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Abstract: Opponents of mainstream economics have not yet called attention to the lack of in-depth examination of the general scientific conception of modern economics. However, economic science cannot consistently fulfil the epistemological and ontological requirements of the scientific standards underlying this conception. What can be scientifically recognized as true cannot be answered, neither through the actual ontological structure of the object of observation nor through a methodological demarcation. These limitations necessarily lead to the claim for both a pragmatic and a radical methodological pluralism.

Keywords: pluralism, scientific conception, mainstream economics, methodology.

Introduction

Criticism of economics, starting with Karl Marx and John Maynard Keynes, seems to have continually accompanied economic science. While in Germany at least, these critiques – buttressed by the socio-political changes of the 1970s – led to the establishment of a few heterodox professorial chairs, recent decades have been marked by the increasing dominance of the mainstream and the marginalization of alternative approaches (see e.g. Heise et al. 2017). Nevertheless, the post-autistic movement of French students and young scholars in 2000, as well as the global economic crisis, have given new momentum to the debate on the state of economics as a scientific discipline. At the national level,

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this movement found an institutional footing in Germany's 'Netzwerk für Plurale Ökonomik' and France's 'Pour un Enseignement Pluraliste de l'Economie dans le Supérieur (PEPS-Economie).' But it has also given rise to an international alliance in the form of the 'International Student Initiative for Pluralism.' While challenging the dominance of the neoclassical mainstream, this movement also emphatically calls for theoretical and methodic pluralism as well as the closer integration of interdisciplinary approaches and the modernization of syllabi to incorporate reflexive and epistemological elements into economic teaching (International Student Initiative for Pluralism in Economics 2014; Netzwerk Plurale Ökonomik 2012, 2020).

In this debate on the future of economics, the heterodoxy (as the enduring counterparty to the mainstream) is characterized by two different positions. On the one hand, there is a fundamental rejection of the whole mainstream and a call for a scientific revolution in the spirit of Thomas Kuhn (e.g. Davidson 2004). On the other hand, there is an appeal for a paradigmatic pluralism (e.g. Dobusch, Kapeller 2012; Heise 2018), which explicitly allows the competition between incompatible and incommensurable scientific research programs (Lakatos 1974) or thought styles (Fleck 1979).

Nevertheless, most of these articles, and particularly the student's call for pluralism in economics, lack a more in-depth examination of the general scientific conception of the discipline. The call to pluralize economics, therefore, has remained in a form of vacuum and has been unable to make an effective impact on the intra-disciplinary discourse. Accordingly, some mainstream economists have argued that economics is already pluralistic (e.g. Bachmann 2017; Becker 2017). Following the contention of Gräbner and Strunk (2020) that such an argument depends on the dimension of plurality considered, some form of pluralism can indeed be observed at the theoretical and methodical levels (e.g. Heise 2017). In taking into account the insightful contributions from Samuels (1997), Dow (1997, 2004), Lawson (1997, 2006) and McCloskey (1998, 2001), this article thus aims to expand the conception of pluralism of economics on the methodological and epistemic dimensions.

On this basis, the first section will investigate the scientific conception of economics. Afterwards, four pillars of this scientific conception will be identified with a view to critically examining its limits in general as well as its

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

transferability to the economic observation object. Section three will then discuss the implications of this critique and elaborate both a pragmatic and a radical vision of a methodological pluralism. Finally, the prospects and starting points for such pleas to transform economics from a monistic into a holistic, plural discipline will be realistically evaluated.

The scientific conception of economics

The scientific conception of economics is closely tied to the genesis of economic science in general. In Germany at least, economics was until the first half of the twentieth century still part of the multidisciplinary *Staatwissenschaften*, and the present separation between economics, sociology and political science was simply not conceivable. The emergence of economics can be situated in the aftermath of the so-called ‘*Methodenstreit*’, which dogma-historical studies have characterized in terms of the conflicts between deduction and induction (e.g. Backhaus, Hansen 2000). In contrast to this view, it has been argued that the emergence of a clear distinction between economics as an explanatory science and the other interpretative, value-driven social sciences revolved not around methodic differences but the appropriate scientific conception of the discipline (Heise 2017, 20). The resulting structuring line within the social sciences manifested itself – due to the recommendations of Talcott Parsons (1935) – not just in the analytical distinction between sociology and economics as disciplines, but also in the thematic distinction between economy and society. On this understanding, economics only provides objective knowledge of actual economic processes, functioning as ‘a body of systematized knowledge concerning what is’ (Keynes 1891, 34) without any particular normative judgement.

Where this development is concerned, further important contributions to the scientific conception came in form of the positivism concept of Milton Friedman (e.g. Hausman 1994) and the critical rationalism of Karl Popper (e.g. Kirchgässner 2015). Critical rationalism has played a particularly prominent role in shaping the conception of economics for two main reasons. Firstly, it implies the idea of an objective, recognizable reality, in which regularities can generally be observed. Secondly, from a methodological viewpoint, the theoretical deduction delivers a priori analytic judgments that are

intersubjectively verifiable and consistently derivable, and that can subsequently be empirically falsified by the experienceable reality.

