

Pluralism in economics: its critiques and their lessons

Claudius Gräbner and Birte Strunk

Third revision (February 13 2019)

Pluralism in economics: its critiques and their lessons^{*}

Claudius Gräbner^{a,b}

Birte Strunk^{b,c}

^a*Institute for the Comprehensive Analysis of the Economy (ICAE), Johannes Kepler University Linz,*

^b*ZOE. Institute for Inclusive and Sustainable Economies, Bonn, Germany.*

^c*Vienna University of Economics and Business (WU)*

February 13 2019

(Third revision)

Abstract

This paper provides a taxonomy and evaluation of four common arguments against pluralism in economics: (1) the claim that economics is already pluralist, (2) the argument that if there was the need for greater plurality, it would emerge on its own, (3) the assertion that pluralism means ‘anything goes’ and is thus unscientific, and (4) the claim that economics must have a single dominant research program to justify its role as a major science. We submit counter-arguments to all four. Based on the assessment of these critiques we identify two main challenges to be faced by advocates of pluralism: first, the need to derive adequate quality criteria for a pluralist economics, and, second, the necessity to propose strategies that ensure the communication across different research programs. The paper concludes with some suggestions to meet these challenges.

^{*} The authors can be reached via email. CG (corresponding author): claudius@claudius-graebner.com;
BS: b.strunk@plurale-oekonomik.de

1. Introduction

The call for pluralism in economics has gained a large number of supporters in the past couple of years (e.g. Dow 2004; Sent 2006; Dobusch and Kapeller 2009; Gräbner 2017), yet it remains contested for various reasons (e.g. Hodgson 2017; Becker 2017; for a discussion of reasons see Flechtner 2018). A majority of the literature on pluralism in economics has been concerned with a justification of pluralism. The direct engagement with criticism has not been of primary importance so far and is, therefore, the main focus of this paper. It contributes to the debate by discussing four frequently articulated arguments against the plea for pluralism. We scrutinize which arguments pose a serious challenge to the pluralism movement, and which steps are necessary to address them. Thereby we offer a new classification of critiques, according to which some of the arguments are criticizing the pluralism *movement*, while others criticize the *concept* as such. While we argue that the critiques posed against the movement are less convincing, the arguments addressing pluralism as a concept highlight challenges that have to be dealt with by pluralists. Specifically, pluralists must advance answers to the questions of (1) how communication among different schools of thought can be effectively realized, and (2) whether and how a quality assessment within a pluralist economics community can be ensured.

It is important to note that while all arguments addressed in this article are present in the current debate, not all of them are new.¹ In fact, those criticisms we consider most convincing are rooted in long-standing debates in the philosophy of science. Likewise, the responses provided here often draw upon a synthesis of previously formulated arguments. Thus, aside from providing a compact engagement with common criticisms of the concept of pluralism, this article tries to move some of the public debate on a more academic level, and to link conventional contentions to more precise arguments made in the philosophy of science. Thereby we – hopefully - contribute to both a rise of transparency and clarity in the debate, as well as to an improvement of the concept of pluralism as such.

¹ Also, arguments against pluralism are not only formulated in academic publications, but regularly posed in personal conversations, blog articles, or social media such as Twitter and Facebook.

To achieve these goals, we proceed as follows: section 2 clarifies the main terms and concepts of the upcoming debate. Section 3 assesses four common critiques of pluralism. A discussion of the ‘lessons learned’ and open challenges follows in section 4. Section 5 concludes.

2. Pre-considerations about pluralism

Debates about pluralism frequently suffer from an ambiguity of terms and concepts (Sent 2006). Thus, to avoid misunderstanding we begin with a clarification of how we understand the basic concepts to be used throughout this paper. In particular, we clarify our use of the term ‘pluralism’, its ‘dimensions’, ‘justifications’ and ‘degrees’, and the term ‘research program’.

First, we follow Mäki (1997) and distinguish between plurality and pluralism. *Plurality* is understood as a descriptive category that reports the multiplicity of an item. *Pluralism* will refer to a prescriptive rather than a descriptive claim: it is a “theory or principle that justifies or legitimizes or prescribes a plurality of items of some sort” (Mäki 1997, 38).

Second, we distinguish between various dimensions of pluralism and plurality. The dimensions of pluralism describe the areas within which a plurality of items could be prescribed or justified. While Mäki provides an extensive (yet non-exhaustive) list, the present contribution will be confined to the dimensions as outlined in table 1.² Note that a person might hold pluralism about methods, but not about realities, and still call herself a pluralist.

Third, the same dimensions allow for categorizing justifications for pluralism. Since pluralism is a normative concept, it requires references to particular reasons for a certain level of plurality. These reasons can be, among others, epistemological, pragmatic, or ethical. We suppose that many misunderstandings in the debate about pluralism stem from the fact that authors are not clear about the dimension of plurality they are arguing for, and which kind of reasons they provide (see also Flechtner 2018).

² Sometimes, these dimensions necessarily overlap, e.g. in the case of methods and theories. Yet we believe they provide for an illustrative distinction that is useful for structuring the debate.

Kind of plurality	Items referenced
Epistemological plurality	Criteria for what counts as a (good) explanation.
Methodological plurality	Methods used for inquiry
Ontological plurality	Assumed properties of reality
Personal plurality	Scholars (in terms of e.g. their gender, race, or political orientation)
Purpose plurality ³	Aims of inquiry, questions and problems considered worthy of inquiry
Theoretical plurality	Theories
Topical plurality	Topics addressed

Table 1: *Dimensions of plurality – a non-exhaustive list.*

Fourth, plurality is not a matter of all-or-nothing. It is a matter of degrees. According to Mäki (1997) theories (and, we would add, methods, values, etc) can be substitutive or complementary towards one another. Toleration (or even endorsement) of rival claims to truth is more demanding than toleration (or endorsement) of complementary claims. Therefore, to endorse a plurality of substitutive items requires a higher degree of pluralism than endorsing a plurality of complementary items (Mäki 1997, 45; for examples see section 3.1). This is not to say that a higher degree of pluralism in all dimension is always better. Maximizing plurality in all dimensions is not considered desirable by the majority of pluralists (Caldwell 1988; Caldwell 1997; Mäki 1997; Marqués and Weisman 2008).

Finally, the Lakatosian term ‘research program’ will be used frequently throughout this article. As in the original, a research program in our use of the term is constituted by its core, which not only includes concrete hypotheses and axioms, but also conventions about the dimensions mentioned above, such as purposes, theories and methods. More specifically, the core of a research program specifies the questions worth investigating as well as the admissible (meta-)theoretical

³ This was originally referred to as ‘pragmatic plurality’ by Mäki, but since we use the term ‘pragmatics’ in another way below we decided to use ‘purpose plurality’ in order to avoid misunderstandings.

assumptions and methods for these investigations. It includes an agreed upon summary of the *pre-analytic Vision* (Schumpeter 2006) of the scientists operating within a given research program.

