



Munich Personal RePEc Archive

**The complementary relationship between
institutional and complexity economics:
The example of deep mechanistic
explanations**

Gräbner, Claudius

17 December 2016

Online at <https://mpra.ub.uni-muenchen.de/77091/>
MPRA Paper No. 77091, posted 26 Feb 2017 16:29 UTC

The Complementary Relationship Between Institutional and Complexity Economics: The Example of Deep Mechanismic Explanations

Claudius Gräbner

claudius@claudius-graebner.com

Revised version, February 2017

Abstract

Analyzing economic systems from an evolutionary-institutional or a complexity perspective are two complementary approaches to economic inquiry. I discuss three arguments in favor of this hypothesis: (i) eminent institutional economists have considered the economy as what today could be considered a complex system; (ii) complexity economists lack meta-theoretical foundations which could be provided by institutionalist theory; and (iii) institutional economists could benefit from using methods of complexity economics. In this context, I argue that scholars considering the economy to be complex should seek to explain it by discovering social mechanisms instead of focusing on prediction. In order to distinguish between alternative explanations, scholars should refer to the deepness of an explanation, rather than to Occam's razor.

Keywords: agent-based computational economics, complexity economics, evolutionary-institutional economics, philosophy of science, systemism

JEL Classification Codes: B25, B41, B52

Economics is undergoing a crisis: the general public becomes more and more skeptical of economic experts, student movements criticizing the current state of teaching economics gain ever more attention, and even within the scientific community criticism on the current state of affairs is growing (Earle et al. 2016). One reason for the failure of economics is its unwillingness to consider its object of inquiry as a complex system. Many other (more successful) sciences, such as physics or biology, have accepted what could be called the *complexity challenge*. They have recognized that their subjects of inquiry are parts of complex systems, and even constitute complex systems themselves. They have reacted to this recognition with new theories and methods that ensure their continuing success. Large parts of economics have missed this development.

Of course, there are exceptions. A growing community of interdisciplinary scholars now tries to push the — admittedly very heterogeneous — research program of *complexity economics*. And even several decades earlier, some great thinkers already anticipated the complexity challenge in the social sciences. These scholars include a number of evolutionary institutionalists. For example, Thorstein Veblen and Gunnar Myrdal, undoubted pioneers of the institutionalist school, stressed the complexity of social systems, just without using the buzzword “complexity.” Therefore, the emergence of the research program of complexity economics should be good news for institutionalists. Yet, there are only few thematic and personal overlaps among the two research communities.

Much of this has to do with different personal and disciplinary backgrounds of the researchers, a lack of an explicit meta-theory on the side of complexity economics, and a very different set of methods. Here I argue that overcoming these obstacles would be fruitful. I illustrate the complementary relationship between institutionalist and complexity economics by focusing on one particular epistemological concept: *mechanismic explanations*.

To structure my argument, in the first section, I substantiate the claim that many eminent

institutionalists anticipated the complexity challenge and considered the economy as what would today be called a complex system. Thus, there is a very basic ontological affinity between institutionalists and complexity economists. In the second section, I focus on a particular concept, which invites closer collaboration between institutionalists and complexity economists. In order to make further progress in the understanding of complex economic systems, scientists must seek *mechanism-based* (or *mechanismic*) explanations. In sections three and four, I examine two challenges arising in the context of mechanismic explanations. The first challenge is that a meta-theoretical mean is required in order to discriminate among competing mechanismic explanations for the same observed phenomenon. Complexity economists can benefit from the concept of *deep explanation* that comes from the philosophical framework of systemism, underlying much of institutionalist theory (section three). The second challenge is that conjecturing mechanisms that operate in the real world and studying them empirically requires particular methods. Institutionalists can benefit from the toolbox of complexity economists to overcome this challenge (section four). I close this essay with some remarks on the concept of a “mechanism” (section five) and a short summary (section six).

