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Substantive Economics and Avoiding False Dichotomies  
in Advancing Social Ecological Economics

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# Substantive Economics and Avoiding False Dichotomies in Advancing Social Ecological

Economics

by

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## **Abstract**

The proposal has been put forward that ecological economics seek to become substantive economics (Gerber and Scheidel 2018). This raises important issues about the content and direction of ecological economics. The division of economics into either substantive or formal derives from the work of Karl Polanyi. In developing his ideas Polanyi employed a definition from Menger and combined this with Tönnies theory of historical evolution. In this paper I explore why the resulting substantive vs. formal dichotomy is problematic. In particular the article exposes the way in which trying to impose this dichotomy on history of economic thought and epistemology leads to further false dichotomies. Besides Polanyi, the positions of other important thinkers informing social ecological economics (SEE) are discussed including Neurath, Kapp and Georgescu-Roegen. The aim is to clarify the future direction of ecological economics and the role, in that future, of ideas raised under the topic of substantive economics.

## **Keywords**

Substantive economics; Karl Polanyi; Formal economics; History of thought; Epistemology; Social ecological economics; Economic anthropology

## 1. Introduction

In their article “*In Search of Substantive Economics*” Gerber and Scheidel (2018) have made an important contribution to the debate over how ecological economics should construct a coherent and integrated theoretical understanding.<sup>1</sup> Their clear concern for a divorce from neoclassical economics and ‘free’ market apologists is evident. Support for their position comes from social ecological economics (SEE) and its logic of defining ecological economics as a heterodox field of research (Spash, 2012a, 2013). Consistent with this, the authors bring together a range of relevant thinkers (e.g., Kapp, Polanyi, Neurath, Marx) who provide important insights into the problems with capitalism and the potential for transformative alternatives. In this respect they helpfully open the door to a wider discussion as to the content and direction of ecological economics.

Along these lines a bold proposal by Gerber and Scheidel (2018) is that three research agendas be pursued, namely social metabolism, political institutional structure and needs. While perhaps the authors feel their proposal is self-evident it is rather lacking in theoretical support. The claim to having established “the three pillars of substantive economics” is also open to debate (e.g. why three?; on what theoretical basis do they rest?; as pillars are they unrelated?; what exactly do they support?). However, I do not wish to take issue with the three agendas. Neither is my concern with the central part of their paper that addresses one of these agendas, social metabolism. What I would like to explore is the headline claim that we, ecological economists, should be seeking a substantive economics. I will take issue with the basis on which they argue for defining ecological economics in terms of substantive economics, and with their doing so by appealing to a set of strongly drawn dichotomies. The principle amongst those dichotomies being the definition of economics as either ‘substantive’ or ‘formal’.

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<sup>1</sup> Relevant text from Gerber and Scheidel (2018) is included as Appendix I.

The distinction between these ‘two meanings of economics’ (to borrow from Polanyi, 1977c) is summarised in their Table 1 (Gerber and Scheidel, 2018: 189), see also Appendix II of this paper, which consists of two opposing columns. The key contrasting points of substantive vs formal economics are given as being: in kind vs money; in substance vs form; need vs price based; use vs exchange value; value incommensurability and weak comparability (biophysical and socioeconomic indicators, multi-criteria analysis) vs monetary commensurability (monetary indicators and cost-benefit analysis); social metabolism vs. marginalism; planning vs. market. Substantive economics is designated to be concrete and field-driven, and they link this to regarding the economy as an historical construct embedded in society and the environment. In contrast, formal economics is specified as being abstract and model-driven, and they link this to regarding the economy as being a deduced structure based on a set of axioms, e.g., *homo economicus* (Gerber and Scheidel, 2018: 189). I will contend that these sets of claims confuse economics and the economy. For example, the economy is not a deduction, deduction is what some economists do to make inferences, while whether an economy is embedded is a question about real structure in the world.

That is, the way in which the argument is made mixes-up what an economy is in reality (ontology) with what economics needs to do to create knowledge (epistemology). Gerber and Scheidel (2018: 186) argue that the history of the substantive vs. formal dichotomy in economic thought extends “from Aristotle to the founding fathers of modern ecological economics”. This claim is problematic because it is made by assuming the formal definition has always been relevant to actual economies, something which would defy understanding the origins of modern market capitalism. In the attempt to create an overarching support for their claims, they also mix in epistemological concerns that have little or nothing to do with whether any actual economies have substantive or formal qualities, or whether a researcher

decides to accept the definition of what is economic as substantive or formal or both. They proceed to erroneously classify approaches in epistemology as being either substantive or formal and fail to notice how this results in a conflict with the designation of specific people (e.g., Neurath, Polanyi, Georgescu-Roegen) as being in their substantive economics camp. In the following I aim to outline each of these points. My overall concern here is to clarify how ecological economics should proceed as a social science and go beyond past dichotomous thinking.