3. Arguments against pluralism

Four common criticisms of pluralism are discussed in this section: (1) ‘Economics is already pluralist’, (2) ‘If there were a need for pluralism, it would emerge on its own’, (3) ‘Pluralism means *anything goes*, and is thus unscientific’, and (4) ‘A dominant research program in economics is needed, because that is what determines a mature science’.

3.1. *The discipline is already pluralist*

Some argue that economics as a science is already pluralist (e.g. Colander 2000; Colander *et al.* 2004; Davis 2008; Becker 2017; Cedrini and Fontana 2017). While this does not criticize the concept of pluralism as such, for some (e.g. Becker 2017, but not for, e.g., Davis 2008 or Cedrini and Fontana 2017) this means that any critique of pluralists actually addresses a strawman. Newly emerged research areas such as behavioral economics are often presented as examples. Yet, to assess the argument that “economics is already pluralist”, one has to be explicit about the *dimension* and *degree* of plurality (see section 2). While it is true that there are a number of developments within economics that came with an increase of plurality in one dimension, this is not necessarily true for others. Depending on the dimension considered and the desired degree of plurality, the argument that the discipline is already pluralist might be true or false, and so is the conclusion that pluralists are addressing a strawman.

Considering the topical dimension of economics, for example, the claim is most likely true: there is indeed a large plurality of topics dealt with in the current mainstream. However, considering epistemological plurality, the claim is almost surely false. As Colander *et al.* (2004) summarize: “If it isn’t modeled, it isn’t economics” (see also Sugden 2000; Lipsey 2001). Yet, that modeling is certainly not the only strategy to generate knowledge about a system under investigation has been discussed extensively in modern philosophy of science (Weisberg 2007; Frigg and Nguyen 2017). Thus, excluding all non-modeling approaches from economics is certainly incompatible with pluralism in the epistemological dimensions. Although the mainstream therefore does allow for a

certain plurality of topics, it does not do so regarding a plurality of epistemologies. So if pluralism refers to the plurality of epistemologies, then the current economic discipline would not be considered pluralist.

Moreover, within each dimension of plurality, an assessment of the present argument also requires one to consider the *degree* of pluralism. As noted above, it is hard to classify a discipline as being ‘pluralist’ or ‘not pluralist’ - the question should be *to what extent* a discipline is pluralist in a particular dimension (see also Becker 2017 and section 2). Here, it is helpful to use the distinction between complementary and substitutive theories or methods as introduced in section 2: the toleration of the latter implies a higher degree of pluralism than the toleration of the former. This is not to say that a higher degree of plurality (in all or some dimensions) is always what pluralists demand, but it is to say that if one argues about whether the discipline ‘is pluralist’ or not, one must scrutinize whether the existing plurality refers to complementary or substitutive items.

In behavioral economics, for example, there is one part, represented by people such as Ernst Fehr or Richard Thaler, that challenges the descriptive rationality assumption of economic models and integrates new behavioral assumptions into utility-maximizing models (Fehr and Schmidt 1999; Fehr and Schmidt 2010; Benartzi and Thaler 2007). This research gets regularly published in mainstream journals and researchers enjoy a high prestige within the community. Within a plurality of theories, but not of methods, it offers interesting complementary research insights, particularly as a facilitator for immunizing economic theory from empirical critique via the strategy of *axiomatic variation* (Kapeller 2013): appropriately interpreted, these results only show the superiority of the economic approach by explaining more and more empirical cases with models containing optimizing agents and a systemic equilibrium. Another part of behavioral economics, represented by researchers such as Gerd Gigerenzer or Kumaraswamy Velupillai, argues that—inter alia - the concept of optimization is wrong (Velupillai 2006; Berg and Gigerenzer 2010; Gigerenzer and Gaissmaier 2011). Thus, these researchers propose a substitutive approach, their research is not published in high rank journals and they enjoy little prestige within the economics community, although the excellence of their work is recognized by many other scientific communities such as statistics, psychology or computer science.

In all, the preceding arguments stress the importance to precisely state the dimension and degree of the plurality discussed. While there seems to be openness towards new, even potentially substitutive ideas within the topical dimension, there is limited toleration in epistemological or methodological dimensions, even for complementary approaches).

3.2. If there were a need for pluralism, it would emerge on its own

Some argue that the meritocratic institutions of the economics community render pluralism as the demand for greater plurality superfluous since all (and only) promising approaches pass the “market test” (Lazear 2000) and are considered in the economics community (e.g. Bachmann 2017). Thus, the right degree of plurality is exactly that degree produced by the scientific community.

This argument assumes that the academic institutions provide for a ‘perfect market for economic ideas’ that serves as a selection machine picking the ‘good’ theories/methods/etc. to the right degree. Such a selection process presupposes a ‘level playing field’: new ideas can always enter the academic discourse, they are always considered, assessed, and – if judged useful– respected within the economics community. There is evidence that this presumption is not fulfilled for at least three reasons: (1) the path dependent development of research programs under current scientific institutions, (2) structural obstacles that hinder alternative approaches to enter the mainstream economics discourse, and (3) a monistic curriculum.

First, a level playing field requires scientific institutions that prevent the accumulation of academic power towards a single research program for purely structural reasons. Given the current institutions of the scientific systems, however, different research programs accumulate academic power according to a path dependent and self-reinforcing process: those research programs with many adherents, much influence and greater power are likely to grow relatively faster – irrespective of their potential inherent quality, in whichever way the latter is determined (Sterman and Wittenberg 1999; Dobusch and Kapeller 2009; Kapeller 2010). In the current institutional framework of academic economics, this tends towards a scientific monopolization and makes it hard for new research programs to enter the scientific discourse (Gräbner 2017).

Second, the idea of a perfect market of ideas as presupposed by critiques such as Lazear presupposes that new ideas – irrespective of their origins – are outlined to the scientific community, discussed and assessed. Such an inclusive discourse does not happen in economics. In mainstream outlays less than 3% of total citations refer to heterodox publications. Non-mainstream scholars, on the other hands, cite their mainstream colleagues regularly (see figure 1). Of course, one might conclude that ‘non-mainstream’ outlets are simply of lower quality and therefore not worth being referenced anyway. Yet such interpretation does not align with the fact that ‘mainstream’ papers citing non-mainstream publications tend to have higher impact than those which do not (Aistleitner *et al.* 2017, p. 17; see also Gräbner 2017). The more adequate answer is given by Colander (2010, p. 47): “My honest answer to that question [‘What does mainstream economics think of heterodox economics?’] was that they don’t think about it.” (for empirical evidence based on a citation analysis see e.g. Glötzl and Aigner 2017 or Aistleitner *et al.* 2017). Thus, the forum for a ‘market of ideas’ is simply not given to the extent as claimed by proponents of this argument.

