

# **Beyond foundations: systemism in economic thinking**

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## **Abstract**

This essay re-considers the age-old dichotomy between individualist and holist approaches to economic research. As a vantage point, I provide a general perspective on the issue of aggregation in economic analysis by identifying several distinct problems associated with the treatment aggregates (i.e. wholes) as well as aggregation (i.e. the process molding individual parts into a whole). In turn I provide a suggestion for constructively addressing aggregation in social research by introducing the concept of systemism, which puts an emphasis on the relations between individual agents or entities constituting an aggregate system. Such a relational perspective implies a mutual interdependence between levels, where individuals are always relationally embedded, allowing for the whole to influence its parts and for the parts to influence the whole. In this essay, I investigate the application of systemism to socio-economic issues in a series of conceptual examples. In closing, I specifically explore the compatibility between systemism as an ontological and methodological concept and heterodox or pluralist approaches to economic research.

Keywords: individualism, holism, systemism, micro-macro link, heterodox economics, Bunge

## **Introduction**

Economics abounds in problems of aggregation. Just think of the classic question asking how the process of market allocation emerges from a series of distinctive individual actions. The basic issue of aggregation affects all economic theories, since the latter inherently deal with either aggregate states (i.e., macroeconomic variables such as GDP, inflation, the interest rate etc.) or the relation of individual actions to aggregate outcomes (e.g. the influence of entrepreneurial decisions on technological development). However, its role is specifically peculiar in current

mainstream economic thought, since methodological individualism strictly demands that all social and economic analysis be based on theories of individual actions.

In this context, this chapter not only aims at illuminating the “microfoundational approach” currently prevailing in mainstream economics, but also provides a coherent alternative framework for conceptually organizing different layers of economic analysis. This alternative framework comes under the label of “systemism” and addresses ontological aspects relating to the relevance and constitution of different economic entities as well as methodological questions carrying implications for the development of adequate theoretical arguments in economics.

In addressing these main questions, this chapter draws not only on arguments occurring in economic contexts, but also imports some ideas from other disciplines. Specifically, it points to an existing concept for organizing and conceptualizing different layers of analysis labeled *systemism*. This approach goes back to a series of contributions made by an eminent philosopher Mario Bunge (see Bunge 1996; 1999; 2000; 2004, among others), who developed the concept of systemism to denote research practices sharing similar features not compatible to traditional conceptions of either individualism or holism.<sup>1</sup> Hence, a systemist viewpoint is applicable to the whole breadth of the social sciences and I think there are several reasons for economists to adopt Bunge’s stance on this question. First, the systemist framework provided by Bunge is suitable for analyzing and comparing a wide range of economic theories, since it is equipped with a rich descriptive apparatus, including clear-cut concepts and a well-developed terminology. Second, being grounded in a general philosophy of science, Bunge’s systemist approach can also be applied outside the social sciences. Third, systemism benefits from a broad philosophical background allowing for addressing and differentiating ontological, methodological and normative aspects. Fourth, systemism combines clarity with flexibility by emphasizing that relevant layers as well as their respective ordering depend on a specific research question at hand, and, hence, it transgresses any simple micro-macro duality. Finally and most importantly, since systemism eschews any kind of *a priori* hierarchical arguments (as it is evident in both neoclassical methodological individualism and naïve/collectivist forms of Marxian holism), it leads to a dynamic perspective on social systems inherently related to questions of social (i.e. ‘aggregate’) change as well as active (i.e. ‘individual’) agency. Especially this final point also

attains a prominent role in Frederic S. Lee's approach to the "micro-macro distinction in heterodox economics" (Lee 2011a, 19). Following Lee, the micro-macro distinction as commonly envisaged is a chimera, since it implicitly suggests a strict demarcation of micro- and macro-related phenomena, whereas viewing the very same phenomena as intrinsically linked and part of the very same social realm provides a much more promising starting point for social analysis. In this respect Fred Lee's take on the micro-macro link in economics is in complete agreement with the systemist approach advanced by Bunge. Systemism in this context can be understood as a well-suited conceptual apparatus that is tacitly underlying Fred Lee's more specific arguments and attempts to model "the economy as whole," without neglecting the aspect of individual agency (e.g. Lee 2011a; 2011b; 2013).

This chapter proceeds as follows. The next section delivers a comprehensive perspective on different problems arising in the treatment of aggregates and aggregation and how these problems may turn into fallacies of composition. In turn, I will introduce the main building blocks of a systemic approach to social science in section three and review some parallels or possible complementarities between a systemist approach and heterodox economics in section four. The last section offers some concluding thoughts.

### **Fallacies of composition and emergent properties: assessing the microfoundational view**

It has already been emphasized, that economics abounds in problems of aggregation. These problems are especially prevalent in mainstream economics due to its reliance on methodological individualism as a basic prerequisite of scientific analysis. To illustrate this claim, consider the following examples of problems and their typical solutions: the aggregation of individual decisions to aggregate market outcomes (Walrasian *tâtonnement*), the aggregation of individual preferences to consistent democratic decision-making (Arrow's Impossibility Theorem), the aggregation of individual states of welfare to social welfare (aggregate welfare functions), the aggregation of individual trading behavior to aggregate bubbles (herding), the aggregation of individual demand curves to aggregate demand curves (the Sonnenschein-Mantel-Debreu Theorem), the aggregation of a diverse set of durable material and immaterial goods used for productive purposes into one economic category (capital) and the assembly of different inputs into

a common output (gross-substitutability of inputs). These examples signify that traditional mainstream economics is indeed confronted with aggregation problems in various contexts.

In what follows I will argue that such aggregation problems give rise to four different types of possible fallacies of composition, which may arise from either a wrong treatment of aggregation or a wrong treatment of aggregates. While the microfoundational approach encounters problems on both ends, the differentiation between aggregation and aggregates is often helpful, especially since in the more careful applications of the microfoundational view a wrong treatment of aggregates is more common than that of aggregation.

