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## Abstract

At its core, the discussion on the micro–macro link in heterodox economics is concerned with the correct treatment of aggregates and aggregation in social theory. In this chapter we survey heterodox approaches to the micro-macro link with a focus on shared understandings and convictions that apply across different schools of thought. In addition, we illuminate typical fallacies related to the treatment of aggregation and aggregates as well as the philosophical underpinnings of heterodox ontology to better understand conceptual differences between heterodox economics and competing approaches. Given that economics faces myriad problems of aggregation—as in the case of market interaction, macroeconomic aggregates, or interpersonal coordination and contracting—the quest to provide suitable conceptual tools and philosophical foundations to adequately address aggregates and aggregation should be of special interest to economists of different persuasions.

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## Introduction

Any discussion of the micro–macro link in heterodox economics entails two main questions. The first question is relevant for social sciences in general and asks for the correct or adequate treatment of aggregates and aggregation in social theory. Any exhaustive answer to this general question incorporates a series of philosophical aspects including (a) general ontological claims (for example on whether social and economic aggregates exist), (b) epistemological prescriptions on how to conceptualize aggregates and aggregation and (c) methodological guidelines on how to disentangle the coevolution of structure and agency in applied work. Given that economics often directly deals with (macroeconomic) aggregates and faces myriad problems of aggregation – such as market interaction and price-setting, interpersonal coordination and the emergence of social rules or the vexing question of social welfare – the quest to provide suitable theoretical and empirical tools to adequately address aggregates and aggregation is of interest to economists of different persuasions.

The second major question is more specific and asks for similarities and differences in the treatment of aggregates and aggregation among heterodox economists. In this respect, we argue that a consistent vision of the micro-macro link in heterodox economics exists, although some heterodox economists may prioritize either micro-, meso- or macro-level analysis. In our view, the underlying shared intuition across different heterodox approaches is that social outcomes not only (1) jointly depend on the actions of all individuals involved, but also (2) feedback unto individuals. The first aspect emphasizes that *relations among individuals* matter and captures the mutual dependency of our actions as visible in classic accounts of circular flow (paradox of thrift), the role of expectations (beauty contests) or social dilemmas (prisoners' dilemma). The second aspect refers to the importance of aggregate outcomes for individual action and reflects an emphasis on social embeddedness, inequality and related pervasive power structures.

Against this backdrop, this chapter suggests a unified heterodox approach to the micro-macro link in economics. The first section emphasizes the analytical problems that may arise from popular misunderstandings about the relationship of individual and aggregate levels. In the second section we show that different heterodox approaches to the micro–macro link in economics are not only consistent, but complementary to each other and allow for a concise treatment of the micro–macro link in economics based on a set of shared fundamental principles. The third section embeds the heterodox economic view on aggregation in a 'systemist' framework and demonstrates that heterodox economic theory and research practice can be substantiated by a more general, philosophical perspective on aggregation in science. We argue that such a general philosophical framework not only opens possibilities for advancing heterodox theory, but also

establishes new means for interdisciplinary collaboration by making, because it provides scholars from different heterodox schools a consistent meta-language that accessible from a broad range of disciplines ranging from physics (Anderson 1972) over history (Bunge 2004) to gender studies (Walby 2016). The last section offers some concluding thoughts.

## **Aggregates and aggregation in science: a collection of compositional fallacies**

Scientific endeavor often deals with the relation between aggregate entities – a family, a nation or a firm – and their individual constituents – family members, citizens, or employees. In disentangling this relationship between the ‘whole’ and its ‘parts,’ errors may occur, which can be understood as compositional fallacies. Such compositional fallacies may lead to a deficient understanding of both the whole as well as its parts and typically arise from a wrong treatment of aggregation and/or a wrong treatment of aggregates. This section provides illustrations of four cases of compositional fallacies and their conceptual sources, to develop a better understanding of the problems usually associated with the micro–macro link in the social sciences (see also Table 1 as well as Kapeller 2015).

A first typical error related to aggregation – the ‘simplistic fallacy’– arises from ignoring the role of relations across individuals. Aggregates contain not only individual entities but also a corresponding set of relations, which tie their individual entities together and create a certain structure. Many classic arguments in economics recognize the underlying complexity, as in Adam Smith’s classic account on the pin-factory, where (individual) specialization can only raise productivity because workers and work-steps are related to each through a particular institutional structure. Without such a specific relational setup, Smith’s pin-factory would hardly be productive at all as further specialization would make it increasingly difficult to arrive at suitable outputs. Similarly, conceiving financial markets as solely driven by objective fundamentals (Fama 1970) necessarily overlooks the complexity of actors recursively forming expectations about each other’s behavior (Keynes 1936). Taking such relations into account seems crucial for understanding financial markets as aggregate entities, however.