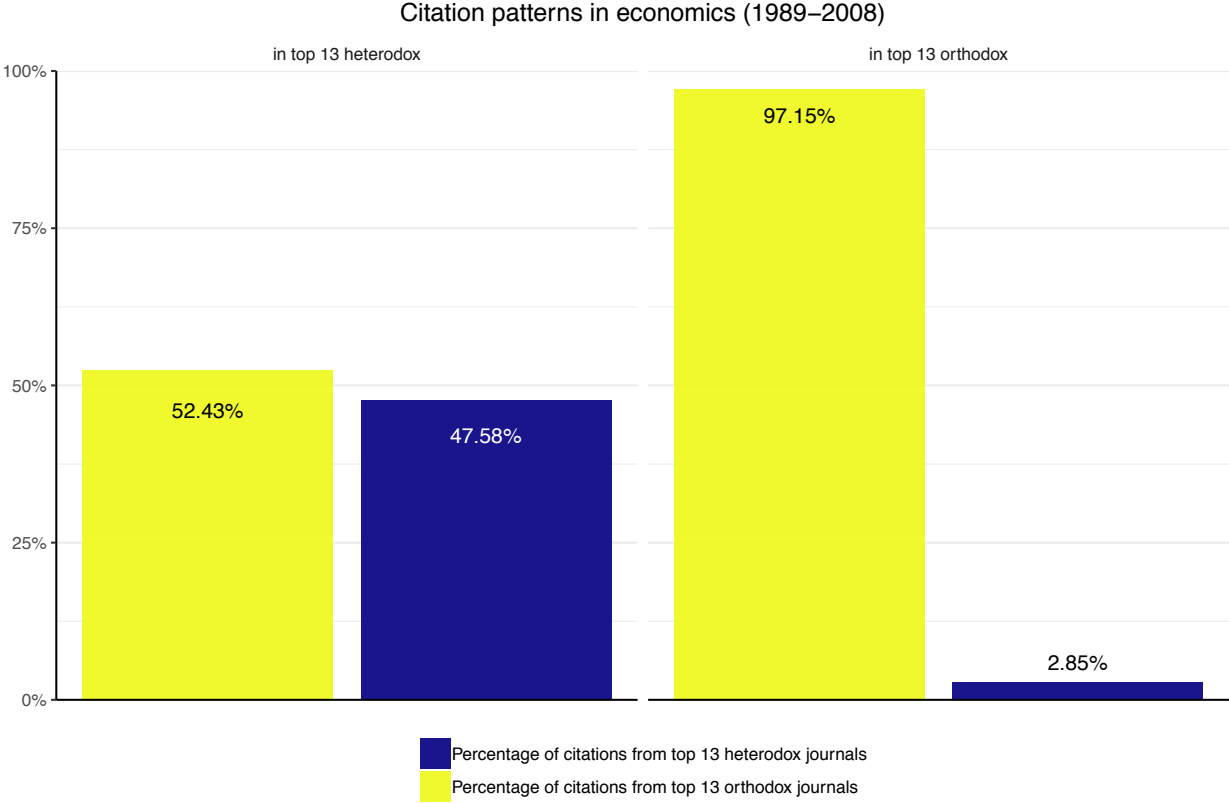


Figure 1: *Citations from and to heterodox journals* (Aistleitner, Kapeller, and Steinerberger 2017).

Finally, a ‘perfect market for ideas’ would also require that students in economics are exposed to a variety of research approaches. Only if the presence of different research programs is indicated to young economists right from the beginning they have a serious choice for what research orientation to follow. Otherwise, junior scientists would be biased towards a dominant way of doing economics, and the dominance of one approach does not necessarily indicate a substantial superiority. However, teaching material in economics is rather monistic, as not only numerous protests of students (e.g. the ‘Exploring Economics’ program (Dimmelmeier et al. 2017), the ‘Rethinking Economics Textbook’ (Fischer et al. 2017), or the open letter of ISIPE in 2014), but also empirical investigations indicate (Lee and Keen 2004; Beckenbach, Daskalakis, and Hofmann 2016).

Altogether, the argument that pluralism would emerge on its own if there was a need for it does not seem to be built on solid foundations. In economics, there is no level playing field for different research programs and its institutions tend to accelerate a corresponding monopolization (Gräbner 2017). In terms of teaching, for example, empirical studies of teaching material and numerous student protests indicate that the weight of the mainstream in teaching is excessive. It is not clear at all how under such circumstances the scientific community should serve as a perfect selection machine of ideas and a ‘market test’ a la Lazear (2000) could be successful. From this it follows that we need to determine the level of plurality desired for ourselves: we cannot source out this discussion to something like the ‘scientific system’.⁴

3.3. Pluralism means ‘anything goes’, and is thus unscientific

The two arguments assessed above refer to the status of the discipline without questioning the concept of pluralism itself. The present argument challenges pluralism on theoretical and epistemological grounds by stating that pluralism means ‘anything goes’, and thereby endangers the scientific status of economics. The phrase ‘anything goes’ has been used by critics of pluralism as a way of expressing their worry that opening the field to pluralism would result in anarchism, which, in turn, is considered non-scientific (e.g. Backhouse 1998, 144; Bachmann 2017). In drastic words: “That way lies the permissive chaos in which the principle that ‘anything goes’ will ripen into the

⁴ Or course, one might evade the previous argument altogether and accept that a perfect selection of ideas does not take place and still argue that the current state of plurality is the adequate one. However, then one would need to provide some justification for this assessment.

dogmas of mob rule, and so usher in the dictatorship of some genocidal popular or ‘proletarian’ boss, such as ‘the great scientist’, Stalin” (Hutchison 1981, 218). Non-scientificness, it is argued, puts the success of the discipline at risk by diminishing shared quality standards.

Yet pluralism does not necessarily imply a demand for anarchism in the sense of ‘anything goes’. Neither do influential pleas for pluralism demand this (Sent 2006; Marqués and Weisman 2008; De Langhe 2010; Dobusch and Kapeller 2012),⁵ nor is methodological anarchism without any commonly shared standards practiced by most advocates of pluralism. Despite the fact that ‘anything goes’ is neither agenda nor practice within pluralist economists’ research communities, the fear among critics remains that pluralism wants to give academic resources to research programs that are ‘not scientific’.

Yet, evaluating the ‘scientificness’ of a research program inevitably leads to the widely discussed problem of demarcation: such evaluation presumes an objective criterion for scientificness, but the relevant philosophical literature largely agrees that such a criterion simply does not exist (see Pigliucci and Boudry 2013 for a recent review of the literature).

Since we cannot meaningfully talk about scientificness or non-scientificness of research programs, accusing research programs of being unscientific is at least problematic. According to a more favorable interpretation, critics mainly worry about supposedly diminishing quality standards, which are thought to put the success of the discipline as a whole at risk. If we evaluate each program according to its own standards, how can we still ensure that research is of high quality? And in the light of the absence of such standards, are we not, in the end, still left with ‘anything goes’?