### *The simplistic fallacy*

Let us examine the example of Thomas C. Schelling, who, in the introduction to his *Micromotives and Macrobehavior*, posits that “there are easy cases ... in which the aggregate is merely an extrapolation of the individual” (Schelling 1978, 13). According to Schelling these “easy cases” are marked by the fact that the underlying decisions are made completely autonomously—that is, they are completely *unrelated* to the decisions and actions of other agents. Conversely, if decisions are somehow interrelated the resulting situations “usually don’t permit any simple summation or extrapolation to the aggregates,” since they constitute a “system of interactions” (14). Hence, Schelling uncovers a specific aspect of the aggregation problem, namely that any aggregate consists not only of individuals, but also of the relations between these individuals. Ignoring these relations is to commit a *simplistic fallacy of composition* by underestimating the complexity of correct aggregation. This fallacy is prevalent in most of current mainstream macroeconomics (including real business cycles theory as well as dynamic stochastic general equilibrium models) and may lead to an overly simplistic and, hence, deficient understanding of aggregates. In sharp contrast, Schelling is able to anticipate and avoid the *simplistic fallacy* by taking into account the relatedness of agents.

We can translate Schelling’s argument into usual philosophical terms by positing that any aggregate might exhibit so-called “emergent properties” that arise in either wholes or parts if some whole is constituted. For Bunge (1996, 19-23) these emergent properties are essentially

ontological novelties occurring in (social) systems. Thereby, emergent properties may fall into two main groups: first, there are *global* properties of aggregate systems (e.g. a nation's culture or language, a firm's success or failure), which emerge at the level of the system exactly because individual components constitute the latter. Second, individual parts within a system may acquire *relational* properties (e.g. being a daughter or an employee), because they are part of a social system. Since these ontological novelties are properties or features of concrete things, they can carry mechanisms and have real effects. Hence, such emergent properties stand in stark contrast to mere statistical or arithmetic extrapolations, like calculating the mean of a certain variable. Such *aggregate* statistical or arithmetic properties may be useful for describing a certain system, but do not illuminate the actual processes induced by or occurring within a given system.<sup>2</sup>

The *simplistic fallacy* and the importance of relations are well-known in the logical and physical sciences. A typical illustration for the simplistic fallacy is that the difference between the words “dog” and “god” does not reside in their micro-components (the letters d, o, and g) but in the way these are ordered, that is in their relations or structure.<sup>3</sup> The emergent property in this context is commonly called “meaning.” Similarly, it is obvious that if two particles hit a third with equal intensity the aggregate effect is not necessarily attainable by extrapolation. Instead the relative direction of the two former particles has to be analyzed to make a valid statement about the aggregate effect. Obvious examples also stem from chemistry. For example, if a sodium ion  $\text{Na}^+$  shares an electron with chlorine  $\text{Cl}^-$  molecule the resulting  $\text{NaCl}$  molecule has a series of emergent properties with electric neutrality and a specific taste counting among them (see Anderson 1972 or Bunge 2004 for a series of related examples).

So does Schelling solve the problem of aggregation and master the fallacy of composition? The answer to this question is: yes and no. In contrast to much of mainstream economic thought, Schelling indeed resolves the “crucial ambivalence” of methodological individualism (Hodgson 2007, 220) by explicitly employing a relational approach and thereby masters *the simplistic fallacy of composition*. However, Schelling nonetheless overlooks that aggregate patterns eventually constitute “ontological novelties.” While this stance is possibly grounded in Schelling's strong commitment to methodological individualism, it is harmful in various ways,

since it invites other, more subtle fallacies with respect to the treatment of aggregates and aggregation. Let us analyze these fallacies in turn.

### *The static fallacy*

Schelling notes that the difference between the “easy cases,” in which aggregate behavior is a simple summation of individual actions, and the converse cases is simply that the latter “are not easily guessed” (Schelling 1978, 14). In doing so Schelling presents a case for “weak emergence” implying that aggregates lead to unexpected, but deducible results. “Weak emergence” is thus only “an observer-relative property” (Chalmers 2006, 251). So, any failure to account for aggregate results by analyzing individual action must stem simply from deficiencies in human understanding, e.g. observer-bias or a lack of deductive efforts. What is thus absent from the microfoundational approach is that reduction might be either principally *or* practically infeasible, even when adequately modeling individuals and their relations. Principal infeasibility is often directly associated with “strongly emergent properties,” i.e. *global* properties, which cannot be explained by resorting to individuals and their relative setup. The scope of this argument is very general and it is heavily contested, at least in the natural sciences. Practical infeasibility is sometimes also subsumed under the label of “strong emergence” in the sense that initial data (facts, conditions, laws, etc) is never fully available, and even if data is available no definite calculations could be made. This argument is hardly contested, at least in the social sciences and has already been expressed clearly in the alleged heyday of methodological individualism in the first half of the 20<sup>th</sup> century. Back then even decidedly reductionist researchers were aware of the argument of practical infeasibility and, hence, recognized a greater spectrum of compositional fallacies.

Clearly psychology is fundamental to political economy and all the social sciences in general. Perhaps a day will come when the laws of social science can be deduced from the principles of psychology, just as some day perhaps the principles of the composition of matters will give us all the laws of physics and chemistry by deduction, but we are still very far from that state of affairs, and we must take a different approach. (Pareto [1927] 1971, 29)

To overlook the possibility of practical infeasibility systematically—as preached by the microfoundational approach to aggregation—is to commit *the static fallacy*, i.e. to assume that reducibility is always possible and feasible. Such a stance holds that no unexplainable properties can emerge in any given system and, thus, any unexpected aggregate outcome is to be attributed to the deficiencies of the observer.

