nagel and Newman also tended towards this thinking as they wrote “there is no immediate prospect of replacing the human mind by robots.”

In his 2003 lecture at Texas A&M university titled "Gödel and the end of physics," Hawking admitted:

"Some people will be very disappointed if there is not an ultimate theory, that can be formulated as a finite number of principles. I used to belong to that camp, but I have changed my mind. I'm now glad that our search for understanding will never come to an end, and that we will always have the challenge of new discovery. Without it, we would stagnate. Gödel's theorem ensured there would always be a job for mathematicians."⁴⁰

And, I might add, it indicates that there will always be a job for economists. As much as classical, Keynesian, and Monetarist economists have tried to make rigorous every detail of the complex system, which is an economy, the attempt will necessarily fall short⁴¹. The same goes for the extreme rationalist attempting a complete formalization of a libertarian ethic. There will always be a component of uncertainty in the premises of any axiomatic logical system and there will always be unprovable propositions which rely on informal methods to argue for their validity. The perfect model of perfect competition and perfect information cannot be achieved.

In the second place, there is a direct implication to the structure of knowledge itself. The theorem does not say that there are merely mathematical truths that are yet undiscovered, it says that there are mathematical truths which are unprovable. That is to say, there are truths which, to the extent that we "know" them, cannot carry the same type of mathematical certainty which we are familiar with a purely logical structure. There will always be some component of faith within the logical edifice of any mind. Though tacit knowledge may be possible, theoretical knowledge is not always.

This unusual, informal type of knowledge seems to correspond to what authors like Polanyi referred to as "tacit" knowledge. We can know and understand certain principles which cannot be formally demonstrated. *Knowledge*, we see, is something that is more like *understanding*. Polanyi writes:

⁴⁰ Hawking (2003)

⁴¹ See *Socialismo, cálculo económico, y la función empresarial* by Huerta de Soto.

"The structure of tacit knowing is manifested most clearly in the act of understanding. It is a process of comprehending: a grasping of disjointed parts onto a comprehensive whole."⁴²

The fact that the axioms of any system, though perhaps not universally valid or provable, are comprehensible should give an indication as to which axioms ought to be adopted and to what measure. In society, tacit knowledge is often adopted as standards of conduct or cultural norms. Again, Polanyi writes:

"To hold a natural law to be true is to believe that its presence may reveal itself in yet unknown and perhaps yet unthinkable consequences; it is to believe that natural laws are features of reality which as such will continue to bear consequences inexhaustibly."⁴³

The epistemological uncertainty inherent in the structure of knowledge should not be used to discredit the discoveries within the social sciences. It is the process of theoretical inquiry to continually challenge and refine previously accepted assertions and foundational beliefs.

The structure of logical systems is an indication of the structure of knowledge itself, and therefore should not be discounted when dealing with epistemological problems of the social sciences. However, the impossibility of formalizing the rules of human behavior does not mean that a rigorous pursuit is without end, for

"the resource of the human intellect have not been, and cannot be, fully formalized, and the principles of demonstration forever await invention and discovery."⁴⁴

3.4. Ontological consequences

Apart from the epistemological problems that Gödel's result raises, it also sparks a certain ontological inquiry. It is not unreasonable to

⁴² Polanyi (1959), p. 28.

⁴³ Polanyi (1969).

⁴⁴ Nagel, E., & Newman, J. R. (1958). p. 101.

ask not only "how can we know," but also the question "how could it be so." For if the truth value of some theoretical object of examination is not formally demonstrable, it may very well be that the object does not exist at all.

Gödel was of the mind that though not theoretically demonstrable, theoretical objects do exist in some abstract world. This position is commonly called "platonic realism," which asserts that abstract theoretical objects do exist prior to their discovery.

"According to platonic doctrine, the objects of mathematical study are not found in the spacio-temporal order. They are disembodied eternal forms accessible only to the intellect."⁴⁵

These disembodied eternal forms are not unlike the ethics described by natural law theorists. It seems necessary, given that every system relies on unprovable axioms, and our knowledge of the validity of these axioms comes from another set (the set of all tacit knowledge), that ethics must exist in some sort of superset to that of our objective physical reality. This therefore raises the questions of what this superset is, where it is located, what other sorts of things does it contain? And perhaps most importantly, what is the origin and source of such metaphysical objects? It is not enough to merely refer to bio-socio-cultural institutions if there is something fundamentally true about normative objects. There are theological inquiries which should be explored.

The ontological reality is of utmost importance to the study of praxeology and economics in that there must be a theoretical foundation to justify the axioms which support the whole edifice of the *a priori* structure. Incompleteness opens the door to what would otherwise be a moot question for the study of axiomatic disciplines.

3.5. Consequences for normative praxeology

With respect to the study of human action, the theorems hold significant weight for at least two reasons.

⁴⁵ Nagel, E., & Newman, J. R. (1958). p. 99.

- (1) Incompleteness implies that the axiomatic foundations of praxeology must rely on information sources other than pure logic. Instead of a complete and consistent framework, we aim for a consistent and incomplete framework. It may be that the axiomatic foundations we choose to accept are chosen from some higher order set or system.
- (2) Self-referential contradiction does not supply a proof of validity of an assumption. That is to say, the performative contradiction is insufficient to determine the truth value of a potential axiom.

To address the first point, I'll refer to Hayek's work titled *The Sensory Order*. In this work Hayek addresses both the nature of information and the manner by which humans process and understand it. He wrote:

"We thus possess 'knowledge' about the phenomenal world which, because it is in this manner implicit in all sensory experience, must be true of all that we can experience through our senses. This does not mean, however, that this knowledge must also be true of the physical world[.]"⁴⁶

This phenomenological sensory experience might give an indication of some validity to the concept, but it is by no means a proof of any physical reality. It might provide a clue about the nature of the foundations of a praxeological systems in that it would be pragmatic to adopt the axiom, but it would not be an absolute and universal necessity of adoption. There is information which we can perceive and process, while not in a formal sense, but in such a way as so that it can be comprehensible to formulate the initial conditions or values. The foundations of normative human action may be some such perceptual tacit knowledge.

Within the theoretical framework by which all past events are interpreted and evaluated, there is a hierarchy of information from which we must choose. The cohesion or consistency of the knowledge in question must be passed through the filter of perception, which

⁴⁶ Hayek (1952), p. 168.

includes more than plain reason and indisputable objective facts. Writing on the limits of explanation, Hayek says that there exists:

“an absolute limit to what the human brain can ever accomplish by way of explanation—a limit which is determined by the nature of the instrument of explanation itself, and which is particularly relevant to any attempt to explain particular mental processes.”⁴⁷

The existence of an explanation for any rule, regularity, or apparent law has a necessary limit. For explanations of every phenomenon, at any point in time there will be what is considered a “best explanation.” The human brain can only comprehend truth up to a certain breaking point. It seems that incompleteness is analogous and parallel to this fact of perception. As Douglas Hofstadter wrote:

“All the limitative Theorems of meta-mathematics and the theory of computation suggest that once the ability to represent your own structure has reached a certain critical point, that is the kiss of death: it guarantees that you can never represent yourself totally.”⁴⁸

Or, as Ludwig M.P. Van den Hauwe wrote in his article *Hayek, Gödel and the case for methodological dualism*:

“It would thus appear that Gödel’s theorem is but a special case of a more general principle applying to all conscious and particularly all rational processes, namely the principle that among their determinants there must always be some rules which cannot be stated or even be conscious.”⁴⁹

Thus, it seems that the rules which ground knowledge of human action cannot be explicitly formalized. The self-referential character of performative contradictions is insufficient grounds for explaining away a given claim. The foundations for praxeology still rely on literary methods.

⁴⁷ Hayek (1952), p. 185

⁴⁸ Hofstadter (1979) p. 692.

⁴⁹ van den Hauwe (2011).

The explanation of point (2) is in the following subsections.