Nevertheless, the scientific reality is characterized better by the attempt to confirm theories than to refute them (e.g. Blaug 1980). This leads to the idea that theories can be applied (e.g. Backhouse, Cherrier 2014). Furthermore, modern economics emphasizes the claim ‘that theories should be testable, that a useful means of testing is to compare the predictions of a theory with the reality’ (Caldwell 1982, 124). Such procedures underline the combination of both the methodological notions of critical rationalism and Friedman’s positivist understanding of economic science, which contends that economics is ‘independent of any particular ethical position or normative judgement’ (Friedman 1953, 4) and should not just explain the economy, but, in addition, make correct predictions about economic phenomena that have not yet been observed. In order to attain these cognitive goals, all aspects of economic reasoning rely on its ‘scientific method’ (see e.g. Mankiw, Taylor 2014, 17), which means that economics is not primarily defined by an uniform object of observation, but indeed, by a common way of thinking characterized by the application of mathematical methods (see e.g. Graupe 2013).

Overall, the self-conception of economics is epistemically applied to mathematics and the natural sciences and rests on four fundamental pillars:

1. It is based on the idea of an explanatory and predictive science.
2. It involves objectivity and value-freedom.
3. It defines itself to a large extent by the employment of their right methodology and scientific methods.
4. It demands a singular truth and general economic laws and rules.

Pillar 1: Explaining and predicting rather than Verstehen

One often raised argument against mainstream economics is that it relies solely on the use of deductive methods. (Kim et al. (2006), along with Backhouse and Cherrier (2017), nonetheless highlighted an empirical or applied turn in the discipline, involving a continuous shift from a theoretically dominated discipline towards an empirically oriented science. This increasing visibility of empirical

methods, however, is almost exclusively linked to standardized methods and statistics. Qualitative approaches, meanwhile, play at the best a subordinate role (see e.g. Kruse, Lenger 2013). Qualitative research consists in the attempt to gain interpretative and meaningful access to a social reality that has been interactively produced and represented in linguistic and non-linguistic symbols. It is therefore not the primary focus of qualitative research to explain social phenomena and verify previously elaborated theory, but rather to initially discover these, so as to reconstruct the objects of investigation in order to discover unknown issues that could not have been anticipated ex-ante.

Such a humanistic understanding of research, which integrates the subject investigated into the scientific analysis, and the related cognitive goal of 'Verstehen' in general, are clearly rejected by economists (see e.g. Bachmann 2017). However, this attitude is problematic insofar as 'Verstehen' plays a crucial role in a holistic research process as a necessary precondition for all other cognitive scientific goals. [1] From a hermeneutic perspective, economics – as a nomologic science – has only a limited previous understanding of this object of observation (see e.g. Habermas 1967).

Generally, the aim of explaining is to reveal cause-effect-relationships, and then to formulate scientific laws and rules. This deductive-nomological approach forms the epistemological fundament of economic theory, which is generally axiomatically formulated. It is essential to note that such an approach does not extend to historically situated individual cases, but only to deterministic, universal statements. These statements therefore explicitly do not include inductive-statistical explanations, since economics sets standards for deductive-logical rigor that cannot be fulfilled by an inductive-statistical research perspective (Davis 2012, 13).

Besides such deterministic explanations, economics, according to Friedman, also strives toward the cognitive goal of predicting. The basis for the forecasting ability of modern economics can be summarized as follows: If a regulatory relationship can be found, then it should be possible to postulate this connection for the past and the future too. Many critics of economics only focus here on the unrealistic assumptions behind mainstream economics (see e.g. Schlefer 2012) and not on the epistemic foundations behind its cognitive goals. This article, on the contrary, seeks to evaluate the preconditions of scientific explanations and

predictions, regardless of the question whether the necessary assumptions are instrumental or realistic. In this context, and in their explanatory and predictive quest, both critical rationalism and positivism stake the claim to acquire 'knowledge that can be considered "objective", that is not based on value judgements, and that therefore constitutes "truth"' (Heise 2017, 21). In proclaiming such generally valid explanations and predictions, economics necessarily rests upon on the three other pillars of its scientific conception, namely: objectivity and value-freedom, the scientific methods and singular truth.

Pillar 2: Objectivity and value-freedom

From the outset, at least some areas of economics were oriented by the claim of the natural sciences to produce objective and value-neutral knowledge. The loss of importance of the historical school in Germany and the old institutionalism in the US has eroded the significance of explicitly interpretative and non-neutral approaches. Modern economics, on the contrary, sees itself as an objective and neutral science; 'it deals with "what is," not with "what ought to be"' (Friedman 1953, 3). A necessary condition of such objectivity is that scientific findings remain intersubjectively true and thus independent of non-epistemic influence, e.g., direct political or financial influence. According to Max Weber, this does not necessarily mean that science is neutral. Indeed, values are methodically inevitable, but not objectively binding. In order to become 'neutral', science therefore needs to declare the dependence of its theoretical assumptions on its normative conditions. On the stricter interpretation of value-freedom, however, all theories are scientifically permitted only as long as they are not associated with a hermeneutically developed, historical pre-understanding (see e.g. Habermas 1967, 17f.).