The Complexity Challenge and Its Anticipation by Eminent Institutionalists

What are the essential properties of complex systems? First, note that the concept of a *system* is to be understood broadly: every entity is considered either a system or part of one (Bunge 2004). Together with the concept of a *mechanism* (which I discuss below), systems are the constitutional ingredients to the philosophical framework of *systemism* underlying much of institutionalist theory (Gräbner and Kapeller 2015). Roughly speaking, the essential properties of *complex* social systems are: (i) they consist of many different parts that are potentially heterogeneous and adaptive; (ii) they include a non-trivial set of relations among the parts that represent their direct interdependence; and (iii) they

have a layered ontology, i.e., there exist *emergent properties* that may feed back to the elements on lower ontological levels. These characteristics usually *imply* properties like the existence of non-ergodicity (or path-dependence) and disequilibrium. While the concept of complexity has not been mentioned by eminent institutionalists (at least in its contemporary meaning), they have developed a very similar conception of the economic system.

For example, Thorstein Veblen – one of the founding fathers of evolutionary institutionalism – combined a psychologically and anthropologically rich conception of individual agency with a reflected view on the emerging meso- and macro-aspects of the economy, in particular its institutions and their effect on individuals. Thus, he mastered the layered ontology with the corresponding upward and downward effects central to systemist thinking and social complexity (c.f. Gräbner and Kapeller 2017). Gunnar Myrdal – another great institutionalist thinker – further developed Veblen’s concept of *cumulative causation* and stressed positive feedback loops within the economy. His notion of *circular cumulative causation* verbally expressed the ideas of path-dependency and non-ergodicity of economic systems, which are central in the complexity approach today.¹ There is, therefore, a basic ontological affinity between institutionalism and complexity economics that indicates potential gains of cross-fertilization among the two paradigms. In the next section, I focus on one meta-theoretical implication of socio-economic complexity to illustrate this point: the need to adopt a way of explanation that gives credit to the complexity of the real world.

Epistemological Implications of the Complexity Challenge: The Need for Mechanism-Based Explanations

Every model has a purpose, and this purpose affects its design, presentation, and quality assessment (Mäki 2009). In conventional economic theory, universal predictive power is often said to be an important quality indicator for models.² In the context of complex systems, this quality

indicator, however, is inadequate because complex systems are often non-ergodic and show chaotic dynamics. This often renders point-prediction (particularly in the long run) impossible and makes it a poor indicator for the quality of the model.

The default option instead should be a focus on identifying the *mechanisms* (or “pathways”) that have caused the status quo. In other words, one needs to seek mechanism-based or *mechanismic* explanations (c.f. Bunge 2004). Mechanismic explanations go beyond a purely descriptive analysis that provides a very detailed exposition of the particular events leading from one situation to another. Instead of being focused on particular case studies, mechanism-based explanations are theories of medium-range. That is, mechanisms do not constitute universal laws, but have a certain generality (Hedström and Swedberg 2005).

There are many reasons why scientists, who study complex economic systems in general, and institutionalists and complexity economists in particular, should focus on mechanism-based explanations. I focus on three reasons. First, mechanismic explanations are the natural mode of explanation if one is working within a systemist framework. As I indicated above, systemism is ontologically built on the twin concept of systems and mechanisms. Every system is a potential carrier for mechanisms. Studying mechanisms thus helps us to understand something very fundamental about the object of inquiry. It is, therefore, a scientifically very attractive endeavor.

Second, studying mechanisms helps to generalize results obtained in one point of time and space into another without making the positivist mistake of chasing universal economic laws. As all systems are carriers of particular mechanisms and some mechanisms operate in more than one system, identifying a set of mechanisms in one system helps to understand other systems. For example, mechanisms that are causing persistent poverty in Mexico may also operate in Panama. Consequently, studying mechanisms goes beyond examining certain case studies. However, since there is no *a priori* reason that mechanisms operate similarly in isolation and in conjunction with

other mechanisms (Page 2012), this constitutes only an (important) first step. Mechanisms may interfere with each other and interaction effects among them may play an important role. Taking a complexity approach to the search for mechanisms naturally lets one acknowledge the dependence of mechanisms on their socio-cultural environment, and motivates the development of a toolbox of mechanisms which serves as a vantage point for the study of every new situation.