### *The dogmatic fallacy*

Following this microfoundational perspective there exist only two routes to deal with emergent properties: Either we know some individual characteristics allowing us to directly deduce these properties, or we may spot some pattern in an aggregate system, which is in turn to be explained by assuming appropriate individual characteristics.<sup>4</sup> The methodological imperative inherent in this dualism complements the idea that reduction is always feasible with the postulate that reduction is a necessary prerequisite for understanding. This imperative, that “only to reduce is to understand,” is also explicitly espoused by Schelling.

If we see pattern and order and regularity, we should withhold judgment about whether it is the pattern and order of a jungle, a slave system, or a community infested by parasitic diseases, and inquire first of all what it is that the individuals who comprise the system seem to be doing and how it is that their actions, in the large, produce the patterns we see. (Schelling 1978, 22)

The “microfoundational approach” prevalent in current mainstream economics mainly rests on understanding reduction as the sole and best way to achieve understanding about aggregate patterns and constellations. And indeed, the history of the natural sciences is full of examples for the success of micro-reduction in enhancing our scientific understanding. However, a *purely* microfoundational approach amounts to ignoring that emergent properties are ontological novelties and, thus, may carry real effects. Since the latter aspect is the most important characteristic of an emergent property, a microfoundational approach eventually leads to ignoring emergent properties at all. In other words, the microfoundational approach espoused in

current mainstream economic thought commits *the dogmatic fallacy*, i.e. to willfully abstain from studying mechanisms at the level on which they are located. Since science is interested in mechanisms of all kinds there is no point of consciously abstaining from studying these mechanisms by enforcing reduction as the prime and only approach to social analysis. Quite on the contrary, any mechanism can and should be studied in its own right no matter on which level it operates. Avoiding such analysis eventually constitutes a “serious omission because mechanisms—such as those of diffusion, clumping, negative feedback, metabolism, cooperation, competition, mediation, and debate—happen to be processes in material complex things, *not in their individual constituents*” (Bunge 2004, 183, emphasis added). By forcing a reductionist view on these phenomena we therefore inherently limit our understanding.

Taking into account the *dogmatic fallacy* when studying social mechanisms is of vital importance if situations are complex, that is, when “it is not a trivial matter to infer the properties of the whole” even when “the properties of the parts and the laws of their interaction” (Simon 1962, 468) are given. In this context, Herbert Simon emphasized that complex arrangements often require flexible and versatile approaches, while a sole focus reduction would lead to overly narrow research strategies. Hence, Simon’s argument that “[i]n the face of complexity, an in-principle reductionist may be at the same time a pragmatic holist” (468) implies that studying mechanisms at the level where they are located is a well-suited antidote to reductionist parochialism.

### *The hierarchical fallacy*

The final flaw of the microfoundational approach is to neglect that emergent properties as ontological novelties carry mechanisms and, thus, bear the possibility of downward causation—that is, macro-phenomena influencing individual action. Ignoring this possibility of downward causation is to commit *the hierarchical fallacy* by a priori assuming that mechanisms only work bottom up. This assumption strongly restricts the scope of the microfoundational approach and is the reason why aspects of downward causation are completely missing in Schelling’s famous “checkerboard model” (Schelling 1969; 1978; Sugden 2000), which explains spatial racial segregation simply in terms of individual preferences. This focus implies that racial segregation

is to be seen as a matter of individual preferences and not as “the result of active racial discrimination”, i.e. as part of a top-down process (Bunge 2004, 194). This viewpoint, contrary to Schelling, would emphasize the importance of social prejudice and structural discrimination. Such an argument alludes to a form of downward causation, where social structures influence individual agency without determining the latter. In economics such an argument takes the form of “macro-foundations,” which are deemed relevant for fully understanding micro-level behavior (King 2012, 42-45). From such a viewpoint “there can be no hierarchical stipulation that macro-theories require a microeconomic foundation to obtain full validity. One could just as well demand a macroeconomic foundation for microeconomics, when the latter finds it difficult to fit macroeconomic realities into its own framework” (Rothschild 1988, 14). And indeed such “macro-foundational” assumptions, like the assumptions of full employment and general equilibrium in the context of partial market analysis, are often made in mainstream microeconomic theory.

It should be noted that downward causation is a commonplace in the natural sciences and can often be explained by recourse to micro-level arguments (Andersen et al. 2000). For instance, the weight of the sun is simply the sum of weights of individual particles (mostly hydrogen). However, this cumulative weight in turn produces strong downwardly causal effects, since it triggers a process of nuclear fusion, when individual hydrogen atoms are fused into helium. Thereby, the process of fusion differs with respect to the exact weight of the aggregate compositum, i.e. the respective star.<sup>5</sup>

### *Taking Stock*

Return to Schelling’s checkerboard model. Even in its most basic variant Schelling explicitly introduces an argument about who is related to whom (there are two types of agents and any agent has relations to her neighbors) as well as the effect of relations in his model (if some proportion of neighbors is of the other type the agent tries to change his position). This consideration of relations is exactly why he is able to go beyond mere summation or, in other words, why he is able to avoid *the simplistic fallacy*. Similar things could be said about related examples such as Akerlof’s (1970) ‘market for lemons,’ where relations are specified as

asymmetric informational endowments, or Fehr and Schmidt's (1998) 'inequality aversion,' where concern for others prominently enters agents' utility functions. This observation is decisive. If aggregation does not account for the relations of individual agents, but only sums up their individual characteristics, the resulting *aggregate* property is by definition unsuitable to capture any emergent properties.

We find approaches to aggregation problems similar to Schelling's in diverse areas of mainstream microeconomics: one of the most important is the Sonnenschein-Mantel-Debreu condition that explicitly addresses that while we can access the sum of individual demands at a given point in time by simply summing up individual demands, the very same argument does not hold for individual demand curves (Kirman 1992). Here, the logic is similar to Schelling's basic case: while individual demands at a given time are independent from each other, an individual's reaction to a change in price indeed depends on the reaction of other individuals and, thus, the aggregation of individual demand curves is possible only under very restrictive conditions, which require the assumption that all individuals have homothetic and identical utility functions. Consequently, this assumption also pervades neoclassical macroeconomics and is one main reason for assuming a single representative agent (Kirman 1992; Gun 2004)—that is, this assumption resorts to extrapolation in order to avoid any variant of emergent properties in mainstream macroeconomics.