## **2. Economics vs. Economies**

At the outset a distinction needs to be made between economics as a discipline (a field of social science research) and the economy as a social reality. The latter is the object of study and its form through history and how it changes is a major topic of research. Historical analysis of the economy also means going beyond using theories that are relevant for actual systems in existence today. This is even more important for ecological economists committed to SEE, because their concern is for the social ecological transformation of the current system to a more socially just and ecologically harmonious system.

What economists of various sorts do in their practice is a different matter. Lack of realism has been a criticism of certain camps within ecological economics itself, especially because of the adoption of mainstream approaches (Spash, 2011, 2012b, 2013). Economics as a social practice may have absolutely nothing to do with understanding the actual economy or historical economies. This is indeed the major contention of many heterodox economists with respect to mainstream macroeconomics and neoclassical economics. Distinguishing economics as a discipline from the actual economy is important exactly because what is termed economic by the mainstream has been reified as the actual economy in almost total disregard of reality.

This problem has been recognised for some time and was termed the ‘economistic fallacy’ by Polanyi (1977b). In part of his research he explored economies throughout human history (Dalton, 1971; Polanyi et al., 1957). What his economistic fallacy showed was how not just economists but also anthropologists, historians and sociologists adopted a basically neoclassical economic price-making market theory and applied this to every human society that ever existed. Due to the rise of neoliberalism the ‘economistic fallacy’ has become even more prevalent today. All human choices are deemed to be within the remit of economics, because they are defined as individual cost-benefit decisions that can be made most efficiently by placing them within a price-making market (e.g., the work of Becker equating life and death decision to buying a cup of coffee, as made most explicit in his suicide economics). Polanyi was concerned to expose the erroneous imposition of a specific, market based, economic logic on all social reality.

What should be clear then is that a practice in economics should not be confused with operations of an actual economy. In this respect the question posed by Gerber and Scheidel (2018: 187) of “whether the study of the economy should be substantive or formal” is incorrect, and so is their claim that this has been a fundamental question running throughout economic and social political thought since the ancient Greeks. The question is not some dichotomous choice between *a priori* approaches in economics, but rather what approach enables the best understanding of our object of study, namely a specific spatial and temporal economy. Their second claim is also incorrect because ‘formal economics’, as defined in their Table 1 (see Appendix II), has only existed since the rise of theorising about price-making markets. More specifically, the marginalist revolution of the late 1800s became, what Veblen termed in 1900, neoclassical economics; a term that did not take-off until the 1950s (Aspromourgos, 1986). Before the rise of price-making market capitalism there was no such

set of points that could have been deemed relevant to understanding the general operation of an actual economy. This, in fact, was the contention of Polanyi and his colleagues in their historical analyses of past societies (see Polanyi et al., 1957). However, Polanyi too easily removes the attributes of capitalism and focussed solely on markets and often fails to qualify his discussion with “price-making”, just as he fails to qualify exchange with market. Elements of price-making markets may appear and disappear and this was why Polanyi (1957b) could write that Aristotle discovered ‘the economy’, meaning he had noted such an occurrence of this type of market institution. However, we should not confuse the occurrence of such markets with capitalism, which is only a few hundred years in existence and has a distinct social and economic form of its own (see Wood, 2003).

### **3. Economies as Objects of Study**

The point then is to clarify what is important about economies that makes a substantive theory more insightful than a formalist theory? Does one provide a better understanding than the other? The relevance of and debate over substantive versus formal economics was mainly due to the work of Polanyi (1957a, 1977a), which impacted on economic history, anthropology, archaeology and sociology. In this respect, his historical work needs to be separated from his ideas about the currently existing capitalist economy.

Here there is a misleading classification in Gerber and Scheidel (2018: 143). Polanyi is placed firmly in the substantivist camp as if he opposed formalist economics.

“the formalists emphasized the universal claims of neoclassical economics while the substantivists, like Polanyi, gave priority to the empirical content of material circumstances and disputed that this diversity could be adequately grasped through just one set of concepts” (Gerber and Scheidel, 2018: 143)



In a literal sense this statement is correct, but what is left out is that Polanyi accepted the validity of neoclassical economics for understanding the current economic system. That is, he thought formal economics was valid for the object of study called a price-making market economy. This is why he was so positive and enthusiastic about Menger's discovery of the marginalist theory,<sup>2</sup> as evident in the quote of Polanyi by Gerber and Scheidel (2018: 144), regarding it as being a brilliant and formidable achievement in price theory. Polanyi was not against neoclassical economics and accepted the formal definition, because he believed it was highly relevant as an explanation of real price-making market economies, and he made this very clear.