3.5.1. Argumentation ethics

To elaborate on the second point, we are referring to the possibility of performative contradiction being sufficient grounds for establishing the truth value of a particular claim. For example, in his attempt to establish the validity of the premise of self-ownership, Hans-Hermann Hoppe claimed that the self-refutational nature of supposing otherwise is sufficient for its universal validity and acceptance. In this particular case, he argues that the principle of self-ownership must be valid since any attempt to refute this argument would be an exercise of the rights of self-ownership. He states:

“The truth or validity of the norms or rules of action that make argumentation between a proponent and an opponent at all possible — the praxeological presuppositions of argumentation — cannot be argumentatively disputed without falling into a pragmatic or performative contradiction.”⁵⁰

So, in the act of arguing against self-ownership (or presumably the act of arguing at all) presupposes it. But, as has already been established in the field of pure logic, self-reference does not negate or prove the truth value of a claim. The assumption that must be true in order for it to be false is precisely the type of indemonstrable claim in the Epimenides paradox. This apparently self-evident proposition, whatever its validity might be, has not been irrefutably demonstrated.

In fact, it was similar reasoning that the early geometers used in order to justify their postulates. It must be for example that two parallel lines do not intersect, for it would be absurd otherwise. However, this is only true on an infinite plane, which as we know is an object that does not exist in reality. We see here that the

⁵⁰ https://www.youtube.com/watch?v=b8UE3QAV8JM&list=PLPsGN9FqH-c8GUy2YSvvsz_9AwOBS6irJs

praxeologist Hoppe has fallen into the same trap as the ancient geometers. As we have learned from the mathematicians of the 19th century leading up to Gödel's conclusion. Nagel & Newman wrote:

"The traditional belief that the axioms of geometry (or for that matter, the axioms of any discipline) can be established by their apparent self-evidence was radically undermined."⁵¹

Self-referential contradiction is not self-evidence for the validity of a statement. If it is the case that self-ownership is a normative objective reality, the proof has yet to be demonstrated.

Hoppe, as an extreme rationalist⁵², argued from the perspective of a libertarian and anarcho-capitalist that self-ownership, as an absolute and universal fact, must be true based on the self-referential performative contradiction of any attempt to refute the fact. His argument concludes:

"Any argument to the contrary: that either the proponent or the opponent is *not* entitled to the exclusive ownership of his body and all prior possessions cannot be defended without falling into a pragmatic or performative contradiction. For by engaging in argumentation, both proponent and opponent demonstrate that they seek a peaceful, conflict-free resolution to whatever disagreement gave rise to their arguments. Yet to deny one person the right to self-ownership and prior possessions is to deny his autonomy and his autonomous standing in a trial of arguments. It affirms instead dependency and conflict, i.e., *heteronomy*, rather than conflict-free and autonomously reached agreement and is thus contrary to the very purpose of argumentation."⁵³

Essentially claiming that, when one argues he asserts his belief in the right to self-ownership and all prior possessions and thus finds himself in a peculiar contradiction in which he is arguing

⁵¹ Nagel, E., & Newman, J. R. (1958). p. 11.

⁵² For example, see "In Defense of Extreme Rationalism"

⁵³ <https://misesuk.org/2016/10/09/hans-hermann-hoppe-the-ethics-of-argumentation-2016/>

against the justification of the very means with which he is using to make his point.

As Robert Murphy put it in his critique of argumentation ethics:

“Hoppe pursues the ancient goal of removing all contingency and uncertainty from reasoned political discourse, making the conclusions reached by that activity logically demonstrable, rather than merely persuasive.”⁵⁴

Indeed, sociological complexity is not like the results of pure mathematics. To argue for a true ethical system still requires persuasion. The epistemological methodology for discovering first principles is unlike the purely logical and exact orientation of discovering the necessary consequences.

3.5.2. Rothbardian ethics

Rothbard, who had been arguing for the libertarian principle of absolute self-ownership for decades, was ecstatic about this result:

“In a dazzling breakthrough for political philosophy in general and for libertarianism in particular, he has managed to transcend the famous is/ought, fact/value dichotomy that has plagued philosophy since the days of the scholastics, and that had brought modern libertarianism into a tiresome deadlock. Not only that: Hans Hoppe has managed to establish the case for anarcho-capitalist-Lockean rights in an unprecedentedly hard-core manner, one that makes my own natural law/natural rights position seem almost wimpy in comparison.”⁵⁵

As a direct application to this extreme rationalism applied to praxeology and ethics, we can see where Rothbard was led in this pursuit. Particularly telling, and often overlooked by his modern-day followers, was his shocking results obtained in the study of child ethics. Let’s first consider abortion.

⁵⁴ Murphy, R. P., & Callahan, G. (2006).

⁵⁵ Kinsella, S. (2011, May 27).

Parting from the praxeological axiom of action, Rothbard deduces that each man has a right to property rights, first and foremost to his own person and the right to defend against any unwanted aggressions. Since the mother of a fetus then has this right over her own body, the growing child within her womb is acting as an aggressor and so she has the right to defend her body by abortion at any point of the pregnancy until the newborn baby and the mother cease to have physical contact. With respect to abortion, Rothbard defines a human life as a separate and independent individual, as opposed to a parasite which is dependent on other persons. Every separate individual has (negative) rights and is free by nature. The freedom of a pregnant mother clearly trumps that of the fetus since the fetus is not a separate individual. In his own words:

"The proper groundwork for analysis of abortion is in every man's absolute right of self-ownership. This implies immediately that every woman has the absolute right to her own body, that she has absolute dominion over her body and everything within it. [...] Any laws restricting or prohibiting abortion are therefore invasions of the rights of mothers."⁵⁶

Elsewhere, he compares the fetus to a parasite which "feeds unilaterally by exploiting the labor and energy of other men. Here is clearly a complete violation of any kind of universal ethic."⁵⁷

This misapplication of the rationalist methodology, when rigorously applied and taken to its ends, leads to various absurdities. Perhaps the reason this is the case is because the purely rationalist deductive methodology neglects various key considerations. First, Rothbard does not address the fact that the child in question is conceived and born involuntarily. By his own reasoning, the act of giving birth constitutes an aggression against another individual⁵⁸, which then should permit the baby the right to seek retributive justice.

⁵⁶ Rothbard (1982), p. 98.

⁵⁷ Rothbard (1982), p. 50.

⁵⁸ He does not consider the fetus an individual, but once the baby is born and free from the mother, it is then a self-owning individual. It may be that the non-individual was perfectly happy not being human. It may be that the non-individual was content

Second, there is a clear contradiction in this system which goes as follows: Since every man is a self-owner, each man is also the rightful owner to the fruits of his labor. When a man and a woman come together, they are clearly exerting their own resources in the act of conceiving that child. The labor⁵⁹ and cost put forth⁶⁰ thus constitutes ownership rights to the fetus and hence to the baby. But, since Rothbard asserts that the born baby has self-ownership, it cannot be that the parents are also the rightful owners to the baby. This constitutes a contradiction and invalidates the premises. We can more clearly see this contradiction in its syllogistic form.

FIGURE 1

<i>Step</i>	<i>Argument</i>	<i>Principle</i>
1 Premise	Each person has exclusive right to his own body.	Rule of self-ownership
2 $\Rightarrow$	Each person has absolute and exclusive rights to the fruits of his labor.	Rule of first appropriation implied from 1
3 $\Rightarrow$	A child is the result of the fruits of a man's labor.	Direct implication from 2
4 $\Rightarrow$	Therefore, the parents have exclusive rights to the child.	Direct implication from 2 and 3
5 $\therefore$	But the child cannot be both a self-owner and the property of the parents. Contradiction.	Conclusion

Clearly something is amiss in the ontology of the premise. If ownership is the result of first appropriation, then it is the biological parents who are the rightful owners of their children. But if

without self-ownership. As an illustration, if someone wants to give me a new car and I refuse it because I don't wish to have the liability of car ownership, it would be a crime to transfer title to me by forging my signature and forcing the keys into my pocket. In the same way, the act of the parents forcing self-ownership onto a non-self-owner would constitute an act of aggression.

⁵⁹ Also, interesting to note the act of giving birth is called "labor."