In general, most mainstream economic models ignore relational setups and determine aggregate behavior by summing up or averaging across individual entities. The resulting ‘simplistic fallacy’ is based on a deficient understanding of aggregation, which views the ‘whole’ as no different from the ‘sum of its parts.’ Such a view conflicts with two basic observations. First, aggregates may develop (global) properties that no individual part possesses, such as a firm’s

success. Second, individuals may acquire certain (relational) properties precisely because they are part of some whole, like a country's citizen. In both cases we find that 'more is different' (Anderson 1972), as these newly acquired attributes may be conceived as 'emergent properties,' meaning novel features that arise because an aggregate is constituted. For the case of families such novel properties include the possibilities of raising offspring, lending mutual support, creating collective identities and a shared organization of common rights and duties.

However, such a shared familial organization may leave some family members in a dependent and potentially deprived situation, which allows for illustrating a second potential source of error: the 'static fallacy'. It asserts that aggregate properties can always be reduced to lower-level entities, thereby underestimating the dynamics and complexity of social interactions.<sup>1</sup> Hence, the static fallacy abstracts from the contestedness of such arrangements and fosters the impression that the division of labor within a household is simply a matter of individual characteristics, like productivity and preference. Opposition to this static fallacy is a central concern in feminist economics, where the underlying relational structure among individual household members is taken more seriously. These relational setups, in conjunction with cultural and political variables, allow for explaining the often-detrimental position of women (Drèze & Sen 1989). In contrast, such aspects will automatically be neglected if households with multiple members are represented by a single utility function. In analogy with this example, thinking in terms of the static fallacy will attribute aggregate outcomes, like unemployment, poverty or inequality, to certain individual characteristics – like laziness, lacking education and effort or, relatedly, deviations in productivity between low-skilled workers and economic 'superstars' (Rosen 1981) – and will only seldomly take into account relational feedback or structural factors, like existing power asymmetries or persistent stereotypes. Hence, the resulting methodological individualism introduces a normative bias and aggravates the understanding of structural inequalities, exploitation, and domination (see also Kvangraven & Kesar 2023).

This final remark on the lack of consideration of structural factors can also be observed in the context of the 'hierarchical fallacy', which asserts that causality across different levels only runs from individual elements to aggregate properties ('bottom-up'), because wholes can never take

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<sup>1</sup> The proposition that any aggregate property can be reduced is objectionable on two levels. First, such an undertaking is often principally infeasible, because the relevant initial data is never completely known and the associated set of calculations lack a determinable solution. For some specific higher-level phenomena, like human consciousness (Chalmers 2006) or conscious agents in general (Popper 1979: 292), a direct mechanistic relationships with lower-level activities is often denied. Second, one could argue that such an undertaking is impractical since issues become too complicated given the limitation of our current empirical and theoretical knowledge (see Simon 1962).

an explanatory role in this view. Current mainstream economics follows such a routine by imposing a general “hierarchical stipulation that macro-theories require a microeconomic foundation to obtain full validity” (Rothschild 1988: 14). By contrast, heterodox economists of different persuasions advocate for a multi-level approach to economic theorizing (for example, Dopfer *et al.* 2004; Lee 2011; King 2012), emphasizing the changing conditions and constraints for economic action on different levels and the mutual co-existence of top-down and bottom-up mechanisms.

Another reason why a ‘hierarchical stipulation’ creates more problems than it solves is that emergent properties also feedback on their constituents, which cannot be assessed within a unidirectional framework. Consider, for example, innovation in market environments and the associated forces of ‘creative destruction’ (Schumpeter 1942) and ‘path-dependency’ (David 1985) or the continuous evolution of social routines (Hodgson & Knudsen 2004), heuristics (Arthur 1994) and consumer preferences (Witt 2001). In these contexts, we observe a coevolution between individual agency and socio-economic structures, which is manifold and complex. In such a context the epistemological presupposition of a ‘hierarchical stipulation’ of micro over macro gives rise to the ‘dogmatic fallacy’, i.e. the claim that aggregate properties *should* always be reduced to (current) micro-knowledge, while higher-level mechanisms are mere residuals of individual behavior and therefore negligible. The ‘dogmatic fallacy’ is, hence, complementary to the ‘static fallacy’ as the latter assures the possibility of what is demanded by the former. Both fallacies prove especially inadequate in the face of complex systems – be they social systems, like economies, or natural systems, like containers filled with gas – where micro-behaviours can lead to macro-patterns in non-trivial ways, e.g. very complex micro-behavior to stable regularities on the macro-level or rather simple micro-behavior leading to chaotic or unpredictable macro patterns (Farmer 2013, Shaikh 2016). In such contexts, relevant top-down relationships are not only easier to identify by a more holistic approach, they are also often relevant to do not overly discount the influence of structural or contextual factors (sometimes framed as a ‘macroeconomic foundation’ for microeconomics; for example, King 2012).