“Neo-classical economics was established on Carl Menger's premise that its appropriate concern was the allocation of insufficient means to provide for man's livelihood. This was the first statement of the postulate of scarcity, or maximization. As a succinct formulation of the logic of rational action with reference to the economy, it ranks high among the achievements of the human mind. Its importance was enhanced by a superb relevance to the actual operation of market institutions which, due to their maximizing effects in day-to-day operations, were by their nature amenable to such an approach.”

(Polanyi, 1971: 17-18)

His criticism was not that formal economics was wrong, but rather that the “self-regulating market” economy it described would create social harm that was unacceptable and needed to be controlled (Gemici, 2015). He used the theory of a self-regulating market without question in his major thesis *The Great Transformation* (Polanyi, 1944), because it was the consequences, not the internal operation, on which he focussed. The downside of this is a

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<sup>2</sup> Polanyi credits Menger solely with this discovery. However, Menger's 1871 *Grundsätze der Volkswirtschaftslehre* included theories on marginal analysis, the same year that Jevons published them in his *Theory of Political Economy*. Léon Walras also published marginalist theories in his *Elements d'économie Politique Pure* in 1874. Together these three are generally taken as forming the roots of the marginal revolution that led to neoclassical economics.

failure to think critically about neoclassical economics, contradictions in his writing as to the role of economies in relation to society and a lack of theorising as to the social construction of price-making markets and capitalism (see Gemici, 2015). Yet, from Polanyi's work much can be built, but not by adopting his blind spots, which include the substantive vs formal dichotomy.

The categorisation of Polanyi as a substantivist along with Neurath and Kapp is also problematic. In terms of what a future economy might be like Polanyi was not in the substantivist camp. His own specific theory was one of market (Guild) socialism; that is he accepted a central role for price-making markets. This position is made clear in his engagement during the 1920s in the socialist calculation debate against the Austrian economist von Mises (for more on the debate see Adaman and Devine, 1996). Polanyi's main contribution on the topic has not been translated into English, but is discussed by Gemici (2015) and Dale (2010 Chapter 1). Gemici (2015: 140) notes that Polanyi's approach has similarities to the market socialist model of Oskar Lange (1936, 1937). Lange employed formalist neoclassical market models but with prices set by government administration. Polanyi believed a command economy without markets would not work. He argued for an economic system that mixed market types with production sectors having fixed prices set by administration (e.g., for raw materials, wages and intermediate goods) while final goods sectors would have flexible prices negotiated by market actors (e.g., for consumer goods and end products). Market socialism, of various forms, was a popular alternative in the 1920s and 1930s.

In contrast, Neurath, Polanyi's contemporary, did not opt for market socialism (Uebel, 2004: 51-52), but favoured a centrally planned economy along war time footings (Neurath, 2004 [1910]). This is the economy in-kind mentioned by Gerber and Scheidel (2018: 188). The

much younger Kapp never outlined a comprehensive alternative in any detail, although in his 1936 (German language) thesis he did engage in the socialist calculation debate against (his supervisor) von Mises (see partial translation in Berger, 2016). In Kapp's later work, concerning how to include social costs in decision processes, there are evident tensions between his references to opening-up for participation and writings on setting objective minimum standards that override subjective public opinion (Kapp, 1978).

What this brief summary of positions shows is the variety amongst these authors. This emphasises the need to avoid oversimplification as if Polanyi, Neurath and Kapp represent some common position that fits neatly under substantive economics. Their contributions are interesting for research, but they should neither be simply equated nor so easily identified with a uniform agenda. Their importance is in what they enable us to understand about debates of the past and their insights into alternatives for the future, and they should certainly be a serious part of our studies. Yet, those studies need to be more than classifications into dichotomies and need to maintain criticality. They need to be aware of both insights and mistakes made by past thinkers and aim to move beyond their errors.

In this respect, the substantivist vs formalist debate was later regarded as having been rather fruitless, especially amongst economic anthropologists. Firth (1972: 470) described it as "largely sterile", while noting he had, since the 1930s, agreed with the logic that applying an economic theory concerned with markets and prices is problematic for understanding economic systems that have neither. The substantivist position in economic anthropology was based on Polanyi's concern that conventional economic theory is inadequate for analysing traditional tribal/peasant economies. A new economic theory was deemed necessary and Polanyi (1957a) had developed an institutional approach for understanding markets, and more generally economies, as instituted processes. However, later, the Polanyian position was seen

as too limiting, because it was taken to exclude all aspects of price-making market economies (e.g. competition, forms of market exchange) which might appear, or be implicit, in traditional tribal/peasant economies. Firth (1972: 470), like other formalists, concluded that “a more rather than a less sophisticated knowledge of economic theory is require”, but also that the issue had become where, how far and with what changes economic theory could be applied. That, however, left unanswered which economic theory was relevant, and also implicitly assumed the existing orthodox theory was a valid basis for the analysis (i.e., could explain actual price-making markets). In fact, as Godelier (1977: 21) notes, arguments like those of Firth meant that, formalist and substantivist positons came together due to “the modification, the flexibility, even the surrender, of formalist theses by their own defenders”. The formalist theory was so inadequate it had to be changed beyond recognition.