In alignment with the microfoundational approach, the possibility of "strong emergence"—that is, currently or principally unexplainable emergent properties like unforeseeable shifts in the evolution of preferences induced by the interplay between product innovation on the supply-side and learning-effects on the demand-side (Witt 2001)—is excluded a priori. The same holds for downwardly causal effects, i.e. the possibility that some mechanisms located at the level of the system, like the social mediation of preferences (Veblen 1899, 43-62), might influence individual demand.

In sum we have identified four different constellations or cases, which might give rise to different "fallacies of composition" resulting from a microfoundational view. Table 6.1 provides a summary of these four constellations.

	<b>Linear Aggregation</b>	<b>Weak Emergence</b>	<b>Strong Emergence</b>	<b>Downward Causation</b>
<b>The “aggregation problem”</b>	Aggregate properties can be derived by a linear extrapolation or summation of individual properties.	Aggregate properties are novel: they differ from the individual’s, but can be derived from the latter.	Aggregate properties are novel: they differ from the individual’s and cannot be derived from the latter.	Aggregate properties influence the behavior of individual elements.
<b>Economic Example: Product Markets</b>	Aggregation of individual demands	Aggregation of individual demand curves	Innovation in market environments.	Social mediation of preferences.
<b>The microfoundational view</b>	Treatment of aggregation: “ <i>the whole is nothing more than the sum of its parts.</i> ”		Treatment of aggregates: “ <i>wholes cannot be explanatory—they do not carry mechanisms.</i> ”	
<b>Resulting “fallacy of composition”</b>	<i>The simplistic fallacy:</i> underestimating the complexity of aggregation, i.e. ignoring relations.	<i>The static fallacy:</i> ignoring the possibility of arising novelties not explainable with (current) micro-knowledge	<i>The dogmatic fallacy:</i> ignoring that complex higher-level mechanisms can be studied on their own	<i>The hierarchical fallacy:</i> ignoring the possibility of downward causation

Table 6.1 A typology of aggregation problems and corresponding fallacies of composition

Our examples suggest that, ironically, current mainstream microeconomics seems to exhibit greater awareness for problems of aggregation and fallacies of composition than current mainstream macroeconomics. In the latter, all of the above fallacies are prevalent, since the macroeconomic system is interpreted as a mere extrapolation of a single, “representative” individual (Kirman 1992; Gun 2004; King 2012, 118–122), while in mainstream microeconomics at least the *simplistic fallacy* is partially addressed.

In order to cope with the full scope of possible fallacies of aggregation I suggest to adopt a systemist approach to provide a suitable methodological and ontological framework for detecting and avoiding these fallacies.

## **Systemism: main features**

While the concept of systemism might seem new, one can be assured that the practice from systemism is far from something completely novel. In his diverse assessments on systemism, Mario Bunge cites a variety of examples for what he conceives as a “systemist” social research. Interestingly, Bunge makes reference to some eminent heterodox economists—in particular, John Maynard Keynes and Wassily Leontief (Bunge 2004, 187), Max Weber,<sup>6</sup> Joseph A. Schumpeter, Thorstein B. Veblen, and K. William Kapp (Bunge 1999, 92-93). Bunge’s observation implies that from a philosopher’s viewpoint heterodox economics, unlike mainstream economics and most of other social sciences, offers significant insights into the economy and society as a system. Therefore, although there is a notion of *ad auctoritatem* in this observation, it suggests that heterodox economic approaches could serve as natural candidates for illustrating a systemist approach to social and economic issues. Before fully exploring this possibility I will give a short introduction to “systemism.”

For Bunge every item or entity is either “a system or a part of one ... a *system* is a complex object every part or component of which is connected with other parts of the same object in such a manner that the whole possesses some features that its components lack—that is, emergent properties” (Bunge 1996, 20, original emphasis). Thus, he conceptually ties the concept of a system to the idea of related nodes forming an aggregate with some emergent properties. These emergent properties carry mechanisms, whose effects lead to continuous changes and stabilization of a given system,<sup>7</sup> which is why we conceive of them “as a process (or sequence of states, or pathway) in a concrete system, natural or social” (Bunge 2004, 186). Thereby, these mechanisms are mostly “concealed” and, thus, “have to be conjectured” (186). Some mechanisms are “essential” in that they are unique to a given system (193) and that they potentially carry “specific” functions that may be used to achieve specific goals. Bunge emphasizes that mechanisms and functions are decidedly different from each other, as the former answer how things work, while the latter show how to achieve a given aim. However, functions and mechanisms can be mapped on each other. In this context the function-mechanism relation is principally a one-to-many one, since different mechanisms can be used to achieve a specific aim. Success on markets, for instance, is determined by different mechanisms and, hence, “markets

can be conquered” on different ways, e.g. “by force, dumping, free-trade agreements or even honest competition” (194).

Additionally, any system is characterized by a specific *composition* (the set of nodes), an *environment* and a certain *structure or organization* (the collection of relations between the nodes as well as between the nodes and the environment). The latter is a novel and necessary element of any system as well as the source of emergent properties and, hence, mechanisms. While this basic concept of a system can be applied to a variety of concrete or even conceptual items, we can for the matter at hand explicitly apply it to social systems, like a family, a firm or a nation. Thereby, novel properties emerge at the level of the whole system (global properties, like a firm’s success or failure) or at the level of its individual components (relational properties, like the role assigned to a given employee).