This underlines the actual difference concerning the essential core of value-freedom. It is not so much the influence of values in general that makes science per se unscientific, but rather the hermeneutic research perspective, in which the researcher – as a social subject – is interpretatively integrated into the research. In the view of economics, such an approach is regarded as a violation of the postulate of value-freedom. The hermeneutic understanding of value-

freedom is nevertheless scientifically justifiable since it just depends on a different cognitive goal and epistemic foundation.

The discussion concerning normativity, however, is not only limited to non-epistemic and hermeneutic influences. The normativity of economics is, in fact, already anchored in its terminology and usage of language in general (see e.g. Myrdal 1990). In the spirit of Reddy (1979), economics can be described as a discipline that considers language exclusively as a medium for information transfer, in order that economic actors can orient themselves by the markets. In an explicit renunciation of this view, discourse-theoretical approaches argue that linguistic categorization, terms, and definitions are not objective and descriptive in nature, but rather the result of a social negotiation process. Furthermore, the use of economic terms such as rational, efficient, and optimal makes language performatively effective. In general the idea behind the concept of performativity is that science does not describe reality; on the contrary, it explicitly (co-)constructs reality, in such a way that economics is directly involved in the fabrication of real economic factuality (see e.g. Callon 1998; Garcia 1986; MacKenzie, Millo 2003).

In accordance with a different epistemic understanding of science that neglects science's non-neutral character, such a social constructivist perspective is not adopted by economics. The weakness of the neutrality argument is perfectly summarized by Söderbaum (2009, 9): '[E]conomics tells us about the relevant actors in the economy (consumers, firms and government); about how to understand markets (supply and demand of commodities and of factors of production); about decision-making (optimization) and efficiency (usually a monetary concept or at best cost-efficiency). This way of understanding economics is clearly not neutral.' Notwithstanding these limitations, mainstream economics mostly negates its contradictions and appeals to the methodical and methodological dimensions in claiming that the right scientific methods can minimize all non-epistemic influence.

Pillar 3: Methods (and methodology)

The importance of its own methods becomes especially clear in every standard textbook of economics (see e.g. Mankiw, Taylor 2014). It is manifest in such

works that economics defines itself significantly by the use of the right scientific methods and not by its object of observation. Due to its strict method-specific rules – compared to the other social sciences – economics is accorded a higher epistemic authority (Ross 2012, 242), such that it conceives itself as the queen of the social sciences.

In this context, economics has been described as a ‘fetishism of the deductive (mathematical) model building method’ (Milonakis 2012, 250) on the basis of ‘the doctrine that all serious economics must take the form of mathematical modelling’ (Lawson 2012, 11). Strictly speaking, the methodical and methodological dimensions overlap in such a description. It is nonetheless necessary to differentiate between the methods on the one hand and the underlying methodology on the other (see e.g. Heise 2017, 27f.). While deduction – as a distinction between truth and error – is located at the methodological level, the techniques employed are situated to the methodical level. Although economics relies not only on deduction, but on a combination of empirical experience (induction) and logical derivation (deduction), induction is on the account of the problem of induction not sufficient to establish objective knowledge.

It is only on the basis of this methodological foundation that methods and techniques can be derived. These include on the one hand formal-deductive techniques such as differential and integral calculus, stochastic methods, game theory and simulations, and on the other quantitative-empirical techniques such as time series, regression and variance analysis and experimental methods (see e.g. Hirte, Thieme 2013, 46f.). This combination of inductive and deductive methods within the broader framework of fallibilistic positivism can be regarded as method pluralism (or at least variety) and simultaneously as method absolutism, since formal-mathematical deduction is conceived as the implicit standard of scientificity (Heise 2017, 32).

To consider methods first of all, the use of formal-mathematical methods is regarded as so constitutive of economics that Hahn (1992) famously claimed ‘to avoid discussions of mathematical economics like a plague’. This crucial issue is, nevertheless, highly problematic in at least due to two main respects: the potential incompleteness of models and the inappropriateness of mathematical methods. Incompleteness means that reality contains objects, characteristics and relations which are not included in the model but are relevant for the given

problem. That does not necessarily imply that models in themselves are incomplete, but rather that a single model is not sufficient to thoroughly explain reality. Although models can be accurate, it is still uncertain how many models can, in this sense, be true and deliver explanations (see e.g. Gadenne 2014). With regards to the explanation of economic or social phenomena, economics always needs to operate with different models, thereby taking into account the incompleteness of a single model from a pluralistic view.