The basic history of the anthropological debate over the substantive vs formalist approaches and definitions is that economies exist in various forms, they are not singular entities, and the forms vary in how they use different institutions (i.e., conventions, norms, rules and regulations). There is variety in the occurrence of the institutions of competition, markets, trade, money and prices. Anthropologists, like Marshall Sahlins and Maurice Godelier rejected any formal definition of economics, but considered the substantive definition inadequate because it excludes too many concepts simply because they are associated solely with formalist market economies. They moved to a synthesis, borrowing concepts from Marx, that focuses on the combination of productive forces and specific social relations of production and seeks to explain the reproduction of economic arrangements. Economies are understood as consisting of the structure and form of the process of production and the circulation of material goods. Different historical modes of production (e.g., slave, feudal, capitalist) are identifiable as general categories. However, a specific society may also be organised on the basis of several interconnected modes of production, where one dominates

(Godelier, 1977: 18). So, the basic outcome of the formalist vs. substantivist debate in economic anthropology was to side with the substantivist in recognising the need for institutional analysis of society, but broaden the institutional arrangements to include aspects of formalist conceptualisation of price-making markets, while going beyond the empiricism of both to seek analysis of structural causal mechanisms.<sup>3</sup> As Godelier (1977: 62) puts it:

“Only a theory and method which enables us to think and analyse the form, function, the hierarchy and the articulation, the conditions for the appearance and transformation of social relations can hope to take over in a radical way from the impotence of functionalism and structuralism, putting an end to the state of helpless vacillation existing in the human sciences.”

#### **4. False Dichotomising and Confused Epistemology**

Gerber and Scheidel (2018) employ the substantive vs. formal distinction in combination with some rather broad brush merging of epistemology into their argument. This occurs in their attempt to create support for an overarching substantive vs formal division throughout the history of economic thought. Three specific instances of such imposition of the dichotomy occur in the article. First is with respect to the *Methodenstreit*, a debate over methods of inference in late 1800s. Second is with respect to Georgescu-Roegen’s attack on economic ‘methodology’. Third is the dichotomy drawn between abstract and concrete. The point to be made here is that none of these issues in epistemology is best understood by reframing them as aspects of an imagined substantivist vs formalist debate.

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<sup>3</sup> The recognition of the limited insight into reality possible from empirical research means going beyond observation and data to seek the causal mechanism and structure that explain events. This is a position that is totally in line with a critical realist approach to ecological economics (for an introduction see Puller and Smith, 2017), and specifically its depth ontology (see Collier, 1994 Chapter 2).

The *Methodenstreit* was a debate in epistemology between deductivists and inductivists that started from a dispute between Menger and Schmoller (Sandelin et al., 2008: 71). As one of the founders of the then new marginalist theory, Menger was engaged on the side of deductivism and seeking laws. The opponents, led initially by Schmoller, were members of the German historical school who argued for using historical data to seek recurrent regularities. In order to claim that this debate has anything to do with divisions of economic into substantive vs formal would mean equating induction/inductivists with the substantive, and deduction/deductivists with the formal. Besides the absence of any reason for such division, the key people involved violate its conditions.

According to Polanyi (1977c), Menger is the key inspiration for his formal vs substantive definition of economic. Polanyi (1971: 18) references Menger as defining these “two basic directions of the human economy”. Polanyi (1977c: 23) quotes Menger as stating that in “the actual economy” these two directions occur as a rule together and indeed are almost never found separately, despite then claiming this could be a possible regular occurrence in some types of economy. How such a regular occurrence could be possible is hard to imagine. The reason being that, while an economy without economizing activity (the formal definition of ‘economic’) is possible, no economy, nor any human society, can exist without the physical requirements for sufficiency! This emphasises the universal importance of the material aspects of social provisioning and what Polanyi termed the substantive definition of economic. In any case, Menger accepted the presence of both the substantive and formal in actual economies “as a rule”. Yet in the *Methodenstreit* Menger was arguing for deductivism. So being a deductivist has no necessary connection with accepting or rejecting actual economies as having a substantive element, nor does it prevent an economist from accepting the relevance of the substantive definition of economic.