Against this, one might argue in favor of (broad) quality standards, and against the proposition that the absence of an objective and clear-cut quality standard would mean ‘anything goes’ Kuhn (1977) discusses this for the natural sciences. Despite the fact that there are, according to him, five main standards for theory choice (accuracy, consistency, broad scope, simplicity, and fruitfulness), he argues that these criteria are necessarily imprecise, as well as neither necessary nor

⁵ There might be some proponents of pluralism indeed argue for an ‘anything goes’ in the strict sense. But even if there were some convincing theoretical arguments for such a position, it would be untenable for practical reasons. This is also the view held by the majority of pluralists today (e.g. Caldwell 1997; Sent 2006; Marques and Weismann 2008; Dobusch and Kapeller 2012).

sufficient for good science. Regarding accuracy, for example, Kuhn (1977) points out that Copernicus' system of planetary movement was "not more accurate than Ptolemy's until drastically revised by Kepler more than 60 years after Copernicus's death" (p.323). Regarding consistency, heliocentric astronomy was inconsistent with existing scientific explanation at the time, so that the consistency criterion "spoke unequivocally for the geocentric tradition" (Kuhn 1977, p. 323). While such criteria are important, there are ample examples in the history of sciences where they did not hold for theories that we nowadays unquestionably considered 'better science'.

Kuhn therefore calls these rules *values* instead of criteria, to the effect that (1) it is possible that there might be contradictions without the whole system breaking apart, and (2) the standards used to choose one theory over another, at least in part, hinge on "idiosyncratic factors based on individual biography and personality", as they are values (Kuhn 1977, p. 329). Despite this supposed lack of universal and unambiguous quality standards, hardly anybody would claim that in natural sciences 'anything goes'. A similar argument can be made for economics: recognizing the limits of our current methodologies and epistemologies does not necessarily lead to a total rejection of quality standards. This is consistent with what most adherents of pluralism argue (Caldwell 1997; Sent 2006; Bigo and Negru 2008; Dobusch and Kapeller 2012). Pluralism must still "respect logic, consistency and the stability of meanings within arguments. [I]t should comply with the minimal rules of good argumentation: not anything goes" (Marqués and Weisman 2008, 117). Proposing a broadening of quality standards, as well as a recognition that specific quality standards depend on the purpose of the specific research undertaking, does therefore not mean that these standards are inferior, or that 'anything goes'. It rather implies a more realistic view on scientific practice. It is, however, important to accept at this point that the question of how quality can be ensured poses an important challenge for pluralism. It will, therefore, be discussed in more detail in section 4.

3.4. We need a dominant research program in economics, because that is what determines a mature science

Some argue that the demand for more plurality and the (supposedly) concomitant broadening of quality standards might stand in the way of the progression of economics as a science (Gintis 2009; Colander 2014; Gintis and Helbing 2015), and will be harmful for its overall reputation: "altogether pluralism generates doubts about economics' standing as a science, whereas

dominant approaches tend to reduce these doubts” (Davis 2008, 353).⁶ From this, one might conclude that for the scientific community to function, we need a well-organized and widely accepted consensus on how to do science that every scientist follows, a single research program so to speak (Lakatos 1976). Without a common starting point, no academic debate can take place, and no accumulation of knowledge - hence no progression - is possible. Only once the scientific community has agreed on a certain set of standards, a given scientific discipline develops. On these grounds, Hodgson (2017) criticizes the idea of a ‘heterodox’ economics: missing a common core, he argues, heterodox economics fails to contribute to economics in a substantive way.

One argument against this stresses the lack of means to identify ‘the right’ research program (see also Longino 2002, Kellert *et al.* 2006). Similar to the absence of a single, objective yardstick for ‘scientificness’, we lack a single criterion for the ‘correct way of doing economics’. Against this backdrop, it would be irrational to select one set of methods, theories, etc. and to declare it the core of economics. This uncertainty exists especially because the object of investigation of economics is not objective, external, and unchanging, but inherently constructed and context-dependent (e.g. Rodrik 2015) such that choices regarding the questions asked, the methods used, and the theories referred to cannot be made on objective grounds alone. They are inevitably moulded by our worldviews, be it called *Weltanschauung* (Weber 1922), pre-analytic Vision (Schumpeter 2006), prior beliefs (Peirce 1958 6.146) or perspective (Giere 2006). Because of the resulting fundamental epistemological uncertainty with regard to the optimality of any dominant research program, such programs must be continuously questioned to avoid an intellectual lock-in (see also Heckman et al. 2017). So the lack of a single dominant research program should not be considered a bug, but rather a feature in the light of epistemological uncertainty

A second argument points to a large literature on ‘trade offs’ in modeling (Levins 1966; Weisberg 2006; Matthewson and Weisberg 2008) which has shown (and logically proven) that for any practically relevant situation, there are trade-offs in modeling them, i.e. it is impossible to build a model that scores best in every relevant dimension such as *generality* or *precision*. Thus, depending on the research question, different models must be used (Levins 1966; Matthewson and Weisberg 2008; Goldsby 2013). Similar arguments have been made with regard to sources of evidence (Kuorikoski

⁶ This does not mean that Davis dismisses the call for pluralism, the contrary is the case.

and Marchionni 2016) and research methods (Heesen *et al.* 2016). There is reason to suspect that the result also holds for theories. Different theories and methods all have their strengths, weaknesses and blind spots. Only an effective and properly executed triangulation of different perspectives brings real epistemic progress.

In summary, we agree that *if there were* one single appropriate economic approach that we could identify, focusing on this approach would come with many advantages: if people share a similar conception of how to represent reality, and which model mechanisms are allowed for explanation, then the scientific community can advance quickly (see e.g. Kellert *et al.* 2006, Gräbner 2017). Yet, the epistemological arguments we have made indicate the existence of a trade off: if one focuses on one single research program despite the uncertainty with regard to the existence, uniqueness and identifiability of such a core, the danger of intellectual lock-ins increases considerably, and this is, in the medium run, devastating for any discipline. Yet, the many difficulties that come with the co-existence of various research programs do indeed pose an important (open) challenge to pluralists, and are, therefore, taken up in section 4.

4. Discussion: The challenges for pluralism

The previous elaborations have shown that critiques of pluralism are diverse, sometimes even contradictory and directed at different targets (see table 3): arguments 1 and 2 are critiques of the pluralist movement as such, claiming that the pluralists' demands are unnecessary.⁷ These critiques do not argue against pluralism as a concept. Their 'lesson', if any, is that the pluralist movement and its critics should improve their communication and clarify their language.

Arguments 3 and 4, on the other hand, pose epistemological challenges to the concept of pluralism itself. These should be taken seriously by pluralist contenders. Two main challenges stand out: 'How to ensure quality in the light of broadened research standards?' and 'How to ensure communication in the light of multiple research programs?'. Although there is now an extensive

⁷ Another common argument considers the demand for pluralism to be dishonest: either because a pluralist rather wishes to acquire for her own non-mainstream research program (so called 'strategic pluralism') or because one is interested to push one's own political convictions through the call for pluralism. Because of their direct reference to the acting individuals, both arguments are hard to assess in general.

literature on the potential merits of pluralism, and the seriousness of these challenges has been acknowledged by some pluralists (e.g. Caldwell 1997; Sent 2006; Kellert *et al.* 2006, Marqués and Weisman 2008; Dobusch and Kapeller 2012), these questions have not yet been answered in a satisfactory manner. In the following we make some preliminary suggestions on how adequate answers could be obtained in the future.