One natural example of a heterodox research strategy following this tradition is stock-flow consistent macroeconomics (Godley & Lavoie 2007). Here, one starts with accounting identities and stylized assumptions about aggregate behavior to study macroeconomic dynamics, rather than starting with speculative assumptions about the behavior of a ‘representative household’ (see Kirman 1992), as it is common in dynamic stochastic general equilibrium models. Similarly, much of modern ecological economics would start from the

assumption of planetary boundaries as a conceptual cornerstone (Rockström et al. 2009). In this context such ‘macro-founded’ approaches provide important complementary perspectives on macroeconomic dynamics, that allow for the explicit incorporation of microeconomic aspects in a second step. An example is given by in so-called ‘agent-based stock-flow consistent models,’ which study the economy as a complex system with both, bottom-up and top-down effects (for example, Caiani *et al.* 2016).

Table 1: *Compositional fallacies – an overview.*

|                                 | <b>Main error</b>  | <b>Fallacious routine</b>                      | <b>Underlying misconception</b>   |
|---------------------------------|--|--|---|
| <b>The simplistic fallacy</b>   | Ignoring relations, i.e. underestimating the complexity of aggregation       | Simply summing up individual properties        | Wrong treatment of aggregation: <i>"the whole is nothing more than the sum of its parts."</i> |
| <b>The static fallacy</b>       | Ignoring the possibility of unexplainable novelties / irreducible properties | Any aggregate property can be reduced          |   |
| <b>The dogmatic fallacy</b>     | Ignoring that higher-level mechanisms can be studied on their own            | Always aim at providing bottom-up explanations | Treatment of aggregates: <i>"wholes cannot be explanatory—they do not carry mechanisms."</i>  |
| <b>The hierarchical fallacy</b> | Ignoring the possibility of downward causation                               | Never provide top-down explanations            |   |

## **A heterodox perspective on the micro–macro link: why the whole is more than the sum of its parts**

One overarching theme in heterodox economic theorizing is that the consideration of social wholes is important for understanding socio-economic processes and outcomes. This view implies that wholes are more than a mere sum of their parts, since they exhibit non-trivial properties and carry effects of various sorts which cannot be learned from looking solely to their constituent parts. However, this idea has also been subject to different interpretations and applications within heterodox economics, leading to a series of distinct vantage points on the

role of aggregates and aggregation. Some scholars focus on the explanatory capacities of top-down mechanisms, while others try to escape the simplistic fallacy by building particularly sophisticated micro-founded models. They are united in treating the micro–macro link as a complex relationship that deserves explicit attention, because social and economic aggregates may constitute novel objects or, at least, come with novel features, which may have specific real world consequences. We now turn to four fundamental perspectives that have played a decisive role in heterodox treatments of the micro–macro link.

### *Context matters*

One main implication of the idea that wholes do make a difference is to consider the spatial and temporal variance of social configurations to identify distinct realms of economic activity. Such distinctions may refer to historical differences (for example, ‘medieval feudalism’ versus ‘twentieth century welfare state capitalism’), spatial variations (as in ‘core’ and ‘periphery’) or distinct spheres of economic activities (for example, ‘competitive firms’ versus ‘subsistence-oriented householding’). These distinctions are deemed important since the course and effects of economic activities depend on their social and historical circumstances.

Such differentiations are often found in classical political economy. Consider, for instance, John Stuart Mill’s distinction between the sphere of production and the sphere of distribution: while the former is constrained by nature, the latter is solely shaped by human institutions (Mill 1848: II.1.1–2). Consequently, different laws and assumptions apply in these contexts.

In Mill’s account, humankind is clearly subject to ‘macro-foundations’ in the form of environmental, historical, and societal forces, as they largely define the constraints and modes of economic activity. Similarly, many heterodox economists argue that holistic factors, like prevailing culture or institutions, are important for explaining social phenomena and allow for top-down effects or downward causation within their economic theorizing. In a bold and overarching interpretation, this view may extend to the claim that social and economic conditions completely determine actions, fate, and feelings of individuals. Such a view of socio-economic determinism is often associated with Marx’s concept of ‘historical materialism,’ although such an interpretation does not do justice to the original Marxian account. In contrast, the heterodox approach can be more accurately described in analogy to that of a physicist studying the behavior of a single element or system (for example, the behavior of a comet entering the solar system or the pressure in some gas-container in a lab) by taking full account of the relevant environmental conditions (for example, the composition of the solar system or the temperature outside the container; Andersen *et al.* 2000). This more modest attitude is key



to understanding a variety of heterodox ideas, from ecological economists' emphasis on absolute constraints (Georgescu-Roegen 1971) to Keynes' definition of economics as "the art of choosing models which are relevant to the contemporary world" (Keynes ([1938] 1973: 296).

### ***Relations matter***

A second application of the general idea that social wholes make a difference focuses on the interrelatedness of individuals and the related idea of social embeddedness. Attention is devoted to the relations between individuals, and the corresponding impact of other people's attitudes and behavior on an individual's economic thought and action.