The *Methodenstreit* cannot therefore be taken as having anything to do with the substantive vs. formal definition of economic. Indeed, in contrast to this debate, epistemological pluralism would argue that there is nothing inherently bad about making inferences by deduction as opposed to induction. They each have their benefits and drawbacks. Thus, in his economic textbook, where he later appraised the *Methodenstreit* debate, Neurath saw the whole matter as a pseudo-problem, and like others combined the historical and theoretical approaches (Uebel, 2004: 29). Gerber and Scheidel (2018: 188) place Neurath in the substantivist camp on the basis of his advocacy of multiple indicators in economic planning. However, on the basis of their epistemological division (induction=substantive vs. deduction=formal) he does not fit, but then again this epistemological dichotomy does not have much validity in any case.

This is not to say deduction as being used today in economics is unproblematic. On the contrary, what is wrong with modern economic use of ‘formal’ mathematical deduction is that it is applied regardless of its relevance and has become a prescriptive approach to economics. That is, being an economist is defined by the current mainstream as doing mathematical deduction. In modern times Lawson has extensively and repeatedly criticised the deductivism of orthodox economics, but he also does not reject deductivism as a totally invalid approach for making inferences (for example see Lawson, 2009).

Another claim Gerber and Scheidel (2018: 188) make is that the use of quantification is a designation of being signed-up to the definition of economic as formal, which is clear when they state, using Georgescu-Roegen’s terminology, “arithmomorphism (i.e. formal approaches)”. Inappropriate use of mathematics, not its total banishment, was the concern of Georgescu-Roegen and he cannot be classified simply as a supporter of defining economics as substantive just because he questioned economic ‘mathematical formalism’. The point of

Georgescu-Roegen's argument is much broader than 'formal economics' as defined by Gerber and Scheidel (2018: 189). Indeed his critique of quantification is general and would apply equally to in-kind quantification as to monetary quantification. His concern is about what quantification can and cannot achieve. The conversion of his argument, by Gerber and Scheidel (2018: 188), into a dichotomy between "arithmomorphic (i.e. clear and quantifiable) and dialectical" is particularly strange because the dialectic is about going beyond dichotomies! He actually uses a rather specific definition of dialectical concepts as those that violate the Principle of Contradiction; namely that they are instances in which B is both A and non-A (Georgescu-Roegen, 1971: 46). For example grey is both black and non-black, white and non-white. The usefulness of this dialectic is in legitimising concepts that are in this sense fuzzy, not distinctly definable and certainly not mathematically so. Although, even here he allows that: "arithmomorphic models are definitely useful as simile of dialectical reasoning to facilitate communication and to detect possible logical errors" (Georgescu-Roegen, 1981: 190).

In his paper on the topic entitled '*Methods in Economic Science*' (Georgescu-Roegen, 1979) the concern for a dialectical approach is in the context of the 'mathematisation' of economics. He accepted the validity of the mathematical method of economics, but held that it was restricted to a small field that he termed engineering economics. Georgescu-Roegen does exactly what I argued above is necessary for good science; that is, he criticises the approach on the basis of what it is able to tell about the object of study. His core argument is about epistemology, what we can know. We cannot know everything by using numbers because not everything has the form (morph) of a number (arithmetic). Qualitative information is therefore essential as well. His point is made clear in the following quote:

"modern economics has ignored even the most fundamental qualitative aspects of the economic process. Why have standard economists failed, for example, to perceive the



essential difference between “fund” and “flow”, a failure responsible for several important fallacies mentioned in my article” (Georgescu-Roegen, 1981: 190-191)

However, there is then no *a priori* dichotomy, or choice to be made, between formal (quantification) and substantive (dialectic) as suggested by Gerber and Scheidel (2018: 188). Indeed, Georgescu-Roegen was at some pains to defend himself from simplistic classification as being against ‘mathematical formalism’ as an epistemology. As he stated:

“[...] in order to prevent (as much as may be possible) misinterpretations of my position. I would be among the last servants of science to deny the indispensable role of theory, which must necessarily aspire to be quantitative and hence mathematical, provided “theory” is not separated completely from fact. [...] I would also be among the first to defend the absolute necessity of historical and institutional studies in social sciences, hence in economics.” (Georgescu-Roegen, 1976: xi)

We might disagree with his position on the necessity of mathematics, but that does not change what he stated so clearly. Like Menger, Neurath and Polanyi, he is neither in the substantive nor the formal camps that Gerber and Scheidel try to create on epistemological grounds.