Table 2: *Summary of the arguments and classification according to the object of criticism.*

Argument	Object of critique	Response
The discipline is already pluralist	The movement	Depends on what you mean when you say “pluralist”. Openness to new ideas but not to different methodologies.
If there were need for pluralism, it would emerge on its own	The movement	Evidence points to the contrary because of path dependencies in current institutions, uneven citing practices among heterodox and mainstream scholars, and a lack of pluralism in university curricula.
Pluralism means “anything goes”, and is thus unscientific	The concept	Pluralism does not mean anything goes, but it does imply a broadening of research standards. Open question: how to ensure quality?
We need a single dominant research program in economics, because that’s what determines a mature science	The concept	In the light of fundamental epistemological uncertainty we cannot rely on a single way of doing economics, i.e. a single core. Open question: how to ensure progress?

4.1. How to ensure quality? Pluralism and quality criteria

While a move towards more plurality in economics does not necessarily imply the abolishment of quality standards, it certainly does come with a broadening of the standards for ‘good economics’. Such broadening of standards provokes the legitimate question: how is quality of research assured?

Unfortunately, the list of practical and concrete suggestions for ‘pluralist’ quality criteria is regrettably small. This might have contributed to the perception of the mainstream that pluralists do

not care about quality, but only about plurality. The question of finding general quality criteria refers directly to what De Langhe (2010) has called the ‘paradox of pluralism’: pluralism warrants a plurality of views. Yet, if one does not subscribe to relativism, one has to choose among different views. But how can this be done, given a *raison d'être* is granted to all of them? In the following, we first review three suggestions made in the literature that are - on their own – unable to solve the problem. But, as we argue later, a combination of them and some insights from the philosophy of interdisciplinarity might lead us towards a potential solution.

First, for Caldwell (1988; 1997), mutual criticism is the essential constraint that prevents a pluralist economics to fall into the anarchy of ‘anything goes’. In this conception, it is not a set of quality standards, but constant communication and criticism, i.e. a *process* that ensures quality. Yet, such a culture of criticism alone is insufficient to guarantee quality. To start with, the ‘paradox of outside criticism’ (Rolin 2009) questions the feasibility of criticism across research programs: since criticism is always voiced from a specific perspective, it either counts as within criticism, or, if the critic operates on a different dimension than the one being criticized, is opaque to the latter. For example, criticism of an adherent of research program *A* that research program *B* adherents do not offer any viable explanations is a circular argument, since adherents of research program *A* necessarily only refer to research program-*A* standards of explanations (assuming that there would still be certain standards within research programs). This problem would leave us yet again with a naïve relativist position across research programs. Criticism alone does not seem to do the trick.

A second potential solution is to accept the absence of any general criteria, but to use the practical implications of specific theories as a means to discriminate among them. This implies to judge their quality depending on the question at hand. Such a proposal has been made, for example, by Dobusch and Kapeller (2012). Yet, such stance is viable only if one is concerned with applied research questions on which different research programs issue concrete propositions or predictions. Moreover, the appraisal of such propositions is itself dependent on several meta-theoretical considerations, such as the preferred kind of explanation (e.g. functional vs. causal vs. predictive explanations). So, despite being useful in some situations, such an approach does not provide a general solution to the challenge of quality criteria.

A third approach would try to come up with a new set of standards, which are broader than current criteria but still clearly delineate admissible ways of doing research. To start with, there is certainly a set of evaluative meta-criteria generally appreciated by many, such as *transparency*, *consistency* or *accuracy*. Yet, as we also argued above, these criteria are usually not universally applicable, nor are they unambiguous in their formulation. In fact, they are a set of *virtues* rather than strict standards that can be applied directly to evaluate a given research output (c.f. Kuhn 1977, who calls them 'values'). In that sense, while these meta-criteria do provide a starting point for the evaluation of research, they alone remain insufficient.

So, all three solutions remain insufficient on their own. Our proposal is to combine them, and enrich them with some contributions from the philosophy of interdisciplinarity, which deals with similar challenges. On the most general level one could refer to *scientific virtues* (Kellert et al. 2006; Longino 2002; Koskinen and Mäki 2016). These should be both related to the process through which an idea has been produced, as well to the outcome, i.e. the idea itself. On the process side one can require that the idea has been produced within a knowledge system that adheres to rules similar to Longino's (2002) *Critical Contextual Empiricism norms*. According to these rules, any viable knowledge system (1) should provide for venues of criticism, such as accessible conferences or journals, (2) has shown to uptake criticism, i.e. beliefs must be shown to respond to criticism over time, (3) has some enforced standards of evaluation that are transparent to the public, and (4) follows the tempered equality of intellectual authority according to which critiques must not be assessed by the speaker's social position within the epistemic community. On the outcome side one can refer to virtues such as consistency, transparency and accuracy (similar to Kuhn's values). At the same time, not all virtues of these can be applied in all contexts, but there can be an effective mapping from these virtues to particular areas of application, and an idea should be consistent with at least some of them.

Moreover, in addition to the general virtues, one should also assess quality using more strict *criteria*, whose selection depends on the purpose of the investigation at hand: an inquiry aimed at concrete predictions must adhere to other criteria than a hermeneutic inquiry geared towards a better understanding of the actors' motivations, yet for both areas clear quality criteria must exist. Once the purpose of an inquiry is made explicit, the selection of concrete quality criteria gets easier. This implies that the explicit communication of the purpose and the starting point of one's inquiry becomes essential. Such an approach reminds of recent findings in the philosophy of modeling,

which places the ‘construal’ (Weisberg 2007), i.e. the aspired level of accuracy, generality, and mechanistic adequacy, at the center of the analysis of models. A model user making her construal explicit would facilitate effective criticism and quality assessment of research more general (see also Gräbner 2018). This brings us to the next challenge for pluralism.

4.2. How to ensure progress? Effective communication

A second – and related – challenge lies in the triangulation of and communication among the distinct instances that make up plurality. When it comes to a plurality of models, we must ask: how can we triangulate these models? When it comes to a plurality of theories, how are they related to each other? And, more generally, if there is a plurality of research programs, how can effective exchange among the adherents of different research programs be ensured?

Not all advocates of pluralism would subscribe to our claim that interaction and communication is important: as pointed out by De Langhe (2010), there are at least three different kind of pluralists, and only one would agree to our claim: ‘consensual pluralists’ do not care much about communication across research programs because they assume that different models, theories or research programs are independent complements: for purpose A, adherents of research program X can make good contributions, for purpose B the adherents of research program Y are best-prepared. Because of this, communication among them is unnecessary. On the other end of the spectrum, the ‘antagonist pluralists’ claim that communication across different research programs is impossible anyway, so they may as well just co-exist.

We follow the ‘agonist pluralists’, who call for direct interaction, exchange and criticism across research programs. We have two reasons for this preference: First, while it is true that once the purpose of an inquiry is fixed, it is much easier to compare and judge contributions from different perspectives (see section 4.1.), this usually does not eliminate all but one remaining view. There are likely to remain various takes on the same problem, all geared towards the same purpose, and without effective communication among them, an alignment of these perspectives remains impossible.