⁶⁰ Let's call it mixing labor with resources, or Lockean Homesteading.

children are owned by their parents, it cannot also be that they have self-ownership. So, it has been shown that ethical system containing the rule of self-ownership and the principle of first appropriation has internal contradictions. Does this mean that the principle of first appropriation is wrong? Does it mean that self-ownership doctrine is incorrect? We propose that neither of these is accurate. What this shows is the inherent limitations of the axiomatic method in dealing with complex issues such as ethics, law, and natural rights. Most likely it could be said that both rules are objectively true in a particular context, but not without bounds.

Related to this error is another absurd result obtained by Rothbard based on the self-ownership principle. This says that it is legally justifiable that a parent leaves their infant child to starve to death.

"the parent should not have a to feed, clothe, or educate his children, since such obligations would entail positive acts coerced upon the parent and depriving the parent of his rights. The parent therefore may not murder or mutilate his child, and the law properly outlaws a parent from doing so. But the parent should have the legal right to feed the child, i.e., to allow it to die."⁶¹

This type of obvious barbarism, though not logically inconsistent so long as we accept his previous results, implies what might be called an *experiential absurdity* or *experiential contradiction* — that intuitive sense that allowing a helpless child to starve to death is wrong and should be prohibited. But perhaps more importantly, this conclusion leaves no room for any nuances of the particulars. For instance, if I became aware that my neighbor was allowing their children to starve to death, I would be completely justified in entering their home in order to save the child's life⁶². By extension, I would also be justified in employing a third party to do the job for

⁶¹ Rothbard (1982), p. 100.

⁶² Notice that I have *not* made a universal generalization, but a circumstantial or conditional statement. Conditional ethics means that if circumstances A occur, then B is justified. Entering a private residence is of course only justified given the circumstances. What I *have* done is made a statement about objective ethics. I have said that it is not merely my subjective opinion that the action would be justified, but it would be justified

me. In the non-anarchical society, this third party would likely be a police officer or public servant. Thus, there is clearly legal justification for “violating” property rights in certain instances. Under Rothbard’s extreme rationalist *a priori* framework, this is unquestionably considered an act of coercion. Under the extreme rationalist framework, there can be no exception to the particulars.

Thus we conclude our discussion of the applications of the incompleteness theorem to Rothbardian ethics. The problem with such an attempt to logically construct a complete and consistent absolute eternal and objective ethic has been shown to be false by the implications of the incompleteness theorem (and by classical logic) on at least two accounts which can be summarized as follows:

- (1) Unjustified means can be used to attain just ends. We saw this illustrated in the example of the starving child. There can be instances when rules of ownership can be violated in order to attain less-bad outcomes⁶³.
- (2) The type of performative contradiction which involves self-reference does not imply a logical fallacy. As we have seen the rule of self-ownership to fail within Rothbardian ethics, it must be that the Hoppean performative contradiction argument is not an absolute proof.

Rothbard has, like many logicians before him, fallen into the never-ending self-referential trap of completeness and consistency. His error was to attempt the Hilbertian formalist construction of human action⁶⁴. The attempt to discover objective ethical truths must entail a full examination of the contingencies of such truths.

in a more real sense. It’s important here to distinguish the difference between universal (exists everywhere and always) and objective (exists regardless of human minds).

⁶³ Let the reader not fall into the slippery slope fallacy by saying that the “greater good” or “justified means” are determined by the coercive state. Not all acts of state intervention which use this rationality are justified.

⁶⁴ There will no doubt be some objections to this statement. Rothbard was, after all, against the use of formal logic in his formulations of economic theory. What we are referring to here is his insistence on a finite set of objective, universal, immutable, and eternal premises from which all of political theory can be derived (see footnote 2. on page 3 of the *Ethics of Liberty*)

3.6. *Chapter conclusion*

Gödel's incompleteness theorem, for being such a revolutionary discovery in logic, is alarmingly underrepresented and under taught. The implications it has to the philosophy of science is enormous, and we would do well as Austrian economists to understand it more fully and to take it into account when performing theoretical economics. The exact orientation demands a sound understanding of the tools we are working with, both their power and their limitations. Both the epistemological and the ontological should be considered when formulating methodology, particular in the investigation of ethics.

Mathematics, being the most useful tool for scientific discovery available, is not only analogous to the real world, but it also tells us something about the structure of reality. Gödel's result holds implications to all areas of scientific research which contain an exact orientation, including economics and ethics.

All of this is to say that we have not escaped the Misesian pragmatism for the foundation of praxeology. On both the *is* and in the *ought* side of the debate, we can only know and perceive facts about reality in so far as we can comprehend them. As flesh-and-bone human being economic actors, our comprehension does not rely solely on rationality. As demonstrated by Gödel's incompleteness theorem, the justification for the axiomatic foundation of the theoretical framework of praxeology cannot be demonstrated by principles within the system. Literary methods and persuasion still remain the foundation for rational discourse when formulating the basis for the exact orientation of social theory.

4. **Systems theory**

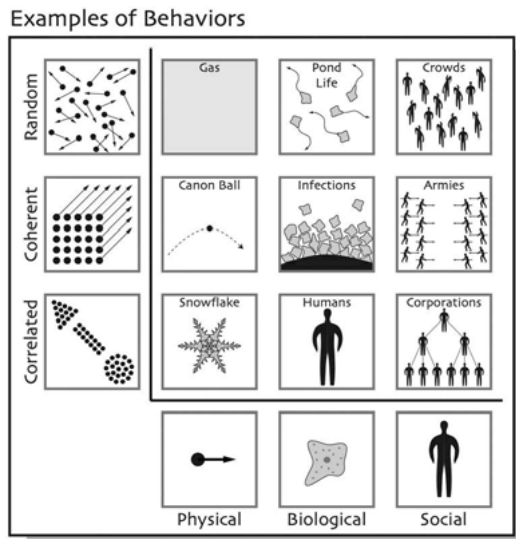
The incompleteness theorem then raises a very important question: if the axioms of the system cannot be demonstrated formally, and the shaky notion of a "self-evident" proposition is insufficient, then by what method are we to arrive at true premises? In this chapter, I wish to propose systems theory as an epistemological tool as the basis for explaining and understanding the foundations

of praxeology. What we have learned from the incomplete axiomatic method of understanding complex systems such as ethics is that a multi-scale approach needs to be implemented for understanding the various levels of societal interactions. In order to understand the whole of a complex system, we need to examine not just the parts and not just the whole, but each and both.

Polanyi writes of the tacit comprehension in understanding systems of various components:

“scientific discovery cannot be achieved by explicit inference, nor can its true claims be explicitly stated. Discovery must be arrived at by the tacit powers of the mind, [...] when we recognize a whole, we see its parts differently from the way we see them in isolation... within a whole its parts have a functional appearance which they lack in isolation and that we can cause the merging of the parts by shifting our attention from the parts to the whole.”⁶⁵

FIGURE 2⁶⁶



⁶⁵ Polanyi (1969).

⁶⁶ Siegenfeld, A. F., & Bar-Yam, Y. (2020).

In this way, systems theory is a lens which looks at complex phenomena at its various levels. In the traditional scientific method of the natural sciences, categories are grouped according to their material properties e.g., physical, biological, or social. In systems theory, they might be grouped by their position on the chaos/order continuum e.g., random, coherent, or correlated. In the following diagram, we see how traditional methods might group these things according to column, while complex systems science might group them by row.

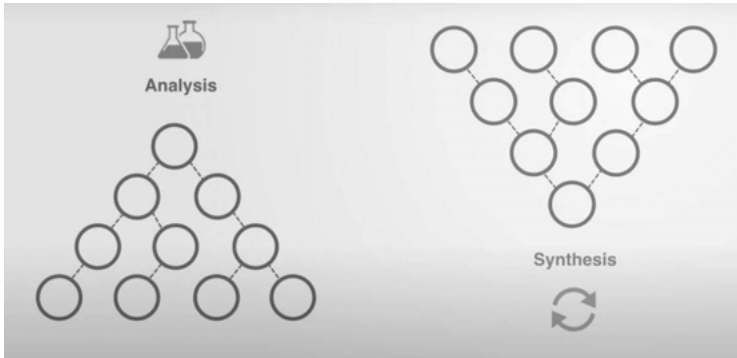
From this perspective, humans have more in common with the hierarchical structure of corporations than we do with pond life. Given the purposeful behavior of human beings, this is more commensurate with the praxeological understanding of human action.