Interactions among agents as well as between structure and agency are of prime interest to heterodox economists in several respects. For one, the core conceptualization of an economy as a circular flow, where one person's expenditure adds to another person's income, is directly built on a relational perspective. This circular flow views monetary transactions as fundamental interactions, which constitute mutual interdependencies among single economic actors. The consequences of these interdependencies are a major theme in heterodox economics.

A second aspect concerns the question how relational setups impact behavior on the micro- and meso-level, for instance, regarding preference formation in the context of social emulation (following Marx or Veblen), the emergence of routines in organizations (Nelson & Winter 1982), questions of social identity or the evolution of cooperation (Bowles & Gintis 2011). By taking relations seriously, such a perspective allows for agents of different influence and power as it supports theorizing that incorporates self-reinforcing effects and cumulative advantage (Myrdal 1957, Merton 1968) to address related phenomena, like path-dependency (David 1985; Arthur 1989), wealth concentration, power structures, and elites (Rothschild 1971).

This focus on the role of relations avoids the simplistic fallacy by understanding social wholes as constituted by a set of individual entities and their corresponding relational setup. Social relations play a twofold role. First, they serve as a transmission belt for cultural norms, institutional conventions, established hierarchies, shared goals, and aspirations within a social whole. Second, relations serve as a means for understanding how individual actions might influence social wholes and, hence, provide a lens for assessing social change and novelty. In this perspective, a relational view allows for conceptualizing both, individual agency *and* social structure.

The role of social relations as a transmission belt for social norms and cultural conventions features prominently in heterodox economic thought and can be traced back to Karl Marx and Friedrich Engels ([1845] 2004: 122), who speak of individuals as an “ensemble of the social relations”; Thorstein Veblen (1899), who emphasized the social formation of consumer preferences; or Karl Polanyi (1944), who coined the term ‘embeddedness’ to highlight how individual economic action is always embedded in a certain socio-historical context. From a dynamic perspective this view can also be used to analyze questions of social mobility, where relational structures serve as a means for preserving social hierarchies as in Bowles & Gintis (1975) or Bourdieu (1998), who studied the role of educational systems for stratification in the US and France.

Similarly, active agents that influence aggregate properties also take on a prominent role in heterodox thinking as exemplified by conceptions such as Schumpeter’s entrepreneur (1934) and Keynes’ animal spirits (1936). Both approaches emphasize that individual decisions can be of great impact for future developments. Moreover, active agency plays an important role in heterodox approaches to economic cooperation and trust, path creation and path dependence, and institutional design (for example, Hirschmann 1970).

This dual character of social relations allows for top-down as well as bottom-up effects and thereby captures the fact that individual agents and social structure are mutually interdependent. This point has been forcefully explicated by Mark Granovetter (1985), who refined the concept of embeddedness. Granovetter distinguished between over-socialized and under-socialized conceptions of individuals, attributing the latter to neoclassical and new institutional economics, while the former can be found in holistic approaches to social and economic analysis. Interestingly, in both conceptions individuals are conceptualized atomistic and devoid of any relational embedding: for the over-socialized individuals, any action is determined by social forces as a whole and, hence, independent of any specific relational setup. Under-socialized individuals do not have any significant relations to others. Granovetter (1985: 487) sees the embeddedness perspective as a conceptual alternative, where all “attempts at purposive actions are [...] embedded in concrete, ongoing systems of social relations”.

In this view, issues of trust and sympathy affect all interpersonal coordination, even those constituted as supposedly ‘pure’ economic relations of exchange, which, again, points to the pervasiveness of social embeddedness as a recurring motive. A classic example is given by inter-firm relationships in the high-tech sector, where clusters of coordination and cooperation are particularly common. These clusters are characterized by regular interactions among the involved suppliers, developers, and customers, which lead to a quasi-integration throughout the

supply chain, although single steps in this chain are carried out by formally independent organizations. The longer such relations exist, the more do they ‘outgrow’ the market and become insensitive to market signals such as prices (Elsner *et al.* 2015). However, as stressed by Granovetter (1985) social embeddedness and related networks of social relations are not only a source of trust, stability, and cooperation, but can also lead to exploitation, disorder, and conflict. Hence, Granovetter’s approach does not allow for general predictions aside from the claim that ‘networks matter’, since outcomes will often depend on the overall network structure and the socio-economic environment.

In most mainstream economic accounts such structural properties largely remain implicit as most standard economic models do not account for networks explicitly. However, taking general equilibrium models as an example, we find the implicit assumption of a bipartite star network, as illustrated in Figure 10.1(a). As agents are not directly related to each other in this setup, but rather are connected indirectly via a central auctioneer. Only the latter has direct relationships with all agents and, hence, resides in the network’s center. A change of the network structure has non-trivial effects. An otherwise identical model economy characterized by a ring network, depicted in Figure 10.1(b), exhibits very different distributional characteristics and price patterns (Albin & Foley 1992).