The economic mainstream tends to respond to objections to the actual, limited significance of models [2] with the claim that the models used may be simplistic and incomplete but succeed in delivering clear explanations. Its assurance and clarity are based on the models' mathematical construction, insofar as mathematics can describe certain thoughts more clearly and explicitly (see e.g. Erlei 2015). Economics therefore understands mathematics not just as an expression of neutrality, but also as the requisite basis for guaranteeing accuracy. When mathematics is regarded in this way as the only acceptable language of economics, non-formal and narrative-based approaches come to be excluded from modern economics.

Lawson (2001, 81) rejects this intellectual narrowness, arguing that it is necessary to open up discussion of the background to the discipline's scientific methods. Assuming that mathematics does formulate certain thoughts more clearly and explicitly, then it is required to critically question whether economic and social phenomena can be captured by such certain thoughts. According to Lawson (2006, 493), however, 'mathematical methods are being imposed in situations for which they are largely inappropriate,' which implies that it is not reasonable to use mathematics in all economic and social situations and constellations. The application of mathematics is dependent on the condition that 'the economy' can be identified and is completely analyzable. Otherwise, its utility and superiority are simply not given. [3] There is therefore no substantive reason why new findings should not be gained via narrative approaches (see e.g. Erlei 2015).

In summary, the validity of the application of formal-deductive methods depends on whether the ontological structure of 'the economy' is actually fully analyzable. Furthermore, this ontological condition of reality is also significant for the actual fundament or the fourth pillar of the scientific conception of economics. The call

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

for both a neutral and objective explanation and suitable methods explicitly requires the existence of a singular truth.

Pillar 4: The existence of a singular truth and naturalistic laws

Generally, truth means objective knowledge that can be differentiated from mere scientifically confirmed opinions. In modern economics, therefore, a relationship between logical derivation and empirical evidence has been established. This methodological approach implies the singularity of reality as a cognitive and veristic category according to the 'one world, one truth' principle. Pluralism at the ontological and veristic levels is rejected here, since a plurality of worlds and truths simply does not exist (Mäki 1997, 39). Although Mäki (1997, 40) admits that 'many facets of the world are discovered,' all such characteristics refer only to 'the one and only world'. On this argument, economics as a science is always confronted with one and the same reality, which is thus captured by one explanatory truth.

From the perspective of relativism or constructivism, this 'one world, one truth' principle, is fundamentally questionable. While relativists consider that, even for one world, different culturally and historically specific explanations exist, constructivists adopt an even more radical perspective. They argue that reality itself is always constructed by its observer, at least in its social dimension. Beyond the attribution of meaning, there is no understanding of the world in itself. Knowledge of the world is therefore understood as part of a socially constructed order. Processes of social objectification, for example through sign systems, institutions, language, and material objects, can be considered constitutive for the social realization of reality. Here it should be noted that this does not entail that there are different facets of one reality, but rather that different social realities can exist.

The rejection of ontological and veristic monism stands in sharp contrast to the scientific conception of mainstream economics. To review some basic arguments in the philosophy of science, this confrontation is based on the differentiation between open and closed systems. In such as context, reality can be understood as a system which is comprised of elements (e.g. agents) and their relations or interconnections (such as actions) (Loasby 2003, 283). A system is closed if it has the following characteristics:

- 1) 'all relevant variables can be identified;
- 2) the boundaries of the system can be specified, so that it is clear which variables are exogenous and which are endogenous; these categories are fixed;
- 3) only the specified exogenous variables affect the system, and they do this in a known (or predetermined) way;
- 4) relations between the variables are either knowable or random;
- 5) the components are separable (independent, atomistic) and their nature is constant;
- 6) the structure of the relationships between the components is known (or predetermined)' (Dow 2002, 139f.).

In such a system, a priori analytic judgements are possible, since all of the elements can be clearly described in such a way that the system is fully analyzable and all developments within it are completely deterministic (Heise 2017, 22). At this point, the actual premise of modern economics becomes clear. The deductive-nomological explanatory approach 'relies upon (which seeks or posits) closed systems' (Lawson 2006, 493). Mainstream economics reasoning necessarily takes into account all interactions between different elements in its models, such that complete inter-connectivity is a key component of general equilibrium analysis (Loasby 2003, 291). Potts (2000, 182), indeed, opposes the idea that there is no connection between all of the elements. If this connection were lacking, such a reality could not be described as a closed, but rather as an open system, which exhibits the following characteristics:

- 1) 'It may not be possible to be sure, in a complex system, that all relevant variables have been identified;
- 2) the boundaries of the system are semi-permeable and/or their positions are not perfectly clear and/or may change; this implies that the classification into exogenous and endogenous variables may not be fixed;
- 3) there may be important omitted variables and/or their effects on the system may be uncertain;
- 4) there is imperfect knowledge of the relations between variables; relationships may change, for example owing to human creativity;
- 5) there may be interrelationships between agents and/or these may change (for example agents may learn);

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

6) connections between structures may be imperfectly known and/or may change; structure and agency are typically interdependent' (Dow 2002, 140).