When formulating a model, systems thinking aims for a synthesis rather than an analysis. That is, instead of a top-down analysis of complex systems, such as social institutions, by breaking it down into its constituent elements, we try a bottom-up approach. To understand complex social phenomena, we need to start with the human actor, but it is insufficient to study the human being in isolation, rather, we should look at the environment and context which he inhabits.

"Analysis is the traditional method of reasoning taken within modern science whereby we try to gain an understanding of a system by breaking it down into its constituent elements. On the other hand, synthesis, which is the foundation to systems thinking, works in the reverse direction, trying to gain an understanding of an entity through the context of its relations within a whole that it is part of."⁶⁷

This paradigm is immediately applicable to the theory of social institutions and solves many of the problems associated with the strict *a priori* approach to the study of ethics. Social rules which arise seemingly from spontaneous order are best seen in the context of multidimensional and multicomponent complex societal structures. Thus, when investigating phenomena such as family or child ethics, we can look at the behavior within the context of a greater whole.

⁶⁷ <https://www.youtube.com/watch?v=Miy9uQcwo3U>. 0:35-1:00.

FIGURE 3⁶⁸

4.1. *Complexity and incompleteness*

Before going on to discuss systems theory in more detail, it is necessary to briefly justify the connection between complexity and incompleteness. This connection was made formal by mathematician Gregory Chaitin. In the paper “Is complexity a source of incompleteness?” the authors write that:

“Chaitin’s complexity-theoretic proof of Gödel’s Incompleteness Theorem shows that high complexity is a sufficient reason for the unprovability of infinitely many (true) sentences.”⁶⁹

There are two ways that this result can be used in relation to the study of ethics: either the theoretical exact orientation, or the social evolutionary view. The first way is to look at the exact orientation within the study of ethical ethics systems. If we can consider theoretical ethics to be either a simple system such as the structure as mathematics i.e., rules of logic, axioms, and theorems, or we can look at it as a complex system, i.e., more than the sum of its parts and non-formalizable. If we consider the theoretical system of ethics one which cannot be easily broken down into its constituent

⁶⁸ <https://www.youtube.com/watch?v=Miy9uQcwo3U>

⁶⁹ Calude, C. S., & Jürgensen, H. (2005).

components. Either way, it is incomplete, either by the original formulation of the incompleteness theorem or by this complexity proof of incompleteness.

The second way is the view of ethics as an evolutionary social science. Given the complexity of societal structures, it is a simple parallel to draw between the complexity of theoretical complexity and concrete real world societal complexity. If we view society as a complex system itself, rather than a theoretical abstraction, we can say that it is incomplete, which is to say that a formalized model of society is beyond the realms of possibility⁷⁰.

It is the working hypothesis of this paper that ethics, being a complex system, thus has an unprovable number of true statements. Among these potentially true statements will be the axioms themselves. The formal unprovability of the ethical system does not imply non-objectivity or incomprehensibility.

4.2. What is system theory and its relation to Austrian economics?

Systems theory has only taken hold in recent decades, and it offers a promising new perspective on complex phenomena. Systems thinking could prove itself to fill the epistemological rift in the study of economics which was discovered and elaborated by Menger and Mises. Seeing as the positivist conception of social sciences does not provide an adequate framework for understanding complex phenomena, and the pure rationalistic approach fails likewise, systems theory has the potential to fill the methodological gap.

"Systems science emerged from interdisciplinary studies and is characterized by a diversity of perspectives, foci, and approaches.

⁷⁰ Though not formalizable, this is not to say that a comprehension of human society is impossible. It is the difference between tacit knowledge and technical knowledge. Furthermore, this has ontological and theological implications. If all human behaviors were the result of social construct, then we would expect it to be fully explained in simple terms. However, it appears that the origin of certain human and societal behaviors are not society itself (namely ethical rules of conduct). Therefore, we should expect some higher order phenomenon to explain it, such as God.

Systems science is not a discipline, per se, but a meta-discipline or field whose subject matter—organized complexity—can be applied within virtually any particular discipline. Systems science has become the broader scientific area that embodies all the thinking and practices derived from, and related to, advances in systems theory, methodology, and philosophy.”⁷¹

Systems theory is not (as some Austrian puritans might object) another attempt at oversimplification and reductionist methods to arrive at neat models to describe complex social phenomena. Rather, it is a methodology aimed at building models which are plainly recognized as models and serve as aids to comprehending human action on the institutional level. Systems thinking seems to fit the Austrian paradigm of institutions.

“A system is a set of interconnected components that form a whole and show properties that are properties of the whole rather than of the individual components. This definition is valid for a cell, an organism, a society, or a galaxy. Therefore, as Joanna Macy expressed it, a system is less a thing than a pattern. Systems thinking uses the concept of system to apprehend the world.”⁷²

Furthermore, as in Austrian economic theory, there is a clear distinction between specialized knowledge and general knowledge.

“General systems theorists acknowledge that specialized knowledge is as important as a general and integrative framework”⁷³.

Systems theory is also compatible with the ideas proposed by Mises of methodological dualism: that in order to understand human action (historical data) it is necessary to have a purely theoretical framework to interpret data. One introductory article on complexity directly agrees with this premise:

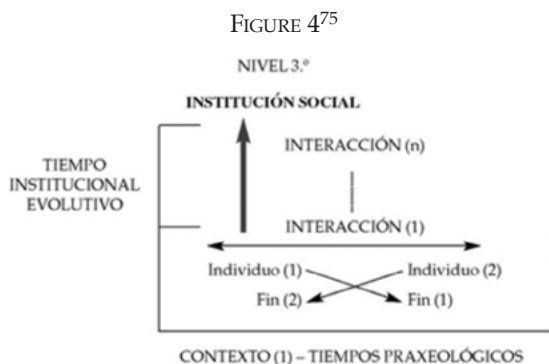
⁷¹ LASZLO, KATHIA CASTRO “Systems Theory”. Encyclopedia of Science and Religion. Retrieved August 17, 2021 from Encyclopedia.com: <https://www.encyclopedia.com/education/encyclopedias-almanacs-transcripts-and-maps/systems-theory>

⁷² Ibid.

⁷³ Ibid.

"Empirical studies, while useful, are by themselves insufficient, since all experiments require a theoretical framework in which they can be interpreted. While many such frameworks exist for understanding particular components or aspects of systems, the standard assumptions that underlie most quantitative studies often do not hold for systems as a whole, resulting in a mischaracterization of the causes and consequences of large-scale behavior."⁷⁴

In addition to its compatibility with methodological dualism, systems theory agrees with the multiscale analysis performed by social evolution theorists including Hayek. As this diagram which Dr. Meseguer depicts,



there are at least three different levels of human action: the individual, the interpersonal, and societal. Each related yet distinct and requiring their own particular methodology of inquiry.

Hayek himself seemed to anticipate such a field of systems theory in his work. Writing in his book *The Sensory Order*. In the section titled "The Limits of Explanation" he discusses the problems involved in building models of such complexity. He writes:

"The proposition which we shall attempt to establish is that any apparatus of classification [like the human mind] must possess a

⁷⁴ Siegenfeld, A. F., & Bar-Yam, Y. (2020).

⁷⁵ Meseguer, C. M. (2006).

structure of a higher degree of complexity than is possessed by the objects which it classifies; and that, therefore, the capacity of any explaining agent must be limited to objects with a structure possessing a degree of complexity lower than its own."⁷⁶

Which is in support of the theoretical impossibility of central planning. He goes on to describe the theoretical problems of such a conception.