Second, denying the possibility and necessity for communication across different research program would automatically eliminate important epistemological arguments in favor of pluralism:⁸ not only is effective communication among different research programs a pre-condition for mutual criticism, which has played an important role in the discussion of quality control in the previous section, it is also the pre-condition to harvest the epistemological benefits of pluralism, according to which various perspectives on reality, and their triangulation, improve our understanding of the latter. Yet if people were not able to relate the perspectives to each other, and the perspectives could not enrich each other through direct interaction, the alleged benefit from the plurality of research programs could not materialize. This enrichment does not need to take the form of successful integration or consensus, but can rather refer to the engagement with arguments or results from other research programs (as has been argued similarly in the philosophy of interdisciplinarity, see e.g. Holbrook 2013, Grüne-Yanoff 2016),

Institutionally, we see the need for a ‘symbolic space’, where adherents of different research programs can engage in a “civilized conversation among equals” (McCloskey 2001, 107; see also Longino 2002) and where a constructive channeling of their conflicts can take place (van Bouwel 2009). Unfortunately, such space is not only difficult to construct in practice,⁹ it is also underresearched theoretically: Most frameworks that have been proposed so far, such as the ‘critical pluralism’ of Caldwell (1997), the ‘ontological reflexive pluralism’ (Bigo and Negru 2008) or the ‘interested pluralism’ of Dobusch and Kapeller (2012) either presume a certain level of mutual understanding, or neglect its necessity (exceptions include Dow 2004; van Bouwel 2009).

Thus, we take it for granted that effective communication among distinct research programs is difficult to establish. The remainder of this section seeks to explore avenues of how this communication can be facilitated. Here we make some tentative suggestions for changes in the current institutions, as well as for changes in the practices of the individual researchers:

⁸ Since there are other justifications from plurality (see section 2), a lack of communication would not necessarily mean the end of the pluralist program, yet it would do severe damage to its justification.

⁹ Reasons include: (i) adherents of different research programs use different constructs to represent elements of reality (i.e. they differ in their ‘meaning structure’), (ii) even in case they do use the same concepts they often use different symbolic representations for these (i.e. they differ in their ‘surface structure’), or (iii) they differ in terms of their meta-theoretical vantage points (e.g. what counts as an explanation for an adherent of research program A might not count as an explanation for the adherent of research program B).

First, there must a change of communication practices among researchers. Scholars need to be more transparent with regard to their (meta-)theoretical assumptions and orientations. Similar calls for more extensive model commentary in economics recently came from Rodrik (2018) and Mäki (2018). By clarifying more explicitly what the terms used in an inquiry mean, how concepts are understood in the present framework, or what the success criteria for one's investigation are (the 'construal' according to Weisberg 2007), one facilitates discourse across research programs tremendously (e.g. Bigo and Negru 2008; Gräbner 2018). Such change in practice could be facilitated by exploiting corresponding analytical tools and frameworks from philosophers of science, as illustrated by Gräbner (2018), and by demanding such commentary frameworks for the appendices of published work.

Second, enabling young scholars with the ability to reflect upon programmatic differences and to effectively communicate with different research programs is of prime importance to enable them to conduct the "exercise in hermeneutics" that needs to be at the beginning of any successful cross-programmatic conversation (Dow 2004, 279; see also Garnett 2006). There are a few simple means to do so, and they partly reflect demands of pluralists regarding necessary changes in the education of economics. For example, the inclusion of a mandatory course in the history of economic thought would help students to appreciate different viewpoints. The same holds true for a mandatory course in the philosophy of economics (see also Rodrik 2018): here students would learn the basic terminology that helps to establish a dialogue across research programs. A more extensive justification of such a course, and practical advices on its content is provided by Grüne-Yanoff (2013).

Third, joint 'symbolic spaces' for exchange across research programs can also be explicitly constructed: joint symposia, conference special session and special issues of journals explicitly geared towards the fostering of a discourse across research programs have been proven powerful for fostering interdisciplinary research, and they can play the same role for communication across research programs as well. The recent symposium on Dani Rodrik's *Economics Rules* (Aydinonat 2018) is a nice example.

What becomes clear from this tentative and non-exhaustive list is that any move towards more plurality must always be accompanied with an adequate change in scientific institutions.

Otherwise, communication and triangulation are most likely to fail, which is why the question of how communication can be established between various research programs is of prime importance and deserves more attention by advocates of pluralism.

5. Conclusion

This article discussed four common arguments against pluralism in economics. It was shown that the arguments targeted to the *movement* are either unconvincing (A2: pluralism would emerge on its own) or not precise enough to assess their validity (A1: the discipline is already pluralist). The arguments whose object of critique is the *concept of pluralism* itself, highlighting the necessity of common quality criteria (A3) and a common foundation for research (A4) do present a challenge for pluralists: there is indeed a need for more research on how and which quality standards in a pluralist environment should be ensured, and how effective communication among research programs can be facilitated.

We also made some proposals of how these challenges could be addressed: for assessing the quality of contributions within a pluralist scientific community we suggest to focus on the process of how an idea has been crafted, and to ask whether this process is consistent with certain scientific *virtues*, as discussed in the philosophy of interdisciplinarity. On a more concrete level one can then use more clear-cut criteria, which depend upon the *construal* of the researcher whose idea is assessed. With regard to the second challenge, that of ensuring communication across research programs, we made suggestions concerning the institutions of economics, such as including courses in the history of economics thought and philosophy of economics into economics curricula, demanding more explicit clarifications of meta-theoretical considerations in written research, as well as the explicit construction of ‘symbolic spaces’, in which communication can take place.

The present work entails at least two immediate suggestions for future research: first, large parts of the arguments in this paper were built on epistemological and pragmatic considerations, yet pluralism can also be argued for on, *inter alia*, ethical, political or pedagogical grounds. Evaluating the arguments against pluralism and discussing the challenges from such a different perspective is certainly a promising avenue for future research. Second, in the sense of De Langhe (2010), this paper is written from an agonist perspective. Taking a consensual or antagonist vantage point might

lead to entirely different conclusions, and pursuing and evaluating such route would also be a most valuable contribution.

Our goal here was not to provide a full-fledged theory of pluralism. We do not try to offer a yardstick as to which degree of pluralism in which dimension is the ‘right’ one. For the moment, this is not necessary: in analogy to Sen’s claim that we do not need a perfect theory of justice to be able to detect injustice (Sen 2006), we equally do not need a perfect theory of pluralism to be able to make the claim that the discipline is not pluralist enough (Gräbner 2017). Currently, in many dimensions we can simply state that more plurality is good. Yet, the time will hopefully come when a more specific qualification of pluralism (i.e. the desired degree of plurality in various dimensions) is needed, which is why a further refinement of the justifications of pluralism in economics is warranted. We hope that by taking critiques of pluralism into adequate consideration, we have contributed to this long-term goal.