Open systems are characterized by the fact that their elements are not connected, which means that they are neither deterministic nor fully analyzable. Considering the social reality as an open, non-fully analyzable model, there cannot be just one truth but rather a plurality of theoretical representations. 'In other words: the ontological (and veristic) monism underlying the "one world, one truth" principle can only be defended if the object of investigation is understood as a closed system' (Heise 2017, 22).

Truth as the essential core of the scientific conception of economics requires that it is not sufficient just to take reality as a closed system; reality must in fact be such a system. In order to reduce the complexity on the one hand and to increase the explanatory power on the other hand, it is possible to convert open systems (on the basis of certain ontological propositions) into closed systems. However, this implies only one possible representation of reality and not one true explanation of it. Nevertheless, mainstream economics sometimes acts as though the singularity of truth actually exists, without analyzing the ontological fundament of the object of observation in general. [4]

In essence, (neoclassical) mainstream economics relies heavily on two ontological closures within its models in order to maintain the singularity of truth and, on this basis, to formulate economic laws endowed with deterministic regularity [5] and an independence from time, space, and the social context. These are intrinsic closures on the one hand and extrinsic closures on the other (Lawson 1997, 114ff.). The intrinsic closure – described as atomism in Lawson (2006) – involves the assumption of intrinsic constancy and reducibility. Here the inner structure of the object of observation is always constant and all possible results can be traced back to the general system and model conditions. Since economics assumes that 'individuals [are] more or less the only unit of analysis' (Lawson 1997, 116), under the given conditions, the behavior of atomistic individuals always leads to the same results. In addition to this, the extrinsic closure condition or isolationism (Lawson 2006) involves isolating economic models from their surrounding environment so that distorting effects that could act upon them can be fully excluded (Lawson 1997, 115). Without the construction of isolated atoms, 'the desire of pursue deductive inference would be frustrated'

(Lawson 2006, 494), since only in this way can be ensured that the deducible result y always follows x .

Through this procedure it is possible to derive closed causal sequences and economic laws. Nevertheless, the underlying ontological premises do not always correspond to the actual nature of social reality. According to Lawson (2006, 494ff.) some characteristics of social ontology do not accord with the assumption of atomistic, isolated actors. Social phenomena are rather intrinsically dynamic or processual. They are further interconnected and organic as well as being structured by social relations. The social realm is also characterized by emergence and polyvalence. [6] This social ontology offers a counterpoint to the scientific conception of economics. If the ontological structure consists of openness and ambiguity, then deterministic laws can no longer be formulated. The same holds for the use of formal-deductive methods since the assumptions of mathematical methods just do not respond to the social reality as an open system. Rejecting the closed system ontology of mainstream economics and, thus, a single representation of reality, ontological openness needs to imply that a singular truth simply cannot be identified. In general, ontological openness would mean that the actual essence of the foundations of economics is unclear and can be interpreted in different ways.

Leaving this epistemic perspective for a moment and making some necessary, ontological restrictions for the investigation of an approximate (singular) truth, it is the methodological approach to disclose this truth. Modern economics is marked by the use of a combination of deduction and induction within the context of fallibilistic positivism. Even with such a methodology, however, models or theories cannot ultimately be verified; at best induction can only serve to falsify them. There can then be no certain knowledge of an assumed singular truth, but rather at best only conjectural knowledge. In these circumstances, it becomes clear that science cannot reveal the truth, only limit error. In sum, as long as no empirical proof is given to the contrary, any intersubjectively verifiable statement can be regarded as conjectural knowledge. (Heise 2017, 23)

On this argument, fallibilism would seem to be a reliable, scientific procedure to discriminate between competing explanatory approaches to reveal the singularity of truth. This nevertheless only holds true if there is certainty that a theory has really been falsified. Following Pierre Duhem, however, a single isolated theory

can never be empirically tested, since theories are always interlinked with other axioms and hypotheses. A theory is always tested in connection with other background theories or hypotheses, such as measurement or statistical distribution theories. Exactly which statement of a theory has actually been falsified, then, remains inconclusive. Here Quine (1980, 43) argues further that ‘any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system.’ Even if a theory does not fit with the empirical evidence, it is still possible to bring the theory into harmony with empirical observations. ‘By changing certain background hypotheses in the protective belt, it is at least possible to escape an ex post falsification even if an ex ante predictive test has failed’ (Heise 2017, 24). Empirical evidence is thus compatible with different theories, so that the claim of economics concerning a singular truth cannot be fulfilled, even if ontological openness, constructivism, or relativism are rejected and the methodology of fallibilistic positivism is adopted.

In the face of the Duhem-Quine thesis, a reliable method for discriminating between competing theories and proclaiming singular truth simply does not exist. In other words, every economic law is based on an epistemologically shaky foundation. Neither the most famous law of neoclassical economics, according to which prices on the markets are the result of supply and demand, nor the Marxist claim concerning the tendency of the profit rate to fall are then verified scientific knowledge. With regard to the fourth pillar of the scientific conception of economics, it can be noted that laws about or of the economy can always fail, since truth: (1) cannot be epistemically proven through fallibilism (Duhem-Quine thesis), (2) cannot be identified (social ontology) and (3) simply does not exist (constructivism or relativism).