"An apparatus capable of building within itself models of different constellations of elements must be more complex, in our sense, than any particular constellation of such elements of which it can form a model, because, in addition to showing how any one of these elements will behave in a particular situation, it must be capable also of representing how any one of these elements would behave in any one of a large number of other situations. The 'new' result of the particular combination of elements which it is capable of predicting is derived from its capacity of predicting the behavior of each element under varying conditions."⁷⁷

What he alludes to is a kind of model which describes not only the mechanistic working that contains the predictive capacity of various subsystems⁷⁸, but also a model which would be able to predict all possible counterfactuals of said subsystems and the system as a whole. Such a model would have to be *more complex* than the phenomena which it describes. Thus arises the theoretical problem of complex systems modeling. What we need is a type of 'model' which describes such impossible models. For this reason, such notions as spontaneous order and emergence are recurring themes of systems theory.

Now that we have provided a cursory overview of the basics of systems thinking and the justification of the application of systems

⁷⁶ Hayek (1952), p. 185. It should also be noted that this idea bears a striking resemblance to the Chaitin heuristic principle: "the theorems of a finitely-specified theory cannot be significantly more complex than the theory itself."

⁷⁷ Ibid., p. 188.

⁷⁸ One of the examples Hayek uses is an ocean wave. We can think of the wave as the system and the molecular interactions of water molecules as the subsystem.

theory to the Austrian school, we can go on to examine some of the various particular aspects of the discipline.

4.2.1. Chaos

Chaos theory, being one of the defining themes of the discipline, is “a scientific principle describing the unpredictability of systems.”⁷⁹ This unpredictability, I would add, could be of two types: either natural or conscious. A natural chaos would be unpredictable simply due to the number of variables and our technical or psychological incapacity to understand it. There need not be a more fundamental (ontological) problem of the nature of the subject of study. A conscious chaos however is distinct in that it is composed of consciously acted individuals with subjective values and purposeful behavior.

One example of a natural chaos might be the earth's atmosphere. Though it is incredibly technically difficult to predict, and likely will never be precisely modeled, there is no reason to suspect that the earth's atmosphere is anything but a physically determined system. There is no purposeful action within the components of the system. Weather patterns therefore are chaotic and not predictable simply because of the enormity of the set of factors involved in the calculation.

In human society however, this unpredictability is of another type which is even more pronounced. It has been demonstrated through the writings of various Austrian scholars⁸⁰ that economic calculation under socialism is a theoretical impossibility not merely because of the enormity of information in an economy and the computational limitations, but because of the nature of economic information itself. One distinguishing characteristic of economic information is that it is subjective in nature. That is, the factors which determine the outcomes of the system are

⁷⁹ “Chaos Theory.” Encyclopedia of Management. Retrieved August 16, 2021 from Encyclopedia.com: <https://www.encyclopedia.com/management/encyclopedias-almanacs-transcripts-and-maps/chaos-theory>

⁸⁰ For example, see Huerta de Soto *Socialismo, cálculo económico, y función empresarial*.

not generalizable and deterministic, but the result of purposeful human action, free-choice, and relative subjective valuations⁸¹. There is a type of chaos which consists of conscious free-willed individuals which makes the unpredictability of a different nature entirely.

One of the defining characteristics of any chaotic system is the high dependence on initial conditions. In the chaotic system of the earth's atmosphere, a butterfly flapping its wings in Tokyo can provide the initial condition to cause a hurricane in Chicago. In conscious chaos, one purposeful human action can and does repeatedly change the course of history.

In any case, the study of unpredictability should play a large role in economic methodology as the systems under study, whether deterministic or free, carry a level of unpredictability. The eradicable uncertainty inherent in the study of economics makes the study of Chaos a relevant field of study⁸². This uncertainty inherent in societal systems is sufficient reason for discrediting the strict *a priori* method when epistemologically evaluating social institutions such as ethical systems.

4.2.2. Complexity Theory

Complexity theory, while having many similarities to chaos theory, asserts that chaos is not sufficient to explain spontaneous order. A complex system is characterized in part when the whole is not equal to the sum of the parts. While each individual component may have a distinct role in the system, the system itself has distinctive purposes to the sum of the aggregate of the individual

⁸¹ This distinction seems to rely on the existence of free will. Subjective simply information that exists in a particular mind, or is it a personal preference which requires a conscious, freely willed agent? One aficionado of Austrian economics believes the former. Vincent Wolters writes: "Chaotic systems are not random, but instead completely deterministic functions." If this is the case, then there shouldn't be any inherent impossibility of economic calculation under socialism, merely a technical one.

⁸² For an example of an application to political economic theory, see Murphy (2002).

components. In the science of human action and the extrapolation to social systems, this is especially important, for “we cannot comprehend the whole without seeing its parts, but we can see the parts without comprehending the whole.”⁸³ In economics, this means that we cannot comprehend the economy without seeing the individual human actor, but we can likewise fail by only looking at the individual without comprehending the societal system in which they are embedded.

If societal systems are complex in this sense, this holds epistemological implications as well. Since we must look at the whole in order to comprehend the parts, our model will necessarily be incomplete. This methodological synthesis, as opposed to analysis, thus requires us to take a birds eye view of the phenomenon in question. This process cannot be done in a vacuum. As one author put it, “economic complexity prevents us from eliminating literary methods from economic science.”⁸⁴ These literary methods, though less precise than pure logic, ends up being more accurate. Literary methods are fundamental and indispensable in normative research.

4.2.3. Emergence and spontaneous order

Perhaps one of the most critical and applicable components of general systems theory is the study of emergent properties and spontaneous order. It is this which characterizes the work of Hayek and his study of social phenomena and institutional evolution. As one example of research done on the connection between Hayekian philosophy and the complexity approach, I’d like to refer to a paper titled “complexity and the Austrians” written by Fabio Barbieri of Sao Paulo. He writes of Hayek that:

“We can discern a theme throughout his work that unifies his theoretical system, having at its center the concept of complexity. This theme is defined by the search for explanations for the emergence of coordinated actions by individuals, whose limited knowledge

⁸³ Polanyi (1959). p. 29.

⁸⁴ Koppl (2010).

precludes them from overcoming, by means of conscious control, the complexity of the problem of coordination.”⁸⁵

For Hayek, it is a spontaneous order which can describe the coming of the institutions of money, language, and certain social rules of conduct. A more rigorous development of these processes can be beneficial to the study of Austrian theory. For now, we'll just note the compatibility with the Hayekian approach and the paradigm of complexity and emergence.

4.2.4. Dynamic efficiency

An example of spontaneous order of a complex system is the dynamic efficiency which occurs through coordination within an economy. Given a certain set of initial conditions (which we will discuss in the next chapter), a sort of big bang produces the emergence of dynamic efficiency, which we recognize as thriving economies and flourishing civilization. This coordination effect does not occur naturally, as we observe in primitive cultures, rather it seems to only take place given a particular set of ethical principles that have been universally adopted.

Huerta de Soto wrote eloquently on the subject of dynamic efficiency in free market economies. According to Austrian theory as summarized by Huerta de Soto, the entrepreneur is the driving force of all coordination in the economy. “We may define entrepreneurship as the typically human ability to recognize opportunities for profit which appear in the environment and to act accordingly to take advantage of them.”⁸⁶ The efficiency of such complex stems is due to the adaptability of such an entrepreneurial function. This adaptability requires full control over his actions and his property, hence private property law.

Of course, it should be noted that the behavior of each individual actor can be either a coordinating force or a destructive force to efficiency of the system. That is, there can be those who act contrary

⁸⁵ Barbieri (2013).

⁸⁶ Huerta de Soto (2009). p. 8.

to the ethics required for dynamic efficiency. When the axiom of private property is violated, societies tend toward disorder rather than order. The initial conditions must be finely tuned in order for the dynamic efficiency to occur.

4.2.5. Efficiency and adaptability

Now, according to complexity theory, there is a tradeoff between efficiency and adaptability. When complexity is high, greater adaptability tends towards greater efficiency. That is to say, in a highly complex system such as an economy, the more adaptable the individual components can be (i.e. the human actors), the greater the efficiency of the system can be. In this case, efficiency is synonymous with freedom, and freedom is synonymous with property rights. With the most relevant combinations in bold, the schema plays out like this:

FIGURE 5

<i>Complexity</i>	<i>Adaptability</i>	<i>Efficiency</i>
High	High	high
Low	High	Low
High	Low	Low
Low	Low	High

For highly complex systems such as a market economy, the more freedom and adaptability each actor has, the greater the efficiency of the economy as a whole. For smaller, less complex systems, such as a family unit, firm rules and order are more desirable than anarchy.