Third, understanding and identifying mechanisms is essential for policy design. Without knowledge of the respective mechanisms, it is impossible to know, for example, whether a poverty reduction program that has been very successful in Mexico will also work in Panama. Because the set of mechanisms (and the socio-economic environment) in Panama differs from that in Mexico, the same program may have different effects in these countries. Only if one focuses on the mechanisms underlying the success of the program in Mexico, one could find out whether these mechanisms will have a similar effect in Panama (Deaton 2010; Grüne-Yannoff 2016).

It is striking that — beyond having anticipated the complexity challenge itself — eminent institutionalists have also practiced (implicitly or explicitly) the search for mechanistic explanations. Myrdal, for example, identified several fairly general mechanisms, such as backwash and spread effects (Myrdal 1973), or circular cumulative causation (Berger and Elsner 2007; Myrdal 1944). Veblen ([1899] 2009) started theorizing about the instrumental-ceremonial dichotomy of institutions, and institutionalists continued to study the corresponding mechanisms of institutional change (Bush 1987; Elsner 2005). All these mechanisms are (essentially or accidentally) associated with very different economic systems.

There are two challenges that are associated with the search for mechanistic explanations: a theoretical and a methodological one. The theoretical challenge concerns the way one discriminates between competing mechanism-based explanations. The methodological challenge concerns the problem of actually identifying potential mechanisms operating in the real world. The theoretical

challenge can be addressed by using the meta-theoretical concept of *deep explanation*, which can be derived from the kind of systemism underlying much of institutionalism (Gräbner and Kapeller 2015). Here, complexity economists can benefit from the sound philosophical foundation of institutionalism. The methodological challenge can be addressed by using methods from complexity economics. Here, institutionalists can benefit from the rich set of methods available in complexity economics. Thus, the way the two challenges can be addressed illustrates the complementary relationship between institutionalism and complexity economics.

The Concept of Deep Explanations

Let me first consider the theoretical challenge. Within an instrumentalist approach³ of theorizing, the dubious concept of Occam's razor is usually put forward as the standard measure to distinguish between similar explanations. According to the razor, if two theories explain the same phenomenon equally well, the simpler one is to be preferred. But there are two fundamental problems with Occam's razor. First, it is very difficult to measure the simplicity of a particular explanation (see already Bunge 1961). Second, it is by far not clear when two theories explain the same phenomena equally well.⁴ These challenges can be overcome if one replaces Occam's razor with the concept of *deep explanation*. According to this concept, not simpler theories should be preferred, but deeper theories. One theory is deeper than another if it explains observed phenomena with recourse to more of the underlying mechanisms. Consider the following example: Why does a rise in real per-capita income lead to an increase in per-capita consumption expenditure? This is a central question if one wishes to understand the sustainability of growth rates. A conventional approach would use utility-maximizing agents, whose preferences feature the property of local non-satiation and value some goods more than others. In the context of increasing real income agents will substitute inferior for superior goods, and in the equilibrium the economy continues to grow. A more complicated, but

much more convincing approach would be to consider the needs and wants of humans as they have evolved over time.