The main contribution of systemism from a practical perspective is its capacity of putting the most interesting aspect of any system and structures therein—e.g., the organization of relations—at the center stage. By focusing on the relations between individuals it aims to transgress the traditional dichotomy of an individualist and a holist approach and thereby to preserve “the grains of truth” involved in these approaches. In doing so, systemism “handles wholes without being holistic and studies their individual components without being individualistic” (Bunge 1996, 281). Following this argument Bunge juxtaposes systemism to individualism and holism by referring to three different layers: ontology, methodology, and morals (Bunge 1996; 2000). Table 6.2 gives a stylized representation of the differences between three distinctive approaches with respect to three different layers. This illustration indicates that systemism indeed comes as a rather full-fledged concept.

	<b>Individualism</b>	<b>Holism</b>	<b>Systemism</b>
<b>Ontology</b>	A society is an aggregate of persons – any super-individual totalities are fictitious.	A society is whole transcending its members due to emergent and non-reducible collective properties.	A society is a system composed of changing subsystems and has global properties, both reducible and non-reducible.

<b>Methodology</b>	Social science is the study of the individual and to explain a social fact amounts to explaining individual action.	Social science is the study of social wholes, since only they may constitute social facts, which in turn determine individual behavior.	Social science is the study of social systems; their changing composition, environment and structure as well as the mechanisms they bring forth.
<b>Morals</b>	Only individuals can be morally valuable and, hence, should have the liberty to pursue their self-interest.	Social wholes, like nations or families, are maximally morally valuable. Individuals are valuable to the extent that they contribute to social wholes.	Whereas all individuals are morally valuable, those who render useful services to others are more valuable than those who harm others.

Table 6.2 Individualism, holism and systemism in comparison (based on Bunge 1996, 243-268)

According to the systemist view social science is the study of social systems as well as their components. In this respect, systemism is compatible with a broad range of heterodox approaches trying to include both, social structure as well as individual agency. Recent examples for such approaches are supplied by an understanding of economics as the study of the social provisioning process (Lee 2011a) or the postulate of evolutionary economists to focus on the meso-level of economic activity (e.g. Dopfer, Foster and Potts 2004).

Thereby systemism explicitly rejects the *dogmatic fallacy* that ‘only to reduce is to understand’ by emphasizing that “every system must be studied on its own level as well as analyzed into its interacting components” (Bunge 1996, 266). Moreover, since it takes into account relations between individual nodes, it is also well equipped to deal with the *simplistic fallacy*. Finally, since emergent properties are conceived as ontological novelties, which in turn may carry mechanisms, systemism also anticipates the *static* as well as the *hierarchical fallacy*. To sustain the coherence of the approaches collected in Table 6.2 ontological and methodological arguments have to be closely intertwined in all three cases, while the normative part on morals is to be seen as less obliging. Nonetheless, the moral aspect provides an interesting juxtaposition of a systemist viewpoint to the more common variants of a moralist interpretation of individualism and holism.

Given that some systems may be necessary to constitute others (e.g. “subsystems” such as firms and families that might constitute a “supersystem” such as a market for consumption goods), there is a natural hierarchy of levels within the realm of human activity. Therefore, what is conceived as either the “micro” or the “macro” strongly depends on the question at stake. From a bird’s eye’s view, it makes a lot of sense to schematically structure levels in social analysis not in a dichotomic micro-vs-macro perspective, but instead as a gradual movement from a pico- or nano-level (with a single individual person as central reference point) to the mega- or giga-level (e.g. transnational corporations and organizations, international relations, globalization). While this arrangement is far from fully original, it is suitable for conceptually organizing and comparing different research settings (Bunge 1996, 278-279; 1999, 73).

Finally we arrive at a consistent vision of micro-macro interaction in social science. First, it assumes that the “social sciences study social systems and their subsystems and supersystems” (Bunge 1996, 273). Second, it recognizes that any system carries emergent properties as ontological novelties, which may come in two forms—either the system possesses some properties that its parts do not possess (*global* properties), or the parts possess some properties exactly because they are part of a given system (*relational* properties). Thereby, the approach to understand emergent properties as ontological novelties is rather universal take on the question whether “more is different.” It summarizes one basic answer to this question, namely the idea that “at each new level of complexity entirely new properties appear” (Anderson 1972, 393), which takes the form of ontological novelties. Third, systemism posits that different ontological levels in social research—no matter where these levels are exactly located in a given application—are bridged by mechanisms (additionally to within-level mechanisms), which replace those simple aggregation rules that are exemplified by typical formal procedures (e.g., summing up, calculating a mean, classifying, etc.). The question of “aggregation” is thereby explicitly tackled as a potentially interesting theoretical problem and not primarily as a technical difficulty. The very same argument holds when analyzing top-down effects. Hence these “bridging” mechanisms can take the form of agency-structure relations (i.e. a bottom-up mechanism or upward causation) or structure-agency relations (i.e. top-down mechanisms or downward causation).

Based on this conceptual groundwork, Bunge develops a series of examples to illustrate the practical implication of a systemist approach. I will reproduce two of them here and, in turn, apply the very same logic to typical economic examples.

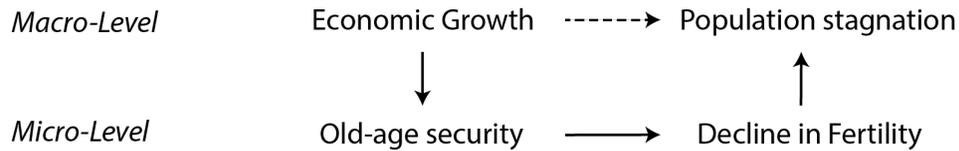


Figure 6.1 From economic growth to population stagnation (Bunge 1996, 281)

Figure 6.1 is basically a stylized representation of a simple hypothesis for explaining the often observed correlation that higher economic growth leads to a decline in fertility and, hence, to a slow-down or even a stagnation of demographic growth. Three main mechanisms are involved in this argument. First, it assumes that higher economic growth allows for (privately or publicly) insuring one's old-age security at the micro-level (a structure-agency relation). Second, it posits that these forms of welfare provision for the elderly reduce the individual incentive to bear and raise children (a within-level mechanism). Third, it asks for the effects of individual fertility decisions on demography—for example, a decline in fertility might lead to a reduction in demographic growth (an agency-structure relation). Taken together, these three mechanisms provide a specific rationale for a fourth one, which depicts the overall argument regarding the observed macro-level development that an increase in economic prosperity leads, quite contrary to what Malthus predicted, to a corresponding decrease in demographic growth.