In another area of epistemology, Gerber and Scheidel (2018: 189) conflate formal with abstract and create a dichotomy between abstract and concrete. All research requires concepts and all concepts are abstractions. Similarly, as noted by Georgescu-Roegen above, theory is indispensable. Observation is theory laden and cannot be divorced from our conceptual models of the world. Thus, the common misperception that there is some dichotomy between theory and observation needs to be dispelled (for a clear exposition on this point see Sayer, 1992). The extent to which Gerber and Scheidel fall into this trap is unclear. However, they use the term concrete and appear to link this to empirical, while their Table 1 (see Appendix II) contrasts it with an approach that is abstract, model-driven and deductive (Gerber and Scheidel, 2018: 189). Concrete is introduced with reference to Marx (Gerber and Scheidel,

2018: 187), but the authors give no definition in their paper. In the *Grundrisse* 1857, Marx states: “The concrete concept is concrete because it is a synthesis of many definitions, thus representing the unity of diverse aspects.” (cited in Sayer, 1981: 7). On the basis of Marx’ definition, the concrete is about specifying multiple aspects of an object of study and not equivalent to the empirical because it may involve the non-observable and metaphysical. Marx is noted to have used ‘abstract’ in a derogatory way but there is nothing inherently bad about abstraction. As Sayer (1981: 7) notes, the requirement is for a “general epistemological distinction for discerning misleading abstraction from enlightening or rational abstraction: the abstract-concrete distinction is not enough on its own”. Sayer goes on to offer means for doing so.

## **5. Discussion and Conclusions**

The aim of advocating substantive economics—that ecological economics seek to become “largely about the ‘substantive’ (in ‘kind’) study of the economy” (Gerber and Scheidel, 2018: 186)—appears to be a well meaning redirection away from the excesses of new environmental pragmatism and new resource economics (Spash, 2013). Neoclassical economics is by definition not heterodox and the desire of Gerber and Scheidel is clearly for a non-orthodox approach to economics. There are good grounds within SEE on which to base the rejection of mainstream economics and to create an alternative. However, the core requirement is to address real economies, both past and present, in order to understand how we can transform to a different future.

The reason why a substantive economics cannot be the main foundation for ecological economics is that it is created from a false dichotomy. Menger was wrong to imply the ability to divorce social provisioning from the actual economy; all economies have this substantive element. Polanyi was wrong to create a hard-line between the past non-market (substantive)

and present market (formal) economies, and it is also unnecessary for his core critical arguments. However, in this Polanyi followed a common 19th Century position that contrasted ancient with modern societies based on the former being built around status, instinct, feeling and custom, while the latter involved contract and rational decision-making. In particular, Polanyi's theory—the extension of price-making markets to new areas of social life—borrows heavily from Tönnies 1887 theory of historical evolution (Gemici, 2008). Tönnies argued that human history had consisted of living in mostly natural relations of community (*Gemeinschaft*), but the rise of capitalism had led to, what he termed, a “great transformation” into an artificial society increasingly based on contract (*Gesellschaft*). Although he held that social entities contain elements of *Gemeinschaft* and *Gesellschaft* the change was domination of the latter over the former (Gemici, 2008: 23). Tönnies believed this transformation was irreversible and tragic, but that a new communal age might arise (Dale, 2011: 310). As Gemici (2008: 23) notes, Polanyi develops Tönnies' theory into a general proposition about the changing place of economy in society, but in so doing adopts dichotomies that do not hold (e.g., contract vs. status, divorcing contract from its social and institutional elements).

The attempt to legitimise the Polanyian dichotomy creates further false dichotomies and does not progress our understanding of the existing price-making market economy as emergent from society. If anything the dichotomy divides us off from achieving that understanding, as it did Polanyi's work, which then suffers from an inability to address the social foundations of the price-making market and capital accumulating economy. That is not to denigrate what Polanyi achieved or the insights he gave by emphasising the importance of non-market institutional arrangements, but rather to say we can also recognise what else needs to be done some half century after the debate on this topic subsided in economic anthropology. What we, ecological economists, should take from the ‘substantive economic’ definition is the

insight it provides into the richness and variety of human economies in the absence of price-making markets. What we should avoid is re-establishing and universally imposing a false dichotomy that prevents us from understanding where our current economic system came from, how it operates and how it can be changed. Unfortunately, the dichotomy merely pushed the social aspect of market capitalism off the agenda, not least because the Polanyian formal definition accepted the marginalist model of self-regulating price-making markets (Gemici, 2015). Polanyi then legitimised the approach of neoclassical economics as relevant to the present system as much as he exposed its inapplicability in historical contexts.

In contrast, social ecological economics requires that the ecological and social emergence of economies be taken seriously as relevant to all economies not just historical ones. That is, the ecological and social dependency of the current economy needs to be placed at the forefront of our understanding. The proposal by Gerber and Scheidel (2018) to almost exclusively, or primarily, study substantive economics seems to imply ignoring key aspects of the current economy. If this results in rejecting such things as price-making markets and monetary valuation as valid objects of study then it makes no sense. If our research reveals such things as being bad institutions then it will also inform us as to the direction for change and social ecological transformation of the economy. The issue for research is to investigate the social and ecological aspects of the current market economy and capitalism, just as any other economy.