Real networks are, of course, neither rings nor stars. Network analysis has made impressive progress since the 1990s and found that many empirical networks look in some ways similar to Figure 10.1(c). There are few ‘giants’, i.e., nodes with many connections, and many ‘dwarfs’, that have only few connections, which bears some resemblance to power law characteristics often found in economic variables, like individual wealth or firm size (Farmer & Geanakoplos 2008). The economic implications of this structure is an important avenue for future research.

### ***Complex dynamics, emergent properties and real novelty***

Another aspect of a heterodox perspective on the micro–macro link, which is strongly intertwined with incorporating relations into social and economic analysis, is the notion that novel objects or properties constantly arise in the course of social interaction. Sometimes, such emergent properties are understood as foundational to sociality as in Adam Smith’s conception of moral sentiments (1759), where specific moral understanding evolve from the repeated interaction of individuals with certain moral attributes (like sympathy). This setup, in turn, provides the institutional framework in which the wealth of nations is created. More often, it is emphasized that emergent patterns can be stable and reoccurring, which provides a first basis for developing theoretical considerations. An example is given by the beforementioned

emergent pattern that core outcome variables, like income, wealth, firm size or the geographical distribution of assets, repeatedly follow a power law distribution in their upper segment. This pattern can be considered as a stable emergent characteristic of societies with the institution of private property playing a central role. Similarly, the idea that demand is an inverse function of price (i.e. the ‘law of demand’) is considered as a stable emergent property, which can be aligned with a great variety of different assumption of the microeconomic foundations for individual behavior. Aiming to recognize and identify such patterns is, again, similar to the approach of a physicist assessing which reoccurring empirical properties (for example, in terms of temperature or pressure) are characteristic for a given class of systems (Farmer 2013, Shaikh 2016).

Finally, emergent properties are emphasized, because economic systems regularly produce ‘real novelty’, i.e. novel features that are not predictable from past data. The emergence of novelty can be most intuitively illustrated for the case of innovation, which was a key element in the work of Joseph Schumpeter ([1934] 2011: 66).

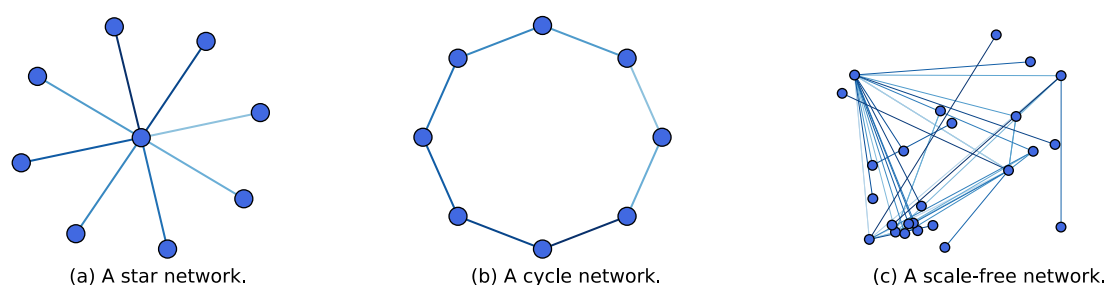


Figure 10.1 Three different social networks

*Notes:* (a) represents the theoretical Arrow–Debreu Economy with the Walrasian auctioneer in the center; (b) is a ring, capturing dense neighbourhood structures; (c) shows a scale free network. *Source:* Author’s own illustration.

Innovations may represent or bring forth novelties that were not existent in an economic system before, and that may carry new mechanisms that fundamentally change the functioning of the economic system as a whole. For example, the advent of contemporary globalization not only came with cheaper import goods, but also introduced a new mechanism – the race for national competitiveness – which puts different countries in a competition for serving the interests of powerful transnational corporations. Similarly, the invention of computers and digital means of communication led to new markets, new goods, and new lifestyles, which continue to influence our society in various ways. While innovations are often a creative recombination of existing ideas, neither the exact way of recombination nor its consequences for society are a priori predictable.

Applied work focusing on such emergent patterns often builds on a refined conception of ‘meso’ in economic analysis (Dopfer *et al.* 2004; Elsner & Schwardt 2014). In the framework of Dopfer *et al.* 2004, for instance, economic agents represent the micro level of the economy and are heterogeneous as they carry different rules. A rule and all its actualizations constitute a meso unit, where the interaction of individuals impacts on the evolution of rules, which is then understood as a main driver of economic change on the macro level. For example, if creditors and debtors mutually adapt their crediting and borrowing behavior to each other, increased risk taking on the side of creditors actualizes the meso-level rule, which could induce increased borrowing by debtors leading to potentially unsustainable levels of debt. Hence, we can reach the classic Minskyan result that stability breeds instability (Minsky 1986) by employing a simple model of rule convergence on credit markets.