Ulrich Witt (2010) explains that needs and wants can be either physiologically determined, hence homeostatic (e.g., for the need of collecting food and securing shelter), or they can be non-physiological and non-homeostatic (e.g., for the want of group conformity or status-seeking). Because of limited cognitive resources, human beings have the ability of social cognitive learning that, in turn, allows commodities to have characteristics which are symbolic and socially constructed. Some symbolic properties are capable of serving the individual need for social status. As a consequence, the demand for these (often rather expensive) goods rises. This explanation is certainly much more convincing than the standard approach which simply assumes preferences and the capacity to maximize one's utility, rather than identify the mechanisms underlying these preferences. While Occam's razor is unable to seriously distinguish the two explanations, the concept of *deep explanation* rightfully favors the evolutionary concept offered by Witt (2010).⁵

The concept thus provides a natural motivation to dig deeper into problems and to constantly question prevalent explanations. It also challenges misleading assumptions that are made for convenience only, such as, for example, the maximization hypothesis or strong rationality assumptions common in economics. Researchers, who strive for a deep explanation, are motivated to question such assumptions and to explore their underlying empirical plausibility — as well as to search for alternatives if such empirical plausibility cannot be found (for a related argument in the context of theories of institutional change, see Elsner 2012).

Note that the kind of meta-theoretical concepts I discuss so far structure scientific inquiry and facilitate the mutual references among different studies. Complexity economics currently lacks such concepts because it has no adequate (meta-)theoretical foundations. Therefore, complexity economists could benefit tremendously from considering institutionalist theory.

Identifying and Communicating Mechanisms: Computational Models

The second challenge with respect to mechanism-based explanations concerns the adequate method of identifying social mechanisms. Since mechanisms are not directly observable, they need to be conjectured (Bunge 2014, 186). Conjecturing mechanisms, however, is a tough problem. In this context, institutionalists can benefit from using methods of complexity economics that facilitate the conjecturing of mechanisms. Of particular interest (although certainly not the only useful method) in this context are agent-based models, which allow a very direct representation of the layered ontology and its upward and downward effects (for a more complete discussion, see Gräbner 2016). The most important feature of computational models is their ability to encode hypothetical mechanisms in an analytically very exact way. By comparing the behavior of the model with what we know about reality, and by gradually refining the model, one can have a very clear, structured, and effective way to conjecture mechanisms and to provide ever deeper explanations.⁶ In the best case, they are then combined with graphical methods from statistics to validate the conjectured mechanism with the data available (see, e.g., Moneta and Russo 2014).⁷ I have already discussed the usefulness of computational models for institutionalist research in a previous work (Gräbner 2016) and I will keep the argument short. But I want to emphasize one particular advantage of computational models: They are usually written in algorithms rather than equations. Algorithms are more similar to our natural language and are very flexible formalization devices. Therefore, they are useful in formalizing very different approaches that help to understand a particular system and to compare them. These algorithms can serve as a language that is bridging different schools of thought, thereby supporting a productive pluralism within economics.

Some Remarks on the Concept of “Mechanisms”

The concept of social mechanisms is potentially ambiguous. Tyler Cowen (2005), for example,

argues that neoclassical economics is very successful in providing mechanistic explanations by showing how the market mechanism brings about a certain result. But it is very misleading to characterize the market as one particular mechanism (see already von Mises 1949). Institutionalists have long argued that markets are embedded in institutions and can function in very different ways (i.e., can represent very different mechanisms).⁸

To avoid ambiguity, it seems plausible to define a mechanism as a “process (or sequence of states, or pathway) in a concrete system” (Bunge 2004, 186). This definition not only stresses the relationship, but also the distinctiveness of systems and mechanisms. While a system represents a *being*, a mechanism represents a *change* in that being (c.f. Bunge 2004). For an extensive discussion of definitions of a “mechanism” see e.g. Gerring (2007).

Conclusion

In this article, I tried to illustrate the complementary relationship between evolutionary-institutional and complexity economics using the example of deep mechanistic explanations. I further showed that eminent institutionalists have anticipated this “complexity challenge” and that — despite a lack of current collaboration — there exists a fundamental ontological affinity between complexity and institutionalist economists. On that basis, both research communities have much to offer to each other. Complexity scholars could benefit tremendously from institutionalist (meta-)theory. The lack of such theory prevents complexity economics from being an even more productive and successful paradigm. I illustrated this via the example of mechanistic explanations, which is a mode of explanation that is particularly well suited for complex social systems, and should be the default mode of explanation for institutionalists and complexity economists. I also presented the concept of *deep explanation* as an attractive alternative to Occam’s razor. Such meta-theoretical tools are currently missing in complexity economics. On the other hand, institutionalist economists

can benefit from the set of sophisticated methods of complexity scholars. In particular, computational models can be helpful in conjecturing mechanisms, relating different explanations to each other, and assessing the empirical validity of a theory. Thus, the positive relationship between institutionalist and complexity economics is mutual, and closer collaboration would be for the good of both scientific communities.