The typical issue with central planning is that it is an attempt to have low complexity and high adaptability. One of many case studies is the Soviet Union. As concluded by one complexity science researcher:

"The Soviets thought they could have their cake and eat it, too: they originally believed that their economy would outperform capitalist ones because capitalist economies have so much waste related to multiple businesses competing to do the same thing. It would be far more efficient to coordinate all economic production. But in creating such large-scale economic structures, lower-scale complexity was sacrificed, resulting in a non-adaptive system [...] market systems allow for multi-scale evolutionary processes to naturally arise, resulting in innovations and complexity far beyond what anyone could have imagined, let alone designed."⁸⁷

Thus, dynamic efficiency and the necessary and sufficient ethical conditions which preclude it are not universal. The strict order which might be imposed on the level of an individual, family, or small team is not appropriate at higher levels of complexity. The dynamic efficiency of an economy and the restricted set of ethical principles which it relies on are not equal to the ethical principles of smaller scales.

4.3. Ethical epistemological complexity

As we saw in chapter 2, ethics cannot be determined by a simple set of static rules and their logical inferences. Ethics is state dependent, dynamic, complex, and emergent. This does not imply universal relativism;⁸⁸ however, ethics are relative on a localized scale. To some degree, right and wrong depends on the particulars of the situation. To make universal generalizations, such as the rule of self-ownership, to all levels of analysis, is incoherent with the whole of an ethical system. Self-ownership for example entails full responsibility, but children should not have the same responsibility as an adult.

The process by which we come to know ethical truths is much more complex, multifaceted, dynamic, situational, and nuanced than the axiomatic method allows. While it is false to apply the

⁸⁷ Siegenfeld, A. F., & Bar-Yam, Y. (2020).

⁸⁸ This is dependent on ontological theism. If God does not exist, then ethical values would be ultimately relative, only dependent on biological, social, or cultural factors.

positivist position that the only factor which should classify and determine a sound theory is its predictive power, it is equally false to take the extreme rationalist position that a theory can be considered sound despite blatant contradictions and absurd implications⁸⁹.

The way by which we come to conclusions on the truth value of our propositions is by means of a multifaceted mechanism comprised of various components: Social, cultural, traditional, communal, experiential, revelational. A sound belief in the truth value of existential propositions can only be reached after a long process which includes rational discourse, thought, and trial.

It can be said that the economy as a whole is a complex system. It is a system comprised of individual actors acting both in parallel and in opposition to one another. Economies produce emergent properties⁹⁰ which by the multitude of daily interactions. It is a synthesis, which employs literary methods, that gets us to better approximations of an accurate model of complex economic systems.

It can also be said that individual human action is a complex system itself. The values, preferences, traditions, mental actions, and micro behaviors are far more than can be understood through a simple analytic process. Rather, a synthesis is necessary to understand the individual human actor. It is one thing to know the facts about a person, but it is another thing entirely to know a person as a friend⁹¹. This is the reason that fiction, poetry, music, and visual arts all exist parallel to the exact sciences. A multilayered, multifaceted, and multidimensional perspective gives the opportunity to see the human system as a whole with more detail.

Given the difficulty of understanding complex systems, we employ methodological dualism. This technique has a purely theoretical super structure which interprets the vast amounts of data from history and real physical facts of reality. While this purely theoretical

⁸⁹ Such as, for example the conclusion that it should be legal for a parent to leave their baby to starve to death so long as it is on private property, as mentioned in chapter 2. While not a logical contradiction, this can be said to be an experiential absurdity.

⁹⁰ Though not formulated in this way, Leonard Reed's "I, Pencil" is a good illustration of economic emergence. Though there is no single actor capable of producing a simple pencil, the pencil exists. The pencil manufacturing process is greater than the sum of its parts.

⁹¹ In Spanish, it's the difference between "saber" and "conocer."

model cannot be empirically falsified, the correlation between empirical data and theory tells us something of the validity of our model. If a particular theory logically leads to experiential absurdities, as is the case in Rothbardian ethics, then we can safely assume that a modification to our model or methodology is appropriate.

4.4. *Triangulation of ethical objects*

We have seen from methodological dualism that, coupled with real world sense data, the *a priori* logical framework is appropriate and necessary for discerning certain aspects of human action. When ethics is the class of objects in question, we need to modify this approach. What we need is an approach to social theory and research that is distinct from the dominant empiricist and naturalist frameworks of mainstream social thought, and also distinct from the extreme rationalist position of the contemporary Austrian School. Supposing moral realism⁹², what we need now is an epistemological framework that will allow us to identify and describe these metaphysical ethical objects in terms of methodological dualism, with a theoretical framework that satisfies the conditions of actual experiential ethics.

In the empirical sciences, sense data can be misleading. For this reason, the positivist implores the whole of the scientific community to verify his results. Similarly, in the process of the discovery of ethical principles, we should not look to a singular person or body of people to dictate one particular conscience to the rest. This is hegemony, and history shows that the results are catastrophically horrific. At the same time, allowing social currents in general to dictate ethical norms can be equally devastating. What we need is a framework which is flexible enough to allow for the complexities and nuances of individual circumstance, while robust and sound so as to provide a structure of order and consistency.

One psycho sociologist researcher working out of Columbia University, Michel Alhadeff-Jones, has described perhaps a useful conception of the process of research that includes the paradigm of

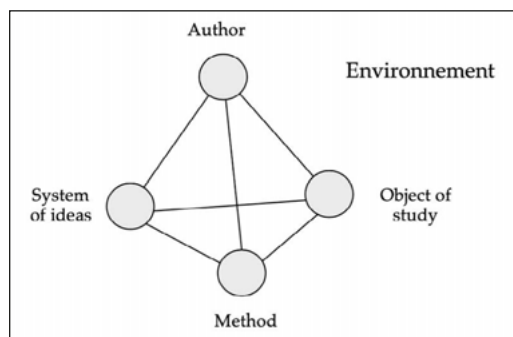
⁹² That is, supposing the existence of an objective moral reality: ethics which exist independently of human minds.

complexity and general system theory⁹³. While we disagree⁹⁴ with the universal constructivist and relativist interpretation of the research process, a useful result can be garnered from this approach and applied to the process of determination of guilt or innocence. Namely, the concept of “triangulation” can be applied to the process of determining truth or falsehood with respect to ethical judgements.

In the Alhadeff-Jones conception, there are three components working together within an environment. the *author* (researcher) employs a particular *method* (theoretical framework) and *system of ideas* (axioms) to examine the object of study. This whole process takes place within a particular cultural setting which, if the object of study is sufficiently complex, will also have an influence on the results of the study.

While rejecting the idea of the social constructivist ontology, it does seem to have some applicability as an epistemology for ethics. That is, acquiring knowledge of ethical objects as they actually are seems to depend on a social setting. Even as Rothbard illuminated in his Robinsonian analysis, ethics does not enter the picture until another actor enters the island. That is, without a social environment, one cannot establish social norms and customs.

FIGURE 6⁹⁵

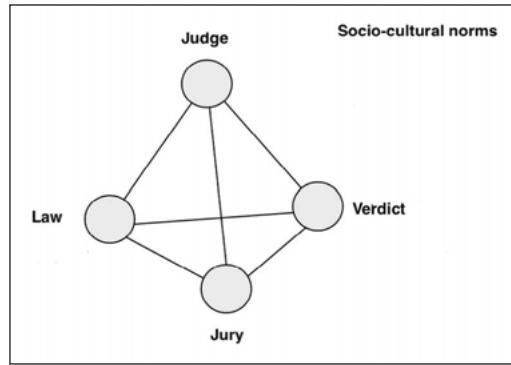


⁹³ Alhadeff-Jones (2013).