The obvious advantage of such an analytical framework is that it facilitates a focus on economic change and thus improves our understanding of the impact of real novelty in economic contexts. The probably most prominent example of an approach that allows for illuminating the impact of novelty, is the theory of path dependence, originating from the seminal papers on technological lock-in by David (1985) and Arthur (1989). Specifically, the further theory of path dependence allows for assessing the potential consequences of novelty under different conditions: it can shed light on cases where the advent of novelty is inconsequential (as in the case of a lock-in), but also rationalize cases, in which novelty leads to more fundamental paradigmatic or social change.

A key for understanding this broad range of possible outcomes is that path dependence theory aims to disentangle path-dependent processes into three different phases (Sydow *et al.* 2009; Dobusch & Kapeller 2013), where the first phase, path creation, characterizes a situation of contingency. Events happening at this stage are usually “outside the ex-ante knowledge of the observer” (Arthur 1989: 118). They are nevertheless important because these events characterize the initial conditions for the second phase, where positive feedback effects kick in and subsequently leads to the dominance of one or a few particular standard(s). The positive feedback may stem from different forms of positive feedback effects based on increasing returns, network effects, preferential attachment, learning and coordination effects, complementarity, or the convergence of expectations. Hence, these processes of positive feedback are in many cases driven by relational dynamics, which contribute to stability and change as a core emergent property. The last phase, the resulting lock-in, reflects the resilience of the dominating standard against change. Thus, while it is almost impossible to predict the

diffusion process *ex ante*, it becomes possible to identify the dominant technology after one has entered the second phase of the path-dependent process.

Hence, path dependency theory focuses on the mechanisms underlying the introduction of novelties and the creation and persistence of social standards of different forms, including social norms, organizational rules, business practices, and technological requirements. It thereby provides a theoretical rationale for the emergence of novelties and explicates the difficulties in predicting whether such novelties will eventually become relevant or even dominant.

These arguments imply that *ex ante* predictions are often difficult or impossible, since the emergence and effects of novelties can hardly be fully anticipated. Nevertheless, the relevant trajectory can of course be explained *ex post*, as we can trace how a specific successful innovation diffused into society and how it affects their members.

### ***Aggregation, welfare and politics***

Finally, our fourth perspective on social wholes and their role in economic theorizing relates to the normative question of economic welfare in the context of aggregation. Mandeville ([1714] 1962) advanced the view that ‘private vice’ in the form of egocentric instrumental rationality leads to ‘public benefits,’ that is, the maximization of social welfare. This view is deeply inscribed in modern mainstream economics, especially in the two fundamental welfare theorems, and amounts to the implicit assumptions that all relevant socio-economic systems follow this basic tendency.

While many heterodox economists could surely accept that the Mandeville case is a *possible* state of affairs, they also tend to critically examine the necessary conditions for such a result. Classical examples in this context include rationality traps – for example, if I can improve my view in the theater by standing up, will there also be a collective improvement if everyone follows this rationale? – and the ‘tragedy of the commons’ which describes the unsustainable usage a public good in the absence of a suitable mode of social coordination (Ostrom 1990). More formally, such cases can be expressed in the form of a prisoner’s dilemma, which illustrates the core property of rationality traps and tragedies of the commons, namely that myopic individually rational actions will lead to the worst possible aggregate outcome. This relationship is the main reason why some heterodox economists consider a prisoner’s dilemma as one archetype for heterodox economic modeling (Elsner *et al.* 2015). Since the welfare aspects of social organization are a general *topos* of heterodox economic theorizing, we find variants of this argument in several heterodox traditions: in Post-Keynesian accounts of the ‘paradox of thrift’; in ecological economists’ emphasis on collective good problems (such as climate

change); in Marxian perspectives on power and conflict; and in evolutionary and institutional economists' focus on the role of social norms, conventions, and law in resolving social dilemmas.

Aside from these grand question on the properties of the 'good society', ontological convictions also carry strong implications for economic policy questions as they influence our perception of relevant causalities and, in turn, our understanding of possible levers of change. In this sense, unemployment might be considered a structural feature of capitalist economies from a holistic perspective, whereas a purely microeconomic focus on unemployment would emphasize individual factors that contribute positively or negatively to a person's employability. Similarly, evidence from many randomized controlled trials is interpreted as indication that individuals need to adapt their behavioral patterns – typically rendering the latter more 'rational' – while structural reforms, for example, changes in regulations or government policy, are often bracketed out in such approaches by assumption. This latter aspect has been called “unwittingly” by established behavioral scientists, who emphasize that structural reforms are often far more effective when it comes to addressing social problems than appeals to individual agency (Chater & Loewenstein 2023).

## **Systemism as a general framework**

### ***Systemism and heterodoxy***

While the label 'systemism' might seem new, the practice of systemism is far from something novel. Here we introduce systemism as a well-developed philosophical concept, which encompasses the basic heterodox arguments on the micro–macro link in economics. The development of systemism owes much to the works of Mario Bunge, philosopher and polymath, who aimed to transgress the traditional dichotomy between individualism and holism, which he perceived as an outdated hindrance to social research and epistemological debate.