A formalist economics can never understand the current economic systems because it is setup to accept the validity of the neoclassical model of the marginalist school. The irrelevance of formalism is its failure to recognise that trade and exchange in the market place is always and in every instance a social relationship involving actors and power relationships as well as social structures and institutional arrangements. The strong elements in the substantive

approach can and should be taken forward (e.g., the economy as an institutional process, social provisioning outside of market structures, material and energy flows as the basis of provisioning). A substantivist approach focussed on pre-capitalist economies has proven insightful for social and economic anthropologists, economic historians and archaeologists. However, therein lies the failure of adopting a substantive economics as defining ecological economics, it will not help us address our current system anymore than the formalist definition of economic helps understand the past (or indeed the present).

Adopting an approach built on a dichotomy that completely removes research on the functioning of price-making markets and capitalism defeats achieving social ecological transformation. As Sun-tzu (2003: 19), the 6<sup>th</sup> century B.C. strategist, advises: “Know the enemy, know yourself, and victory is never in doubt, not in a hundred battles. He/[She] who knows self but not the enemy will suffer one defeat for every victory. He/[She] who knows neither self nor enemy will fail in every battle.” We need to go beyond false dichotomies and that includes a way to SEE beyond substantive economics.

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## Appendix I

Below is the relevant text from Gerber and Scheidel (2018).

### *Text from the Introduction*

We argue that ecological economics is largely about the substantive study of economic processes (“in substance”, “in the concrete”) as opposed to the formal approach of neoclassical economics (“in prices”, “in the abstract”). We suggest that ecological economics should assume more consciously the radical implications of the distinction between these two meanings of economics. But what does it imply for ecological economics to be “substantive”? How can it offer a comprehensive “substantive” analysis of the economy? What existing methodological tools are already available, and what can they offer for the study of “substantive economics”?

This article tracks these questions by first outlining some landmarks in the history of the substantive vs. formal dichotomy in economic thought – from Aristotle to the founding fathers of modern ecological economics. We argue that ecological economics as substantive economics can be grounded within a long tradition of debates in economics. We then present a brief overview of the main existing approaches to the study of the metabolism of social systems, a set of approaches that we consider essential for the substantive analysis of economic processes, and arguably ecological economics' most significant contribution towards substantive economics.

### *Text from Section 2 on Milestones in the History of the Substantive vs. Formal Dichotomy*

Whether the study of the economy should be substantive or formal is a fundamental question which runs throughout the history of economic and sociopolitical thought under different names and foci. The debate started perhaps with Aristotle's famous distinction between oikonomia, the wise management of the “household” or community, and chrematistike, the art of making money (Aristotle, 1984 [4th-c. BCE]). For him, whereas oikonomia seeks to address basic needs and the maintenance of the community over time, chrematistics is unnatural and a by-product of personal inclinations and institutions. He added that chrematistics is potentially dangerous because it does not lead to social benefits and real happiness. It goes without saying that ecological economics as substantive economics reclaims the original meaning of the term “economics”.

Substantive economic theory could be traced back at least to Physiocracy (the “Government of Nature”) in the 18th century. This school reacted against mercantilism which was deemed mistakenly focused on monetary wealth, accumulation of gold, and the balance of trade (Meek, 1962). In contrast, the Physiocrats argued that the wealth of nations derived from agriculture, from a Natural order that humans had to understand in order to live in harmony with it.<sup>4</sup> This is remarkable, as most of the subsequent schools of economics have focused on trade and markets. It is also interesting to note that François Quesnay – the leading figure of the Physiocrats – was a medical doctor who wanted to apply the scientific principles of medicine to the study of the economy, seen as comparable to a human body.

As we will see, Karl Marx also resorted to the physiological analogy, but it is here his influential dichotomy between exchange and use values (and abstract vs. concrete labour) that will retain our attention (Marx, 1981 [1857]). Exchange value is the monetary aspect of value and constitutes the bedrock of a commodity's price. Use value, in contrast, is the concrete way in which a thing meets human needs. Marx thought that supply and demand in terms of exchange values could not form the basis of socialism. Exchange values respond to purchasing power but not to everyone's real needs. He thus envisaged the disappearance of exchange values in a mature socialist system, but never specified how such a substantive non-market economy might be organized.

The conceptual opposition between “substance” and “form” was commonplace in 19th century's European philosophy and social thought. “In fact,” writes Berger (2008: 382) “since the substantive-formal distinction runs like a thread through the works of several European economists [...], it may be considered a distinct European contribution to institutionalism”, that is, to institutional economics. Between the 1880s and the 1890s, a foundational debate took place in the German-speaking world, the “battle over methods” (Methodenstreit), opposing the historical economists of Berlin vs. the marginalists of Vienna. At stake was the pretension of the latter to offer a universal theoretical foundation for the study of the economy. The “substantive” historical school (albeit without



using the terms) argued that “formal” market mechanisms and methodological individualism could not explain all economic phenomena and insisted on contextualizing economic life. The Methodenstreit resurfaced later under different forms, as we will see.