Endnotes

¹ Mario Bunge (1999, 2012) provides a more extensive list of institutionalist economists who (implicitly) have worked in a systemist way.

² This might sound surprising given the poor predictive performance of many mainstream models. This lack of predictive capacity is usually “explained” by the violation of particular *ceteris paribus* assumptions.

³ “Instrumentalism” here refers to the particular positivist epistemology. It does not refer to the institutionalist approach to theorizing and policy-making, as outlined in F. Gregory Hayden (2006, ch.3).

⁴ This is particularly the case if two explanations come from different, potentially incommensurable paradigms (Kuhn 1962). As economics should currently be considered a multi-paradigmatic science (see Elsner 1986), this is a probable incidence.

⁵ Since both models essentially give the same predictions on sustainable growth rates, the standard model is certainly simpler than the one offered by Witt. Defenders of Occam’s razor could then argue that Witt’s theory explains the observed facts *better* than the standard theory, and thus should be preferred. But in this they would lack a concept explaining what they mean with “better.”

⁶ This process should be embedded into an adequate epistemological framework to clarify how the explanatory power of the model increases. I have previously suggested such a framework (Gräbner 2017), but there are other useful alternatives. The most important thing is that the epistemological framework is made explicit in the modeling exercise.

⁷ Alessio Moneta and Federica Russo (2014) discuss the concept of *evidential pluralism* that specifies the circumstances under which one can make informed statements about causal mechanisms in reality. They argue that both background knowledge on the mechanisms at work and

statistical evidence is needed. Computational models are useful in supplying the mechanistic information in a form that can then be tested statistically.

⁸ Geoffrey M. Hodgson (2015, 139) makes a good proposal by defining a market as an organized and institutionalized recurrent exchange.

References

- Berger, Sebastian and Wolfram Elsner. “European Contributions to Evolutionary Institutional Economics: The Cases of ‘Cumulative Circular Causation’ (CCC) and ‘Open Systems Approach’ (OSA).” *Journal of Economic Issues* 41, 2 (2007): 1-43.
- Bunge, Mario. “The Weight of Simplicity in the Construction and Assaying of Scientific Theories.” *Philosophy of Science* 28, 2 (1961): 120-149.
- . *Social Science under Debate*. Toronto, Canada: University of Toronto Press, 1999.
- . “How Does It Work: The Search for Explanatory Mechanisms.” *Philosophy of the Social Sciences* 34, 2 (2004): 182-210.
- . *Evaluating Philosophies*. Dordrecht, Netherlands: Springer, 2012.
- Bush, Paul D. “The Theory of Institutional Change.” *Journal of Economic Issues* 21, 3 (1987): 1075-1116.
- Cowen, Tyler. “Do Economists Use Social Mechanisms to Explain?” In *Social Mechanisms. An Analytical Approach to Social Theory*, edited by Peter Hedström and Richard Swedberg, pp. 125-146. Cambridge, UK: Cambridge University Press, 2005.
- Deaton, Angus. “Instruments, Randomization, and Learning about Development.” *Journal of Economic Literature* 48, 2 (2010): 424-455.
- Earle, Joe, Moran, Cahal and Zach Ward-Perkins. *The Econocracy. The perils of leaving economics to the experts*. Manchester, UK: Manchester University Press, 2016.
- Elsner, Wolfram. *Ökonomische Institutionenanalyse — Paradigmatische Entwicklung der ökonomischen Theorie und der Sinn eines Rückgriffs auf die ökonomische Klassik am Beispiel der Institutionenanalyse (“Property Rights”)*. Berlin, Germany: Dunker & Humblot, 1986.
- Elsner, Wolfram. “The Theory of Institutional Change Revisited: The Institutional Dichotomy, Its