Bunge cites a variety of examples for what he conceives as a 'systemist' social research, and the abundance of heterodox economists referred to indicates that the connection between systemism and heterodox economics indeed goes both ways. Among others, Bunge mentions John Maynard Keynes and Wassily Leontief (Bunge 2004: 187), Max Weber, Joseph A. Schumpeter, Thorstein B. Veblen, or K. William Kapp (Bunge 1999: 92–93). More recent examples of heterodox approaches compatible with a systemist perspective include understanding

economics as the study of the social provisioning process (Jo 2011), evolutionary economists' focus on the meso level of economic activity (Dopfer *et al.* 2004), complexity scientists' focus on 'complex adaptive systems' (Simon 1962) or feminist scholars' concept of gender regimes (Walby 2016). In sum, these observations suggest that heterodox economic approaches are salient candidates for illustrating a systemist approach to social and economic issues and, conversely, systemism serves as a natural candidate for substantiating established practices in heterodox economic research from an epistemological viewpoint.

### ***Systemism: key ideas and concepts***

Systemism is built upon the fundamental twin concept of systems and mechanisms, where the latter are situated within or between the former. Thereby any object or entity in systemist analysis is considered either as a system itself or as a component of a system (Bunge 1996).

A system is composed by a set of components (its *composition*) with a particular relational setup (a system's *structure* or *organization*) situated within a certain *environment*. The interrelatedness of agents not only contributes to the constitution of a specific system, but gives rise to a variety of 'ontological novelties': that is, some features that the whole possesses, but its components lack (*global properties*, like a nation's culture or a firm's success); or some features that components acquire precisely because they are part of some system (*relational properties*, like being a creditor, a wife, or an employee; see Bunge 1996). The concept of a system can therefore be applied on several levels. For example, a family is a system consisting of different members with particular relations to each other; at the same time, it is part of a community system within which it has several relations to other components of the community. The resulting levels take the form of a hierarchy of sub- and super-systems, which serve as a basic ontological framework. Such a hierarchical understanding of reality has been suggested by several heterodox approaches, most notably by Herbert Simon (1962).

The second fundamental aspect in systemism is a focus on *mechanisms*, meaning law-like relationships, and the attempt to provide mechanism-based explanations of social phenomena (Bunge 1997). Mechanisms work within or across social systems and lead to continuous changes and stabilization of a given system. This is why we conceive of them "as a process (or sequence of states) in a concrete system, natural or social," (Bunge 2004: 186). Thereby three rough types of mechanisms can be distinguished. First, within-level mechanisms operate within social systems, but address only one ontological layer; for example, a reduction in hourly income may induce a household to increase working hours. Second, bridging mechanisms also work within a certain social system but can take the form of agency-structure relations (a



bottom-up mechanism or upward causation) or structure-agency relations (top-down mechanisms or downward causation). The former provide a theoretical alternative for the aggregation of individual behavior, going beyond a mere ‘summing up’ of individual properties by employing theoretical mechanisms for means of aggregation. Examples of such ‘bridging mechanisms’ are bandwagon effects, where final outcomes depend on the sequence of individual moves; positive feedback effects, which may lead to path-dependent properties of social systems; or the mutual dependency of outcomes, where individual behavior conforms to or is constrained by the behavior of others as in the case of rationality traps. Finally, there are mechanisms operating between a system and its environment (overlapping and surrounding systems), such as the imitation of technologies or competition among firms. One example of a truly systemist heterodox approach integrating all these relevant processes is given by agent-based stock-flow consistent models, which aim to transcend both purely individualist and holist approaches (Caiani et al. 2016).

Note that systemism is not a theory, but rather an ontological and epistemological heuristic, like “a viewpoint, or a strategy for designing research projects whose aim is to discover some of the features of systems of a particular kind” (Bunge 2004: 191). Considering this fact and the fundamental aspects of systemist models, we suggest that systemism is a well-suited philosophical framework to structure heterodox theorizing on the micro–macro link as outlined above. Based on these considerations, the next section explores the relation between heterodox economic arguments and the systemic framework.

### ***Heterodox economics in a systemist framework***

Bunge’s concept of systemism does not only provide a suitable philosophical framework for heterodox theorizing on the micro–macro link, but also offers an intuitive way to express and conceptualize theoretical considerations on micro–macro interactions. The following examples illustrate this aspect from a practical perspective.

The first illustration is provided by Bowles & Park (2005), who use the Veblenian concept of social emulation to explain the allegedly counterintuitive relationship between rising inequality and increasing working hours (Figure 10.2). Due to social emulation of preferences, a higher level of income inequality induces an increase in consumption aspirations across households. To live up to these aspirations, a (sizable) subset of these households may increase their working effort, which leads to an increase of average working hours. A possible extension of this argument is that this increase in the supply of labor

reduces the bargaining power of workers, leading to lower wages and further increasing income inequality, resulting in a path-dependent downward spiral.