Acknowledgements

This paper has been presented at the annual conference of the EAEPE in Nice 2018 and the FMM conference in Berlin. We are grateful to the audience for their helpful comments. Moreover, we want to thank Matthias Aistleitner, Svenja Flechtner, and Bernhard Schütz for comments on previous drafts on this paper, and John Davis and Mario Cedrini for their remarks, which helped us getting rid of potentially misleading formulations. We are particular grateful for the extensive feedback of Louis Boon, Katrin Hirte and Johannes Becker. All remaining errors are our own.

References

- Aistleitner, Matthias, Jakob Kapeller, and Stefan Steinerberger. 2017. Citation Patterns in Economics and Beyond: Assessing the Peculiarities of Economics From Two Scientometric Perspectives, *ICAE Working Paper* 60.
- Aydinonat, N Emrah. 2018. Philosophy of Economics Rules: Introduction to the Symposium, *Journal of Economic Methodology*, vol. 25, no. 3, 211-17.
- Bachmann, Rüdiger. 2016. Dani Rodrick - Economic Rules. *Verein Für Socialpolitik*.
<https://www.socialpolitik.de/De/dani-rodrick-economic-rules>.
- Bachmann, Rüdiger. 2017. Zur Aktuellen Pluralismusdebatte in Der Ökonomik: Ansichten Eines Wohlwollenden Pluralismusskeptikers, *Wirtschaftsdienst*, vol. 97, no. 12, 843–47.
- Backhouse, Roger E. 1998. Should Economics Embrace Postmodernism?, In *Explorations in Economic Methodology*, edited by Roger E Backhouse, 134–45. London and New York.
- Beckenbach, Frank, Maria Daskalakis, and David Hofmann. 2016. *Zur Pluralität Der Volkswirtschaftlichen Lehre in Deutschland*, Marburg, Metropolis.
- Becker, Johannes. 2017. Das ‘Richtige’ Maß an Pluralität Und Das Problem Des Fehlenden Adressaten, *Wirtschaftsdienst* vol. 97, no. 12, 835–38.
- Benartzi, Shlomo, and Richard H Thaler. 2007. Heuristics and Biases in Retirement Savings Behavior, *Journal of Economic Perspectives*, vol. 21, no. 3, 81–104
- Berg, Nathan, and Gerd Gigerenzer. 2010. As-if Behavioral Economics: Neoclassical Economics in Disguise?, *History of Economic Ideas*, vol. 18, no. 1, 133–65
- Bigo, Vinca, and Ioana Negru. 2008. From Fragmentation to Ontologically Reflexive Pluralism, *The Journal of Philosophical Economics*, vol. 1, no. 2, 127–50
- Caldwell, Bruce. 1988. The Case for Pluralism, in *The Popperian Legacy in Economics*, edited by Neil de Marchi, 231–44. Cambridge.
- Caldwell, Bruce. 1997. Varieties of Pluralism, in *Pluralism in Economics*, edited by Andrea Salanti and Ernesto Screpanti, 100–104. Cheltenham, UK.
- Cedrini, Mario, and Magda Fontana. 2017. Just Another Niche in the Wall? How Specialization Is Changing the Face of Mainstream Economics, *Cambridge Journal of Economics* vol. 25, no. 4, 427-51
- Colander, David. 2000. The Death of Neoclassical Economics, *Journal of the History of Economic Thought*, vol. 22, no. 2, 127–43.
- Colander, David. 2010. Moving Beyond the Rhetoric of Pluralism: Suggestions for an ‘Inside-the-Mainstream’ Heterodoxy, in *Economic Pluralism*, edited by Robert F Garnett, Erik Olsen, and Martha Starr, 36–47. London and New York: Routledge.
- Colander, David. 2014. The Wrong Type of Pluralism: Toward a Transdisciplinary Social Science, *Review of Political Economy*, vol. 26, no. 4, 516–25.
- Colander, David, Richard Holt, and Barkley Rosser Jr. 2004. The Changing Face of Mainstream Economics, *Review of Political Economy*, vol. 16, no. 4, 485–99.
- Colander, David, Richard P F Holt, and J Barkley Rosser. 2007. Live and Dead Issues in the Methodology of Economics, *Journal of Post Keynesian Economics*, vol. 30, no. 2, 303–12.
- Davis, John B. 2008. The Turn in Recent Economics and Return of Orthodoxy, *Cambridge Journal of Economics*, vol. 32, no. 3, 349–66.
- De Langhe, Rogier. 2010. How Monist Is Heterodoxy?, *Cambridge Journal of Economics*, vol. 34, no. 4, 793–805.
- Dimmelmeier, Andreas, Frederick Heussner, Andrea Pürckhauer, and Janina Urban. 2017. Making the Incommensurable Comparable: A Comparative Approach to Pluralist Economics Education, *European Journal of Economics and Economic Policies: Intervention*, vol. 14, no. 2, 250-66.
- Dobusch, Leonhard, and Jakob Kapeller. 2009. ‘Why Is Economics Not an Evolutionary Science?’ New Answers to Veblen's Old Question, *Journal of Economic Issues*, vol. 43, no. 4, 867–98.
- Dobusch, Leonhard, and Jakob Kapeller. 2012. Heterodox United vs. Mainstream City? Sketching a Framework for Interested Pluralism in Economics, *Journal of Economic Issues*, vol. 46, no. 4, 1035–58.