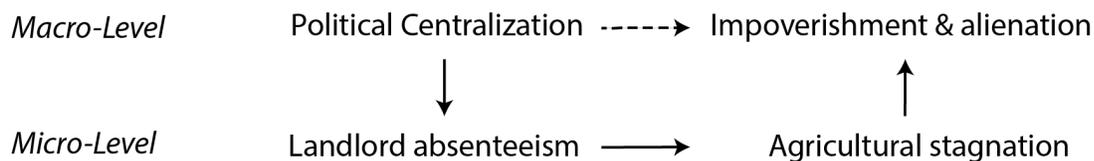


Figure 6.2 Toqueville's analysis of the *Ancien Regime*

Source: Bunge (2000, 151)

Our next example relates to 19<sup>th</sup> century France, which has been extensively analyzed by a contemporary historian Alexander de Toqueville. One of Toqueville's (1856) arguments presupposes that the high political and economic concentration in 19<sup>th</sup> century France caused rural nobility to disregard their landholdings in favor of conducting businesses (or intrigues) at the royal court. This "landlord absenteeism" in turn led to relative economic stagnation, especially in the agricultural sector, where technical and organizational improvements strongly depended on the individual capabilities of landlords. For Toqueville this dysfunctional state of affairs is not only a main reason for widespread poverty found especially in rural areas, but also partly explains the comparatively better economic development in the UK at the same time.

Such arguments on micro-macro-interactions also allow for the introduction of positive feedback effects working in one way or the other. With respect to the example of 19<sup>th</sup> century France, one might argue that the relative decrease in agricultural productivity made court-related business even more attractive for rural-landlords, which in turn intensified economic and technological retardation within the agricultural sector. Similarly, Bunge argues a decrease in political honesty at the aggregate level might deter ambitious and honest young women and men to enter the political sphere, which in turn contributes to a further deterioration of the moral standards prevailing in political discourse and decision-making (he labels this alleged process as "Gresham's Law of Political Apathy," see Bunge 2004, 192).

These examples show that what Bunge's concept of systemism offers is far away from a methodological straight-jacket. Quite on the contrary, the schematic approach utilized in these examples provides some simple tools for expressing and conceptualizing theoretical relationships with special attention dedicated to micro-macro interactions. In what follows I will apply this basic logic to some examples related to heterodox economic arguments and theories.

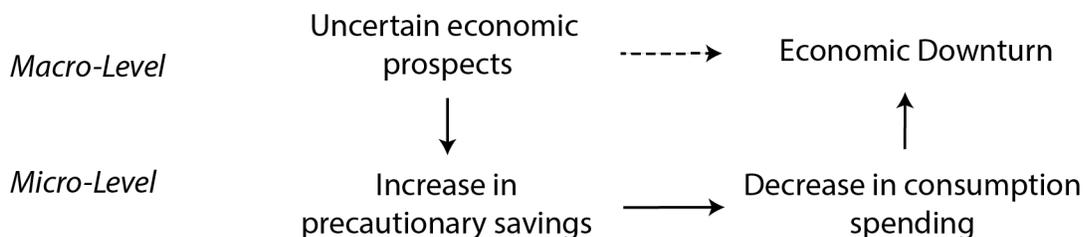
### **Systemism and heterodoxy**

As we have already seen, there is some affinity between a systemist approach to science in general and heterodox economics. This affinity is partially related to the evaluation of past

theorists (heterodox economists often turn out to be systemists from a methodological perspective). However, the very same affinity also relates to conceptual issues like the possibility of downward causation (in the form of structure-agency relations), the emphasis on complexity or the basic idea that an individual constitutes “the ensemble of social relations” (Marx and Engels [1845] 1962).

Therefore, it comes as no surprise that we can use similar theoretical sketches as used in the preceding chapter to illustrate well-known heterodox economic arguments from a systemist perspective. Our first example is the “paradox of thrift.” This paradox postulates that the collective aim to increase savings will be unsuccessful, exactly because it is a collective aim. The intuition behind the paradox of thrift is as follows: If agents collectively try to increase their savings, they will reduce spending and thereby also decrease their aggregate income. This decrease in income might in turn render any individual ambition to increase savings obsolete.<sup>8</sup>

Figures 6.3 and 6.4 present the paradox of thrift in two variants. In the first variant the paradox of thrift is conceptualized as a self-fulfilling prophecy where uncertain prospects lead to an increase in precautionary savings, which reduces expenditures, lowers income and, hence, renders economic prospects even more uncertain or even gloomy.



*Figure 6.3* The paradox of thrift as a self-fulfilling prophecy

In the second variant the paradox of thrift is presented as a self-defeating prophecy. In this scenario increased savings are not the result of rising pessimism, but are rather induced by experts’ or politicians’ advice for economic consolidation of households and firms by means of increased private saving. In both cases self-reinforcing effects obviously play a crucial role.