In general, then, the self-conception of economics cannot consistently meet its own high scientific standards. Only the cognitive goal of explaining economic phenomena can be maintained, with the qualification that deterministic laws cannot be formulated with a singular truth claim. Scientific explanations are then generally possible, insofar as competing explanatory approaches may exist, each of which rests on certain ontological propositions and restrictions. What can be scientifically recognized as true (conjectural knowledge), however, cannot be answered, neither through the actual ontological structure of the object of

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observation nor through a methodological demarcation. Instead, truth depends on the social, political, and cultural conditions of the research process.

Implications of the call for pluralism in economics

Methodologically, it has become evident that there is no ultimate method of discriminating between different explanatory approaches. What does this mean for pluralism in economics? Considering the various dimensions of plurality, it is undoubtedly insufficient only to call for pluralism at the theoretical and methodical levels, since method monism is simply not justifiable and theory monism requires the simplicity of social reality so that just one comprehensive model can explain it. The same holds for paradigmatic pluralism, which nevertheless demands closer inspection. At the paradigmatic level, pluralism would mean that economics – in line with critical realism and in form of an explanatory science – would still investigate basic patterns in the economy, with the caveat that the ‘one world, one truth’ principle [7] of a closed and fully analyzable system could not be applied. Furthermore, only conjectural knowledge could be proclaimed. According to Heise (2014), drawing on Imre Lakatos concept of research programs, a paradigm can be described by the following classification dimension: (1) a certain methodology that is scientifically acceptable, (2) a number of core assumptions (axioms) on which the theory is based, (3) an ontological-heuristic fundament that needs to be accepted (Heise 2014, 74).

Where the differentiation between various paradigms is concerned, the decisive role is played by the ontological-heuristic dimension (see e.g. Homann 1988). Given the ontological openness of social reality, certain heuristic prior assumptions necessarily have to be made, which can result in a variety of different pre-analytical visions. In economics, at least three different examples of such analytical vision [8] can be found: (1) Mainstream economics is based on Walras’s law system, which describes reality through symmetrical exchange relations; (2) hierarchical creditor-debtor relations, meanwhile, are the focus of post-Keynesianism; and (3) Marxism’s foundations lie in relations of subordination or power. Paradigmatic pluralism equally includes mainstream approaches and heterodox paradigms. Axiomatic dissenters such as behavioral

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economists or different theoretical approaches such as trade theory and growth theory, indeed, can be recognized only as analytical varieties within the mainstream paradigm. By integrating not just mainstream approaches, but also the heuristic dissenters (i.e., post-Keynesianism and Marxism), economics would, however, become pluralistic at the paradigmatic level by recognizing the ontological structure of social reality.

It would seem that such paradigmatic plurality, in the form of an 'interested pluralism' (Dobusch, Kapeller 2012, 1043), reaches the ontological limits of the scientific conception of economics. Nevertheless, the crucial question is what actually follows from ontological openness for the call for plurality in economics, or, more precisely: It is only paradigmatic pluralism that follows from an open systems ontology, or also methodological pluralism?

Methodological pluralism as the only solution?

Whereas multi-paradigmatic economics accepts the epistemic foundations and methodological borders of modern economics, and only argues for heuristic plurality, a comprehensive critique of the scientific conception of economics would explicitly call for a methodological pluralism. In this understanding, ontological openness means that the reality can methodologically be interpreted in pluralistic manner. According to methodological pluralism it holds that there is no single methodology with which a scientific analysis can be performed, since an open system is not fully analyzable with only one methodology. Dow (1997, 97) therefore argues that 'the recognition of the inevitability of a range of methodologies [...] is the logical outcome of an open-systems epistemology and ontology.' Methodological pluralism necessarily means that the ontological and methodological dimensions are connected.

Methodological pluralism is nonetheless not limited to an open system ontology, but also follows from a closed system, since no single methodology can be considered as superior to another. In this context, it has already been noted that the fallibilistic positivism cannot fulfil the sophisticated claim for singular truth. According to Samuels (1997, 74), all methodologies have their internal and external limits, so that 'we cannot solely rely on any singular methodology.' No methodological position can then be excluded a priori from the research process,

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

which inevitably leads to the existence and legitimacy of different methodological approaches. Since no assured knowledge of reality is available in either a closed or an open system, knowledge is thus always associated with uncertainty. Hence, there is also no basis for deciding which is the right way to generate such knowledge. In this respect, methodological pluralism can be regarded as a general vehicle to increase knowledge (Dow 1997, 96). ‘Variety is seen as producing a more robust basis for knowledge than any single, conclusive methodology’ (Dow 2004, 281). This plea for methodological pluralism can be complemented by drawing attention to the contradiction in the prescientific claim that science knows how knowledge can be achieved before such knowledge is generated. ‘Methodology claims prescience in scientific affairs.’ (McCloskey 1998, 186). The demand for a single methodology is then anything but not scientific since it entails clearly this contradiction. [9]