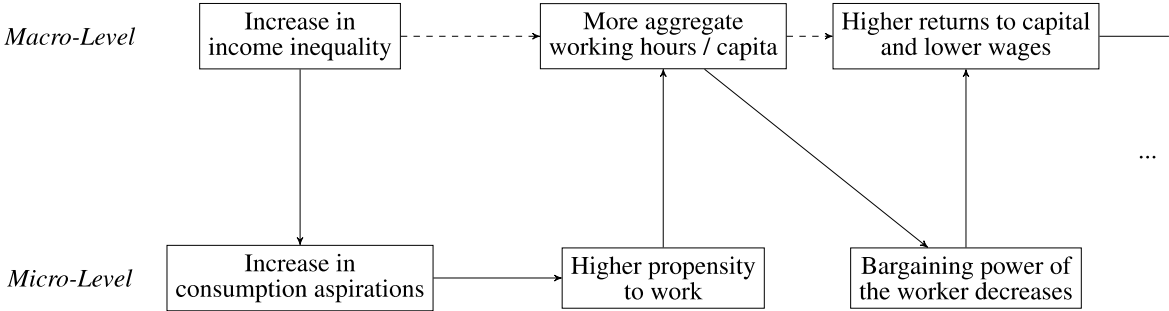


Figure 10.2 Income inequality, labor supply, and economic development in a systemist framework drawing on Bowles & Park (2005). *Source:* Author’s own illustration, based on Bowles & Park (2005).

Our second illustration considers the emergence and evolution of social conventions. Hodgson & Knudsen (2004) discuss an agent-based model where drivers are forced to decide whether to drive on the left or on the right side of a street. They study the conditions required to guarantee the emergence of a stable convention. While their major finding is that habit-formation is a probable vantage point for the emergence of conventions, the illustration in Figure 10.3 extends the underlying argument by illustrating the emergence of conventions in a systemist framework considering both bottom-up and top-down effects.

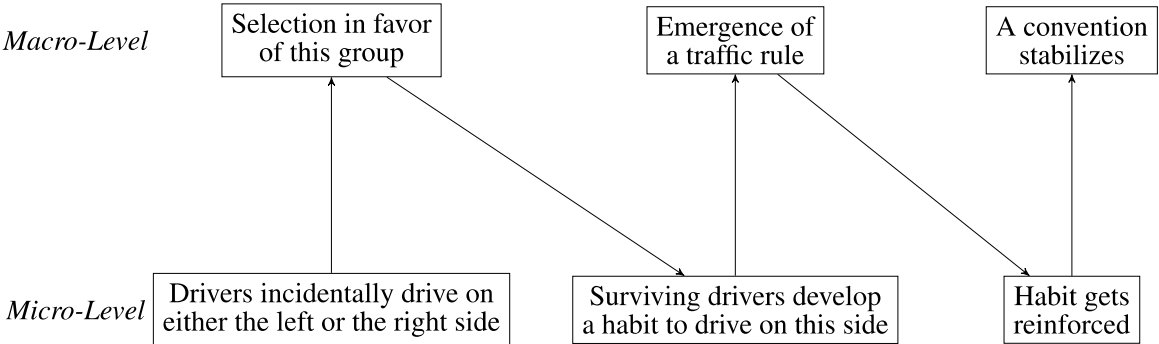


Figure 10.3 The evolution of a traffic convention based on Hodgson & Knudsen (2004) in a systemist framework. *Source:* Author’s own illustration, based on Hodgson & Knudsen (2004).

These examples show that Bunge’s concept of systemism is far away from a methodological straight-jacket. On the contrary, the schematic approach utilized in these examples aims at illustrating how this approach can be employed to facilitate conceptual thinking and the crafting

of ontologically sensible theoretical frameworks on the basis of a solid epistemological foundation. It further provides a useful meta-language that enables the effective comparison of different approaches towards the micro–macro link in heterodox economics and to exploit the potential complementarities among these different approaches (see also Dobusch & Kapeller 2012 and Gräbner & Strunk 2020).

## **Conclusion**

The complex relationship between different ontological levels has received considerable attention in heterodox theorizing. This has led to many important independent contributions on the role of aggregates and the issue of aggregation in social research, which often allow heterodox economists to mostly circumvent typical fallacies of aggregation identified in the second section of this chapter. Instead, we demonstrate in the second section that there exist shared pillars of understanding across different heterodox conceptions. Hence, different heterodox views on the micro-macro link are typically compatible and complementary, which is why they can also be subsumed under a common philosophical umbrella labeled ‘systemism.’ This umbrella is a useful device helping to explore the commonalities and differences in various approaches to the micro–macro link in heterodox economics. In many cases such comparisons will facilitate a ‘heterodox convergence,’ as in the case of evolutionary-institutional and social economics (Elsner 2017), while in other cases the relationship may take the form of productive disagreement. Such an endeavor requires a common conceptual denominator for the different approaches enabling mutual communication and comparability. We argue this missing component is exactly what systemism can supply.

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