⁹⁴ For a critique of constructivism, see Óscar Cairrero's *Las políticas de la industrialización* pps. 90-92.

⁹⁵ Alhadeff-Jones, M. (2013).

FIGURE 7



This triangulation process is analogous to the process of discovering justice⁹⁶ which occurs in a courtroom. The abstract object of study corresponds to the just *verdict* of innocence or guilt, the *judge* being the author, the *jury* the method, and the *law* representing the system of ideas. While not one of these components alone is sufficient to determine the particulars of a case, the set comprises an imperfect system of checks and balances to better approximate whether some ethical principle has been violated.

As seen in the figure, this process of triangulation of the verdict can be an adequate method and has proven itself useful in modern civilizations.

4.5. Chapter conclusion

In this chapter, I've outlined the basic concepts of systems theory and its applications to social sciences. There are several important points which I tried to emphasize.

- Perceptions of ethical laws are distinct from the objective laws themselves. I have been focusing on is not the ontological

⁹⁶ While the court is not the ultimate determiner of justice, it is the best pragmatic system for discovering guilt or innocence.

origin of ethical values, rather presupposing their objective existence. Primarily, I considered a method by which we come to know them the epistemology.

- I've proposed that systems theory, the conceptions of chaos, spontaneous order, and emergence can help us to build models of conceptualizing the functionality of society and ethical systems. While proof of the type of mathematical certainty is impossible in the social sciences, knowledge is possible to the degree that we might apprehend through these abstractions. Systems theory and systems thinking can provide an epistemological tool to establish and codify normative laws.
- The process by which we apprehend and codify laws is multifaceted. While applying reason, rules of inference, sense data, and communal consensus (such as is done in a typical courtroom) we can come to ever better approximations of the truth.

These observations, while preliminary and tentative, have significant implications to the study of human action in general and the study of ethics in particular. While the axiomatic method is powerful for developing abstract theory to interpret historical data, a different method is required when the objects under consideration do not have a material component. Systems science offers a comprehensive, though incomplete, methodology for modeling and discovering ethical systems and normative laws.

5. Constitutionalism

As discussed in chapter 2, the incompleteness of logical systems has real implications to the real world including political systems. As a formal logical system relies on unprovable axioms and contains an infinite number of unprovable statements, and yet relies on the presupposed truth value of the axioms in order for consistency, so a society and the legal code thereof must rely on a set of unprovable premises and principles in order for a coherent society to function. The set of axioms that logical systems rest upon is analogous to the articles and amendments of a constitution.

5.1. *The origin of law*

The study of the origin of law has two components: the ontology and the epistemology. The ontological line of investigation is to ask, “by what mechanisms could a law exist?” It is to establish the existential possibility of such an object. The epistemological component is to ask, “how can we know it?” It is to establish the applicable tools to uncover it.

Those Austrian economists typically supportive of the anarcho-capitalist framework (arguing for a stateless society) typically do so from the position of natural law. Because man’s nature is that of a social creature, they argue, a society in which there are no positive constitutional laws will lead to the greatest human flourishing. What seems to be neglected in the literature though is the origin of this natural law and by what means could it be distinct from true natural or animal behaviors. Rothbard for example, though a firm believer in natural law, was quite vague on the question of its origin. While much of his theory is based on the philosophy of Thomas Aquinas, Rothbard made a deliberate attempt to distance himself from the ontological theism of his predecessor.

“In the controversy over man’s nature, and over the broader and more controversial concept of ‘natural law,’ both sides have repeatedly proclaimed that natural law and theology are inextricably intertwined. As a result, many champions of natural law, in scientific or philosophic circles, have gravely weakened their case by implying that rational, philosophical methods alone cannot establish such law: that theological faith is necessary to maintain the concept. [...] The believer in a rationally established natural law must, then, face the hostility of both camps: the one group sensing in this position an antagonism toward religion; and the other group suspecting that God and mysticism are being slipped in by the back door.”⁹⁷

So it was that the case to be made for self-ownership by Rothbard and Hoppe on a purely rationalistic basis. Particularly vague is the manner in which the word “established” is used. If the word is used

⁹⁷ Rothbard (1982). p. 3.

in the ontological sense, then the claim that logic itself can provide the foundation and source of phenomenon needs to be supported. If in the epistemological sense, then we would partially agree, though noting the necessary limitations of logic as discussed previously.

In any case, how can the concept of the ethics of human action distinct from nature be coherent in a nontheist framework? How can we talk about some "natural law" when the laws which we speak of are diametrically opposed to anything observed in nature? After all, it is nature which selects the strong from the weak and lets the sick die. It is nature which stalks their prey for the opportune moment to tear their flesh apart. Under the laws of nature, there is no such thing as private property, nor self-ownership. This is telling in the very title of Darwin's book *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. Under Darwinian natural selection, racial groups compete against one another in the struggle for dominance. Darwin explicitly states:

"Man selects only for his own good: Nature only for that of the being which she tends. Every selected character is fully exercised by her, as is implied by the fact of their selection."⁹⁸

This pure scientific rationalist perspective of nature of course has no room for virtue, only man's selfish pursuits in his struggle for survival. The necessary and sufficient initial conditions for human flourishing and dynamic efficiency cannot be derived from nature itself, for nature only looks to survive and self-serve, whereas human ethical norms of private property demand respect and service to attain a decrease in ones felt need.

If not nature, an inquisitive researcher then might ask, "what is the mechanism by which such laws can exist?" Thus far, the Austrian ethicists have not attempted to ground their philosophy. Bob Murphy summarizes the Austrian response to the ontological problem:

"some readers may wonder how I can propose a replacement for the State's "justice" system when I haven't first offered a rational

⁹⁸ Darwin (1859). p. 68.

theory of the source and nature of legitimate property rights. The answer is simple: I don't have such a theory."⁹⁹

Thus, without referring to an ultimate arbiter, there is no basis for establishing a supposed natural law. It must be taken on faith alone that private property is the ultimate given. This presents a significant problem for both anarcho-capitalists and constitution-alists alike. If there is no rational basis for supposing a natural law such as self-ownership, how can it be justified to regulate our neighbors without it being considered coercion? Using the example from chapter two, how could we save a starving child from the neighbor's house without being tried for breaking and entering?

It would seem that the theological origins of law are indispensable. This was undoubtedly recognized by the framers of the U.S. constitution who wrote:

"We hold these Truths to be self-evident, that all Men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the Pursuit of Happiness."¹⁰⁰

Or even more straightforward is the Swiss constitution:

"In the name of Almighty God!"¹⁰¹

"Law" does not exist in any meaningful sense without a lawgiver. The meta-ethical theological foundations¹⁰² of natural law are unavoidable. The ethicist would do well to consider these ontological problems as well.

5.2. *The nature of law*

According to Menger, "law" as such must be distinguished between two distinct brands: statute and law. There is a positive

⁹⁹ Murphy (2002).

¹⁰⁰ The Declaration of Independence of the United States of America.

¹⁰¹ Federal Constitution of the Swiss Confederation.

¹⁰² See William Lane Craig's work.

law, which exists by rule of State powers which we'll call statute, and there are organic processes which are rightfully called law. The organic process that he describes dates back millennia, and the specifics of its content are culturally dependent.

"The special contents that law assumes in a concrete case, before legislation begins to shape them, depend on the particular conditions of the population from whose mind law originated."¹⁰³

The second step in the formation of law is the codification. This can either happen as positive legislation, which holds no regard for the formation of the organic law, or it can happen as a codification of said organic law.

"These rules, however similar they appear on the surface to those of national law, are both by origin and by the guarantees of their realization essentially different from the law which grows out of the convictions of the population and the realization of which was also originally an affair of the nation. Indeed, they can be in direct contrast to national law; they are really statute, not law."¹⁰⁴

Statutes and laws have two fundamentally distinct natures. In Mengerian terminology, it is national law which arises from the collective conscience of societies, while statutes are imposed by hegemonic rule. It is often the case that the statutes imposed by State bodies do not reflect the evolution of the societal conscience. This, amongst free-market economists is usually said to be an abuse of power. In politics, there is a clear distinction between law and statute.