Pragmatic orientation

From this methodological perspective, two different orientations can be derived. Firstly, pluralism in economics that challenges the superiority of a single methodology but subscribes to the epistemic foundation of modern economics can be described as pragmatic methodological pluralism. [10] Such pragmatic pluralism implies that different methodological orientations can essentially communicate with each other. It is therefore necessary that there is a common ground for scientific discussion with certain identical characteristics (Heise 2020), in the form of a ‘structured pluralism’ (see e.g. Dow 2004) exists. For a methodological pluralism, these characteristics are indispensable in order to prevent methodological anarchy on the one hand and methodological monism on the other. The different epistemological and ontological credentials of each statement therefore need to be identified, so that every scholar can understand what the idea behind the proposed theory actually is. Communication between proponents and opponents of different methodologies – and theories – is based on the comparison of different goals, paradigmatic structures, variables, arguments, and meta-methods. Here it needs to be declared which ontological foundation a certain methodology rests on, and which limitations the methodology exhibits (Samuels 1997, 75ff.).

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

Furthermore, pragmatic methodological pluralism contends ‘that theory can perform several roles, and that different modes of practicing economics do not perform all roles’ (Samuels 1997, 76). These functions include various cognitive goals, such as explaining, describing, and predicting, giving an ontological definition of reality and its epistemic structure, and legitimizing or critiquing the scientific status of economics itself. In these circumstances, methodological pluralism requires that economics incorporate more goals than simply explaining and predicting, and that it reflexively addresses its epistemic and ideological foundations as well as the sociological structures of modern economics. Here it is indeed possible that some functions can better be fulfilled by fallibilistic positivism. Nevertheless, a pragmatic methodological pluralism includes a continuously repetitive discourse about the pros and cons of different methodological approaches.

Radical orientation

Secondly, methodological pluralism, combined with an epistemology other than critical rationalism or realism, would lead to radical methodological pluralism. An epistemic foundation in the form of relativism or constructivism distances itself explicitly from the current orientation of modern economics, since both epistemologies consider that universally valid truth does not exist, and that reality is always constructed only through the process of generating knowledge. When the existence of objective truth is challenged, no procedure for distinguishing between different approaches is needed. Then, a reasonable restriction of such a procedure cannot be justified (Heise 2017, 27f.). Consequently, the epistemic justification of methodological pluralism necessarily implies an epistemic pluralism that recognizes different understandings of reality and how scientific knowledge is then actually constructed (Dow 1997, 96). Such an epistemic foundation is not compatible with modern economics, insofar as it denies the singularity of reality and hence also the ontology of the ‘one world, one truth’ principle.

Radical methodological pluralism can by all means be described as an ‘anything goes’ pluralism. In the spirit of Paul Feyerabend, if knowledge cannot be reduced to clarity, accuracy, objectivity or truth, this makes ‘anything goes’ the only one

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

principle for generating knowledge (Feyerabend 1986, 31f.) On a traditional epistemic understanding, this form of methodological pluralism is interpreted as a non-methodology, since no general rules or standards are established (Dow 1997, 96). To combine these two views, radical methodological pluralism is not oriented toward the demarcation of objective truth, but should rather take a critical, value-driven perspective on social circumstances, while insisting on improving the general standards of living.

Prospects and starting points for methodological pluralism

When the call for methodological pluralism rejects the existence (pragmatic orientation) or even the necessity (radical orientation) of a suitable demarcation process, it violates the current disciplinary boundaries of modern economics. The historical rupture between economics and economic sociology is precisely anchored in this methodological constellation. Furthermore, it is just this rupture that the proponents of pluralism in economics need to address, since interdisciplinarity is the main demand of, for instance, the International Student Initiative for Pluralism. Thus far, methodological approaches that reject fallibilistic positivism as the only accepted and practiced methodology can exclusively be found in neighboring sciences such as sociology and political science. According to methodological pluralism, interdisciplinarity would then lead toward the integration of sociology and economics into something like a social scientific unity (see e.g. Hesse 2010). At the least, this movement would soften the border between the two disciplines. Methodologically, this would also mean implementing alternatives to fallibilistic positivism such as pure empiricism, historicism, or phenomenism, along with *Verstehen* and advocacy as further cognitive goals.

In addition, methodological pluralism means more than just the pluralization of modern economics with respect to the dualistic relation between the orthodoxy (or mainstream) and the heterodoxy. Currently, two approaches to such an undertaking can already be observed in the interdisciplinary field of the social sciences. Firstly, socioeconomics exhibits an explanatory and interpretative approach, employing different methodical and thematic concepts than modern economics. All socioeconomic approaches bring together economy and society on

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

the basis that social processes shape all economic phenomena. Nevertheless, such socioeconomic projects are just beginning to be established, which means that existing programs and approaches need to be classified on the basis of a standard set of methodological components. It is precisely this vacuum that can be fulfilled by a methodological pluralism. In contrast to multi-paradigmatic economics, this would turn economics into to be an interpretive discipline that seeks to analyze historically and institutionally specific situations and phenomena, while obviating the claim for generally objective knowledge (see e.g. Maurer 2015).