Introducing the terms in economics, Max Weber (1964 [1920]) distinguished between “formal” and “substantive rationality”. For him, the former refers to the degree in which activities can be calculated in monetary terms while the latter refers to the degree in which needs are met through economic activity.<sup>5</sup>

Around the same time, Carl Menger – one of the three fathers of marginalism – proposed a related distinction between “formal” and “substantive” approaches to the economy. He wrote in his posthumous and untranslated second edition of the *Grundsätze der Volkswirtschaftslehre* (Menger, 1923: 22): “the economy has two ‘elemental directions’, one of which is the [formal, maximizing] economizing direction [...] while the other is the [substantive, physical] ‘techno-economic’ direction”. Karl Polanyi – influenced by Menger’s distinction – noted that after the rise of marginalism and “because of the brilliant and formidable achievements of price theory opened up by Menger, the new economizing or formal meaning of economic[s] became the meaning” while the “meaning of materiality [...] lost academic status and was eventually forgotten” (Polanyi, 1971: 24, his emphasis). Needless to say, it is this second meaning which, later on, gave rise to ecological economics as a heterodox school of thought studying the socio-biophysical structure of the economy. In fact, the distinction became one of the key ideas of heterodox economics at large.

After World War II, the formalist vs. substantivist debate prominently took place in economic anthropology. Just like during the Methodenstreit, the formalists emphasized the universal claims of neoclassical economics while the substantivists, like Polanyi, gave priority to the empirical content of material circumstances and disputed that this diversity could be adequately grasped through just one set of concepts (Polanyi, 1957).

K. William Kapp’s – arguably the first modern ecological economist – built on Weber and Polanyi and developed a critique of market valuation that he opposed to substantive economic planning (Gerber, 2016). For him, societal needs cannot find “value-expression” in the formal economy based on market prices; they can only be expressed in the substantive economy of human livelihood and social reproduction in interaction with culture and nature. He thus came to the conclusion that a democratic and substantive planning of the economy – either partial or wide-ranging – was the best candidate for overcoming the incapacity of markets to meet basic human needs for all.

This idea is related to the *Naturalrechnung* (accounting “in kind”) of Otto Neurath who also endorsed, like Kapp, Marx’s observation that not exchange value but use value is the source of real wealth and thus quality of life. In the socialist calculation debate of the 1920s, another avatar of the substantive vs. formal debate in economics, Neurath defended the substantivist proposition that a socialist economy should not rely on any single unit of account – be it money, calories or labour hours – but on multiple indicators, including biophysical ones (O’Neill and Uebel, 2015).

Another variant of the formal vs. substantive distinction can be found in Nicholas Georgescu-Roegen’s (1971) two types of concepts: arithmomorphic (i.e. clear and quantifiable) and dialectical ones (i.e. less clearly delimited, not easily quantifiable, but nonetheless essential). Dialectical concepts have a core of meaning, but also a “penumbra” around them where their meaning may change, as in the concept of “needs” or “sustainability” (Georgescu-Roegen, 1971: 45). He argued that most of the concepts with which economists work are in fact dialectical, hence the necessity to be extremely careful with formal, abstract approaches to the economy.<sup>6</sup>

There are many instances in economics where arithmomorphism (i.e. formal approaches) problematically dominates research and policies, as in the monetary quantification of environmental values or in the asserted substitutability of forms of “capitals” (strong vs. weak sustainability debate, see Daly, 1990). At the opposite of such abstractions, socio-metabolic studies intend to offer a concrete, material way of analysing the economy. We argue that they are among the key comprehensive tools at our disposal for pursuing a substantive study of the economy. But before briefly reviewing in the next section the current main approaches to the study of a society’s metabolism, Table 1 recapitulates what is meant by substantive and formal approaches to the economy.

## Appendix II

**Table 1**  
Characteristics of the substantive vs. formal approaches to the economy.

Substantive economics	Formal economics
In "kind", in "substance"	In "money", in the correct "form"
Need-based, focus on use value	Price-based, focus on exchange value
Concrete and field-driven: the economy is an historical construct embedded in society and the environment	Abstract and model-driven: the economy is a deduced structure based on a set of axioms (e.g. <i>Homo economicus</i> )
Value incommensurability (i.e. weak comparability of different categories of values)	Monetary commensurability
Biophysical and socioeconomic indicators, multi-criteria analysis	Monetary indicators, cost/benefit analysis
Socio-metabolic approach to economics	Marginalist approach to economics
Planning-oriented (as in industrial ecology)	Market-oriented (as in carbon trading)

Source: Gerber and Scheidel (2018)





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