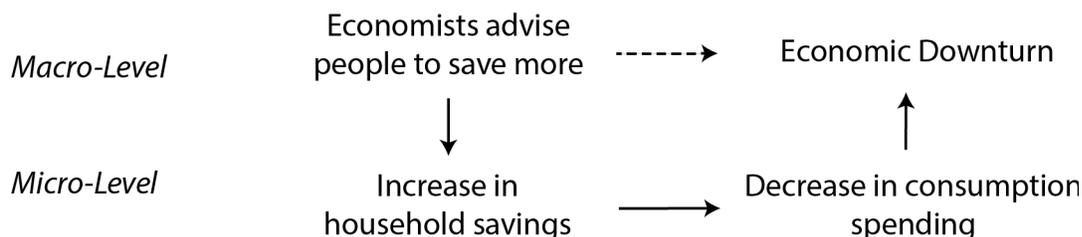


Figure 6.4 The paradox of thrift as a self-defeating prophecy

Another classic heterodox line of argument that can be illustrated in such a simple, interactive micro-macro framework is Hyman P. Minsky’s financial instability hypothesis stating, in short, that “stability breeds instability,” or more specifically:

A period of successful functioning of the economy leads to a decrease in the value of liquidity and to an acceptance of more aggressive financing practices. Banks, nonbank financial institutions, and money-market organizations can experiment with new liabilities and increase their asset-equity ratio without their liabilities losing any significant credence. (Minsky 1986, 249)

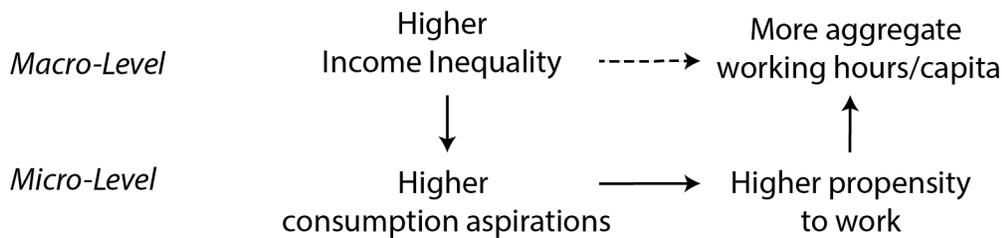
This kind of financial expansion anchoring in economic stability can again be expressed in a schematic form including macro-to-micro (or structure-agency) as well as micro-macro (or agency-structure) relations accompanied by within-level mechanisms. It thereby employs both upward and downward causation in expressing a global macro-mechanism.



Figure 6.5 The financial instability hypothesis in a systemist framework

The use of such approaches for a conceptual work in designing and evaluating theories is thereby not limited to classical arguments relating only to two levels of interaction but can also be

applied to more current research and can thus be extended to include additional ontological layers. An example for the first feature—the applicability to more current research—can be provided with reference to Bowles and Park (2005), which suggests a positive relationship between income inequality and aggregate working hours (a global macro-mechanism) based on theoretical and empirical arguments. Specifically, they use the Veblenian concept of social emulation by arguing that consumption preferences are transmitted via social relations and, hence, increase with increasing income inequality, since the consumption of top income groups grows faster than average consumption. Bowles and Park argue that one way to actually live up to the increased consumption aspirations induced by the increase in inequality is to aim at an increase in hours worked to afford additional consumption expenditures. Hence, they provide a global macro-mechanism, with a more specific and detailed explanation, which also incorporates an argument operating at the micro-level. Note that this approach is far from being microfoundational from a conceptual point of view, since we find that a macro-level mechanism (from aggregate inequality to individual hours worked) proceeds within social systems (in this case nation states) by inducing processes among individual parts of the very same system via downward causation and social relations. Figure 6.6 summarizes this argument in a graphical form.



*Figure 6.6* Thorstein Veblen and working hours according to Bowles and Park (2005) in a systemist framework

My final example relates to the possibility of extending such a systemic framework to include additional layers (see Kapeller and Schütz 2013). Specifically, we developed a dynamic and stock-flow consistent Post Keynesian economic model (Kapeller and Schütz 2014), where inequality within the working class increases. As a reaction to increasing inequality, those workers who fall back in terms of income are affected by Veblenian conspicuous consumption

motives and, hence, try to compensate these losses by incurring additional debt. As a consequence demand for credit is increasing. This setup is complemented by the introduction of a Minskyian banking sector roughly conforming to the mechanism depicted in Figure 6.5: stable economic conditions decrease risk-management standards in the banking sector and contribute to the creation of financial innovation, both of which lead to an increase in credit supply matching the increased credit demand by households. If households eventually incur debt to afford additional consumption, the economy will experience a boom-phase due to increased aggregate demand, which ceases only if either inequality decreases or credit requirements are again increased in the face of rising systemic risk. In the corresponding model only the second option is implemented, which leads to a decrease in economic activity due to more restricted lending conditions and bankrupts within the household sector, which further reinforce lending restrictions. This self-propagating spiral finally leads to recession in the economy, which forces households to repair their balance sheets. In a full-fledged framework such a model delivers an economy exhibiting a constant cyclical behavior labeled as “Minsky-Veblen Cycles.” However, as is illustrated in Figure 6.7 the main aspects of the model can still be relatively easily expressed in a systemist fashion by representing the model’s main mechanisms as well as their chronology and relative impact. In a second step we can graphically illustrate these relationships by referring to three different layers: that is, households at the micro-level, the banking sector at the meso-level, and the aggregate economic behavior at the macro-level.