Secondly, a similar orientation would involve a methodological opening towards (critical) political economy. In its explicit challenge to the postulated neutrality of mainstream economics, political economy is therefore strongly oriented towards social reform. In clear contrast to many heterodox approaches, the challenge for mainstream economics here is not to produce better economic models with greater explanatory power, but rather to adopt a decidedly political understanding of the economy. In this context, Stilwell (2016, 44) argues: ‘Thus, the unity may come a “world view” of the capitalist economy structured by power relations and prone to inequality and crises. The common ground may also be methodological, emphasizing a shared commitment to analysis of the historically contingent character of economic phenomena rather ‘equilibrium’ conditions. The common ground may also be explicitly political, emphasizing the mission of putting democratic politics in command vis-à-vis market forces.’ In a similar manner to socioeconomics, political economy stands for a significantly broader understanding of the economy, which is embedded in historical, social, and political contexts. Furthermore, political economy can be seen as a form of interdisciplinary merger with sociology, political science, and history. [11] Methodological pluralism would then imply returning economics to its roots as a social science.

Conclusion

Overall, it is rather multi-paradigmatic economics that stands out as the more realistic approach to the pluralization of economics. The reason for this is not the paradigmatic openness of mainstream economics, since the acceptance of

different pre-analytic visions at the heuristic level cannot be expected without external, political, and social influence or pressure. Instead, it is the fact that a claim for methodological pluralism would probably not be supported by the (remaining) proponents of the heterodoxy. Nevertheless, this negative outlook should not be misinterpreted as a farewell to methodological pluralism. On the contrary, it is only such an epistemic and methodological openness that sufficiently addresses the limitations of the scientific conception of economics. Methodological pluralism in both its pragmatic and radical orientations offers the prospect of a substantial critique of the basis of modern economics.

Endnotes

[1] According to Brühl (2017) six cognitive goals of science can be identified: Verstehen (interpretive or participatory examination of social phenomena), description, explanation, prediction, (value-driven) advocacy (e.g. normative intervention), and performing society.

[2] In general, it is difficult to critique modelling in economics since modern economics is hardly conceivable without models. 'If it isn't modelled, it isn't economics, no matter how insightful' (Colander et al. 2004, 492).

[3] In such a situation, mathematics does not produce a higher degree of scientific knowledge. It thus only has a sociological function (Hirte, Thieme 2013) or can be seen as the result of path dependency (Dobusch, Kapeller 2009).

[4] Heise (2017, 22) concludes that 'though it is seldom explicitly acknowledged, this [a closed system] is precisely the premise of neoclassical model of economics.'

[5] '[F]or every economic event or state of affairs y there exists a set of events or conditions x_1, x_2, \dots, x_n such that y and x_1, x_2, \dots, x_n are regularly conjoined under some (set of) formulation(s)' (Lawson 1997, 114).

[6] Lawson (2006) attributes such conditions to the heterodoxy, in contrast to mainstream economics. According to Hirte and Thieme (2013), however, the scientific practice indicates that this openness has not been followed by the heterodoxy. In general, these deductive closures may be the reason, why economists – independently of whether they are orthodox or heterodox – arguing

Reinke Rouven (2021), A critical note on the scientific conception of economics: claiming for a methodological pluralism, The Journal of Philosophical Economics: Reflections on Economic and Social Issues, XIV (1-2), 108-135

either consciously or unconsciously for the neutrality of their models and theories.

[7] The ‘one world, one truth’ hypothesis remains functionally unchanged.

[8] To a certain extent, the ontological-heuristic foundation of a paradigm is also influenced by normative elements. Here the stricter interpretation of value-freedom comes up against its limits, since the basic idea of a heuristic is always characterized by a certain, non-neutral perception of the social reality. Paradigmatic pluralism necessarily means value-freedom in Max Weber’s sense, whereby science must declare the dependence of its theoretical assumptions on its normative conditions.

[9] Methodological pluralism implies a logical contradiction, since ‘the argument for methodological pluralism itself denies any general basis for such an overarching argument’ (Dow 2004, 281). At the same time, methodological monism cannot be scientifically justified. As a result, at the methodological level it is an arbitrary decision whether a monistic or pluralistic approach is preferred.

[10] It should be made clear that the word pragmatic is used here colloquially rather than in the sense of scientific pragmatism.

[11] The call for interdisciplinarity can also be taken up by multi-paradigmatic economics. Even though the disciplinary boundaries between economics and the other social sciences remain unaffected, multi-paradigmatic economics should use its findings in its own research process. This also holds true if these findings are associated with a different epistemic and methodological foundation.

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