- Dynamic, and Its Policy Implications in a More Formal Analysis.” *Journal of Economic Issues* 46, 1 (2012): 1-43.
- Gerring, John. “The Mechanismic Worldview: Thinking Inside the Box” *British Journal of Political Science* 38, 1 (2007): 161-179.
- Gräbner, Claudius. “Agent-Based Computational Models — A Formal Heuristic for Institutional Pattern Modelling?” *Journal of Institutional Economics* 12, 1 (2016): 241-261.
- . “Dealing Adequately with the Political Element in Formal Modeling.” In *A Cyprus Symposium: Theory and Method of Evolutionary Political Economy*, edited by Hardy Hanappi, Savvas Katsikides and Manuel Scholz-Wäckerle. London, UK: Routledge, 2017.
- Gräbner, Claudius and Jakob Kapeller. “New Perspectives on Institutional Pattern Modeling: Systemism, Complexity, and Agent-Based Modeling.” *Journal of Economic Issues* 49, 2 (2015): 433-440.
- . “The Micro-Macro link in Heterodox Economics.” In *The Handbook of Heterodox Economics*, edited by Lynne Chester, Carlo D’Ipolity and Tae-Hee Jo. London, UK: Routledge, 2017 (forthcoming).
- Grüne-Yanoff, Till. “Why Behavioral Policy Needs Mechanistic Evidence.” *Economics & Philosophy* 32, 3 (2016): 463-483.
- Hayden, F. Gregory. *Policymaking for a good society*. Ney York, NY: Springer, 2006.
- Hedström, Peter and Richard Swedberg. “Social Mechanisms: An Introductory Essay.” In *Social Mechanisms. In An Analytical Approach to Social Theory*, edited by Peter Hedström and Richard Swedberg, pp. 1-31. Cambridge, UK: Cambridge University Press, 2005.
- Hodgson, Geoffrey M. *Economics in the Shadows of Darwin and Marx*. Cheltenham, UK: Edward Elgar, 2006.
- . *Conceptualizing Capitalism: Institutions, Evolution, Future*. Chicago, IL: University of Chicago

- Press, 2015.
- Kuhn, Thomas. *The Structure of Scientific Revolutions*. Chicago, IL: University of Chicago Press, 1962.
- Mäki, Uskali “Models and Truth: The Functional Decomposition Approach.” In *EPSA Epistemology and Methodology of Science: Launch of the European Philosophy of Science Association*, edited by Mauricio Suarez, Mauro Dorato and Miklós Redei, pp. 177-187. Dordrecht, Netherlands: Springer, 2009.
- Von Mises, Ludwig. *Human Action: A Treatise on Economics*. London, UK: William Hodge, 1949.
- Moneta, Alessio and Federica Russo. “Causal Models and Evidential Pluralism in Econometrics.” *Journal of Economic Methodology* 21, 1 (2014): 54-76.
- Myrdal, Gunnar. *An American Dilemma: The Negro Problem and Modern Democracy*. New York, NY: Harper & Brothers, 1944.
- . “Equity and Growth.” *World Development* 1, 11 (1973): 43-47.
- Page, Scott E. “Aggregation in Agent-Based Models of Economies” *Knowledge Engineering Review* 27, 2 (2012): 151-162.
- Veblen, Thorstein. *The Theory of the Leisure Class*. Oxford, UK: Oxford University Press, [1899] 2009.
- Witt, Ulrich. “Symbolic Consumption and the Social Construction of Product Characteristics.” *Structural Change and Economic Dynamics* 21 (2010): 17-25.