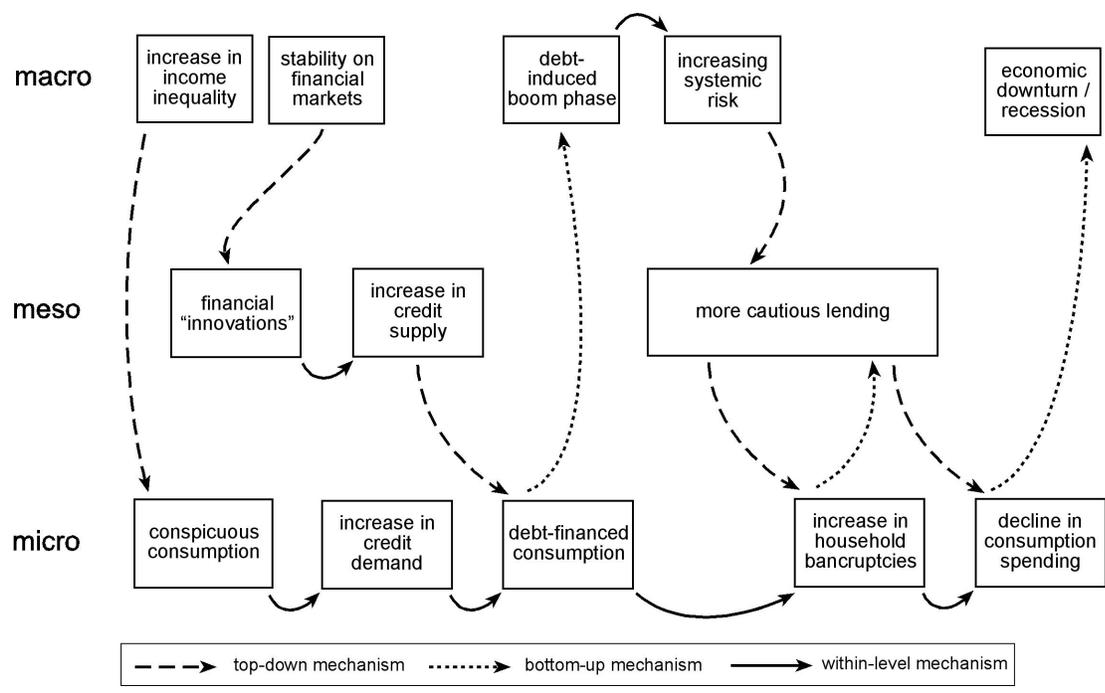


Figure 6.7 Minsky-Veblen cycles in a systemist framework

Source: Kapeller and Schütz (2013, 521)

## Conclusions

The main and obvious aim of this chapter is to provide a constructive and philosophically sound perspective on the question of reductionism in economics. In this respect this chapter makes two main contributions. First, by distinguishing different forms of aggregation problems as well as their corresponding fallacies of compositions it gives a precise and specific account of the rather general notion that “the whole is something more than the sum of its parts.” This analysis in turn points to a series of fundamental weaknesses associated with the microfoundational approach prevailing in current mainstream economics. Second, it provides a specific suggestion on how to think about handling different layers of analysis in social research by referring to systemism as a conceptual anchor for heterodox economic practice. It is shown that a systemist approach is not only highly compatible with arguments to be found in heterodox economics, but also provides heterodox economics with a solid and highly consistent ontological and methodological foundation.

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## Notes

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<sup>1</sup> As such systemism bears no direct relation to systems theory as advanced by Niklas Luhmann (see Wan 2011 for a treatment of this relationship). Instead Bunge rather points to the works of Raymond Boudon or James Coleman as archeotypical for a systemist approach. The fact that these two authors self-identify with methodological individualism, is not decisive here, since they “practice the systemic approach even while preaching an individualistic one” (Bunge 1996, 148).

<sup>2</sup> Descriptive results stemming from statistical or arithmetic extrapolations are explicitly labeled as “aggregate properties” in Bunge’s approach.

<sup>3</sup> Nagel (1952) suggests a classic and more elaborate example based on comparing the ordered class of all natural numbers  $K$  with another class  $K^*$ , which is equal to the conjoined set of the ordered classes of even ( $K_e$ ) and odd number ( $K_o$ ) so that  $K^* = \{K_e, K_o\}$ . As in the example given above the microelements of the classes  $K$  and  $K^*$  are equal, while their relations differ.

<sup>4</sup> The strategy to spot a specific aggregate pattern and in turn explain this pattern by assuming an appropriate micro-setup, can be found in many famous models, e.g. Schelling’s checkerboard model of racial segregation (Schelling 1969), Akerlof’s ‘Market for Lemons’ (1970) or Fehr and Schmidt’s ‘Inequality Aversion’ (1999). One of the first examples from modern economics is Adam Smith’s *Theory of Moral Sentiments* (Smith 1759). Smith develops assumptions on individual dispositions (like sympathy and the impartial spectator) to explain the allegedly rather harmonious social order, which served as Smith’s main intellectual puzzle.

<sup>5</sup> While in the sun and similar heavy stars helium is produced via the successive fusion of hydrogen atoms, in heavier stars (with more than 1.3 times the mass of the sun) carbon, nitrogen and oxygen also play a role in the creation of helium through nuclear fusion.

<sup>6</sup> With regard to Max Weber, Bunge notes that while Weber did preach individualism, he practiced systemism (Bunge 2000, 149; see also Albert 2005 for a similar argument).

<sup>7</sup> In this very Schumpeterian notion Bunge not only analyzes the market as a volatile system and identifies “innovation” as its “essential” mechanism, but also gives due credit to Schumpeter for pinning down this mechanism “in a single magisterial page” making him stand in sharp contrast to “neoclassical economists, obsessed like shopkeepers with price competition” (Bunge 2004, 189).

<sup>8</sup> To illustrate this argument one can assume a simple model where aggregate income is equal to aggregate expenditure, which is the sum of consumption spending and investment, i.e.  $Y = C + I$ , where  $C = c_1 Y$  and investment spending is autonomous. If, we now take  $c_1 = 0.9$  and  $I = 100$ , aggregate income  $Y$  is equal to 1000 and aggregate savings are equal to 100. Now, assume that households want to double their savings by doubling their savings rate  $(1 - c_1)$  from 10 to 20 per cent, which decreases  $c_1$  to 0.8. In turn aggregate income is reduced to 500, where one fifth of this income is saved. Hence, aggregate savings stay constant at 100, since there has been an economic downturn due to the decrease in consumption spending.