The question that remains is the relationship between civilized man and law. Does civilized lawful man exist without a governing body? In a Robinsonian analysis, there could be nothing illegal about cannibalism. Tribalistic stateless populations such as currently exist in the Amazon rainforest do not have law as we understand it. Therefore, Civilized man and the state institution develop simultaneously.

¹⁰³ Menger, C. (1871), p. 228.

¹⁰⁴ Menger, C. (1871), p. 229.

This is to say that the nature of law is not natural. If we are to accept moral realism, there must be a higher authority than man who has put the law in place. The organic nature of a law alone does not establish its legitimacy. It is therefore the case that there can be justification for this type of statute. Statute is not unjustified in itself; it must correspond with the ethical reality. The historically accepted national convictions are neither sufficient nor necessary for a law to be justified since the nature of the law in any case is not natural.

What should concern the policy maker is not what the populous says, nor what his conscience tells him, but objective fact of ethical principles. There can be no justice in a hegemonic dictatorship even if the origin of the imposed law is the collective conscience of the society. The nature of man is that of the animal, thus there can be no rules except survival unless the true nature of law is not natural.

5.3. *Ethics as a necessary and sufficient condition for dynamic efficiency*

Professor Huerta de Soto argues for ethics as a “necessary and sufficient condition for dynamic efficiency.” That is, without an ethical system, it is impossible to have a flourishing economy with an abundance of goods and services. Likewise, an economy which produces an abundance of goods and services must be an economy which respects absolute ethical principles, most notably that of private property and respect for individual sovereignty. He writes:

“The basic principle of social ethics, one which hinges on the private ownership of all that is created and discovered, and thus on the voluntary exchange of goods and services, is both the necessary and the sufficient condition for dynamic efficiency.”¹⁰⁵

Ethics is indeed a necessary and sufficient condition for dynamic efficiency. With only the following caveat: bounded rationality

¹⁰⁵ Huerta de Soto (2009). p. 21.

implies that the principle of self-ownership is only “true” on a particular scale, within a particular system. That is, it is only true in the pragmatic or legal sense of what ought to be in order to attain dynamic efficiency, prosperity, peace, and justice. The most we can say, formally speaking, of the necessary and sufficient condition of private property to dynamic efficiency is the logical bidirectional implication between the two.

5.4. *The initial conditions of a prosperous society*

In the context of chaos theory, given that human society is a complex system, i.e., highly dependent on initial conditions, we can look at the intentional formation of nations as the initial conditions for future developments of culture and society. Perhaps the most fundamental of those initial conditions in free societies with limited State powers are the premises supposed in the constitution. For this reason, the foundation of legal systems is essential and determines the outcome of a nation. Either it will lead to prosperity, freedom, and abundance, or it will lead to scarcity, serfdom, and poverty. The contents of the foundation of a legal system play an integral role in the development of the society as a whole.

In the same way that a butterfly flapping its wings in Tokyo can generate a hurricane in Chicago, so the foundations of societal institutions can generate either economic disorder or order. The original declarations of the State will have tremendous effects hundreds of years into the future.

5.5. *Axioms of the prosperous society*

All of this brings us to the final point to be made. The organizational structure of society is not entirely arbitrary or organic. We have talked about the bounded rationality, and the problems with applying the purely theoretical framework as a method of discovery (epistemology) for nonmaterial ethical principles. As it turns out, there are many interacting components which the human

mind integrates in order to discover such principles. The historic evolutionary traditional method is insufficient as demonstrated by the fact that law does not indicate just statute, nor does statute indicate justice. Nevertheless, there are pragmatic¹⁰⁶ principles of political law that can be implemented and sustained.

One of these pragmatics, limited in scope, and tentative principles is that of self-ownership. Another is that of the non-aggression principle. Thirdly is the rule of first appropriation.

- 1) Self-ownership
- 2) The non-aggression principle
- 3) Rule of first appropriation

For a sound defense of these principles, see the various great authors of Austrian economics and their predecessors. Let us keep in mind however the necessary limitations of these principles, the epistemological method to derive them, and the ontological basis to support them.

6. Conclusions

Gödel's theory implies that axioms are not formally demonstrable. A system if complete is inconsistent, and if consistent is incomplete. This applies not just to mathematics but the structure of knowledge and in some sense to the nature of reality itself. The normative conclusions which we use to build legal systems and societies are thus contained within a framework which is necessarily incomplete.

Menger dealt well with the distinction and relationship between the exact science of human action and its appropriate application of ethical principles. He wrote that:

¹⁰⁶ Only in a certain sense of the word. This is not to say that the conclusions arrived at through tradition or theoretical inquiry are not a reflection of reality, but that the conclusions, because of the limitations of proof and of bounded rationality, carry a sort of uncertainty.

"exact theories have in principle the task of making us understand theoretically *individual aspects of the real world*. Exact economics has the task of making us understand the *economic aspect* of national life. An "ethical orientation of exact economics" can thus by no means have the sense of aspiring to reveal to us at the same time the exact understanding of the ethical aspect of national life *and* of the economic aspect, that is, aspiring to unite the tasks of ethics and economics."¹⁰⁷

I, though a man of faith and an apriorist, recognize the limitations of the epistemological axiomatic method. As Menger articulated well in the citation above, some humility is in order with regard to determining social ethics. The principal conclusions taken from this investigation are the following.

1. Society is a complex system dependent on axiomatic initial conditions (natural law). It can be said that the pillars of society are those of justice and respect for private property. But, without the theological, ontological, and teleological foundations of such a system, it is in vain that we attempt to discover these initial conditions.
2. The Rothbardian-Hoppean attempt at axiomatic formalization is an extension of the failed Hilbert program. The attempt to show the principle of self-ownership by means of irrefutable proof is an extension of Hilbert's program to present a complete and consistent axiomatized system of mathematics. As Steven Hawking came to his senses with regards to the impossibility of the Theory of Everything, so the Austrian normative researchers ought to abandon the program of absolute completeness in political-science methodology and social theory.
3. Complexity theory fills the epistemological gap which incompleteness creates. Though the methods of exact economics are not applicable to normative problems, there are nevertheless ways of discovering such abstract yet objective objects.

¹⁰⁷ Menger (1871), p. 235.

4. Apriorist economic models are accurate but limited in scope (eg. self-ownership). We do not need to dispense with all the work done in the area of moral philosophy by the Austrian economists, but we do need to honestly reconsider and reexamine the scope and applicability of such doctrines. It is the responsibility of the praxeologist not just to be critical of the positivist methodology, but also to examine the nature and limitations of our own discipline.
5. There is no escaping Misesian pragmatism. For the purposes of attaining sound premises, it will often suffice to note that the alternative is unsatisfactory. If we want a better explanation of the foundations of our logical structure, we must deal with the foundational ontological questions of God, free-will, the theory of self-ownership, etc.
6. The constitutional initial conditions of a free society defined by “natural law” are necessarily *unnatural* in origin, and cannot be discovered strictly by means of logic. We have sketched an outline of what an ethically consistent rule of law might look like using literary methods and the framework of systems thinking. These “natural law” principles are the foundations of civil society. They must be objective, for if they were not then there would be no sense in arguing for our opinion of them. On the other hand, they are relative to the particulars of each circumstance.
7. Constitutional code can be considered axiomatic initial conditions sufficient for a prosperous society. It has been shown that the ethic of private property is necessary and sufficient for dynamic efficiency. The sociological big bang and expansion is dependent upon right first principles.

Mathematics and formal logic, though not reality itself, is the best tool that we know of for discovering objective reality. Gödel's theorem not only tells us something about logical systems, but about the structure of knowledge and the nature of proof and certainty. Gödel's theorem, though upsetting to those hoping for absolute and universal answers, ensures that a dynamic approach is the only applicable epistemological tool to move forward. Establishing the legal systems of private property which lead to dynamic efficiency

also require a firm ontological basis. Epistemological complexity and ontological theism form a solid framework for normative science methodology. The resulting constitutional principles chosen are the determinant initial conditions for a sociological big bang.

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