- Dow, Sheila C. 2004. Structured Pluralism, *Journal of Economic Methodology*, vol. 11, no. 3, 275–90.
- Fehr, E, and K M Schmidt. 1999. A Theory of Fairness, Competition, and Cooperation, *The Quarterly Journal of Economics*, vol. 114, no. 3, 817–68.
- Fehr, Ernst, and Klaus M Schmidt. 2010. On Inequity Aversion: a Reply to Binmore and Shaked, *Journal of Economic Behavior and Organization*, vol. 73, no. 1, 101–8
- Fischer, Liliann, Joe Hasell, J Christopher Proctor, David Uwakwe, Zach Ward Perkins, and Catriona Watson, eds. 2017. *Rethinking Economics. An Introduction to Pluralist Economics*. London and New York: Routledge.
- Flechtner, Svenja. 2018. Pluralism in Economics - How Can This Still Be a Thing?, *Mimeo*.
- Frigg, Roman, and James Nguyen. 2017. Models and Representation, in *Springer Handbook of Model-Based Science*, edited by Lorenzo Magnani and Tommaso Bertolotti, 49–102. Dordrecht, Heidelberg, London and New York, Springer.
- Garnett, Robert F, Jr. 2006. Paradigms and Pluralism in Heterodox Economics, *Review of Political Economy*, vol. 18, no. 4, 521–46.
- Giere, Ronald N. 2006. Perspectival Pluralism, In *Scientific Pluralism*, edited by Stephen H Kellert, Helen E Longino, and C Kenneth Waters, 26–41. Minneapolis, London: University of Minnesota Press.
- Gigerenzer, Gerd, and Wolfgang Gaissmaier. 2011. Heuristic Decision Making, *Annual Review of Psychology*, vol. 62, no. 1, 451–82
- Gintis, H, and Dirk Helbing. 2015. Homo Socialis: An Analytical Core for Sociological Theory, *Review of Behavioral Economics*, vol. 2, no. 1-2, 1–59.
- Gintis, Herbert. 2009. *The Bounds of Reason. Game Theory and the Unification of the Behavioral Sciences*. Princeton and Oxford: Princeton University Press.
- Glözl, Florentin, and Ernest Aigner. 2017. Six Dimensions of Concentration in Economics: Scientometric Evidence From a Large-Scale Data Set, *Ecological Economic Papers*, vol. 15.
- Goldsby, Michael. 2013. The “Structure” of the “Strategy”: Looking at the Matthewson-Weisberg Trade-Off and Its Justificatory Role for the Multiple-Models Approach, *Philosophy of Science*, vol. 80, no. 5, 862–73.
- Graupe, Silja. 2017. Beeinflussung Und Manipulation in Der Ökonomischen Bildung - Hintergründe Und Beispiele, Düsseldorf: FGW Studie Neues Ökonomisches Denken 05.
- Gräbner, Claudius. 2017. The Complexity of Economies and Pluralism in Economics, *Journal of Contextual Economics*, vol. 137, no. 3, 193–225.
- Gräbner, Claudius. 2018. How to Relate Models to Reality? an Epistemological Framework for the Validation and Verification of Computational Models, *Journal of Artificial Societies and Simulation*, vol. 21, no. 3.
- Grüne-Yanoff, Till. 2013. Teaching Philosophy of Science to Scientists: Why, What and How, *European Journal for Philosophy of Science*, vol. 4, no. 1, 115–34.
- Grüne-Yanoff, Till. 2016. Interdisciplinary Success Without Integration, *European Journal for Philosophy of Science*, vol. 6, no. 3, 343–60.
- Heckman, James J, George Akerlof, Angus Deaton, Drew Fudenberg, and Lars Hansen. 2017. Publishing and Promotion in Economics: the Curse of the Top Five, AEA Roundtable Discussion at ASSA in Chicago. <https://www.aeaweb.org/webcasts/2017/curse.php>.
- Hodgson, Geoffrey. 2017. The Pathology of Heterodox Economics and the Limits to Pluralism, *Mimeo*.
- Holbrook, J. B. (2013). What is interdisciplinary communication? Reflections on the very idea of disciplinary integration. *Synthese*, vol. 190, no. 11, 1865–1879.
- Hutchison, Terence W. 1981. *The Politics and Philosophy of Economics*. New York: New York University Press.
- Kapeller, Jakob. 2010. Citation Metrics: Serious Drawbacks, Perverse Incentives, and Strategic Options for Heterodox Economics, *American Journal of Economics and Sociology*, vol. 69, no. 5, 1376–1408.
- Kapeller, Jakob. 2013. ‘Model-Platonism’ in Economics: on a Classical Epistemological Critique, *Journal of Institutional Economics*, vol. 9, no. 2, 199–221.
- Kellert, Stephen H, Helen E Longino, and C Kenneth Waters, eds. 2006. Introduction: the Pluralist Stance, In *Scientific Pluralism*. Minneapolis, London: University of Minnesota Press, p. vii–xxix.
- Koskinen, Inkeri, and Uskali Mäki. 2016. Extra-Academic Transdisciplinarity and Scientific Pluralism: What Might They Learn From One Another?, *European Journal for Philosophy of Science*, vol. 6, no. 3, 419–44.
- Kuhn, Thomas S. 1977. Objectivity, Value Judgment and Theory Choice, In *The Essential Tension*, 320–39.

- Chicago and London.
- Lakatos, Imre. 1970. Falsification and the Methodology of Scientific Research Programmes, In *Criticism and the Growth of Knowledge*, edited by Imre Lakatos and Alan Musgrave, 91–196. Cambridge, UK.
- Lakatos, Imre. 1976. Falsification and the Methodology of Scientific Research Programmes, In *Can Theories Be Refuted?*, edited by Sandra G Harding, 205–59. Dordrecht, NL, Boston, MA: D. Reidel Publishing Company.
- Lazear, E P. 2000. Economic Imperialism, *The Quarterly Journal of Economics*, vol. 115, no. 1, 99–146.
- Lee, Frederic S, and Steve Keen. 2004. The Incoherent Emperor: a Heterodox Critique of Neoclassical Microeconomic Theory, *Review of Social Economy*, vol. 62, no. 2, 169–99.
- Levins, Richard. 1966. The Strategy of Model Building in Population Biology, *American Scientist*, vol. 54, no. 4, 421–31.
- Lipsey, Richard G. 2001. Successes and Failures in the Transformation of Economics, *Journal of Economic Methodology*, vol. 8, no. 2, 169–201.
- Longino, Helen E. 2002. *The Fate of Knowledge*. Princeton and Oxford: Princeton University Press.
- Marqués, Gustavo, and Diego Weisman. 2008. Not Anything Goes: A Case for a Restricted Pluralism, *The Journal of Philosophical Economics*, vol. 2, no. 1, 115–36.
- Matthewson, John, and Michael Weisberg. 2008. The Structure of Tradeoffs in Model Building, *Synthese*, vol. 170, no. 1, 169–90.
- Mäki, Uskali. 1997. The One World and the Many Theories, In *Pluralism in Economics*, edited by Andrea Salanti and Ernesto Screpanti, 37–47. Cheltenham: Edward Elgar.
- Mäki, Uskali. 2018. Rights and Wrongs of Economic Modelling: Refining Rodrik, *Journal of Economic Methodology*, vol. 14, no. 4, 1–19.
- McCloskey, Deirdre Nansen. 2001. The Genealogy of Postmodernism: an Economist's Guide, In *Postmodernism, Economics, and Knowledge*, edited by Stephen Cullenberg, Jack Amariglio, and David F Ruccio, 102–28. London.
- Pigliucci, Massimo, and Maarten Boudry, eds. 2013. *Philosophy of Pseudoscience. Reconsidering the Demarcation Problem*. Chicago, IL: University of Chicago Press.
- Rodrik, Dani. 2015. *Economics Rules*. Oxford, UK: Oxford University Press.
- Rodrik, Dani. 2018. Second Thoughts on Economics Rules, *Journal of Economic Methodology*, vol. 25, no. 3, 1–6.
- Rolin, Kristina. 2009. Scientific Knowledge: A Stakeholder Theory, In *The Social Sciences and Democracy*, edited by Jeroen van Bouwel, 62–80. Chippenham and Eastbourne: Palgrave.
- Schumpeter, Joseph A. 2006. *History of Economic Analysis*. London and New York: Routledge.
- Sen, Amartya. 2006. What Do We Want From a Theory of Justice?, *Journal of Philosophy*, vol. 103, no. 5, 215–38.
- Sent, Esther-Mirjam. 2006. Pleas for Pluralism, In *Real World Economics a Post-Autistic Economics Reader*, edited by Edward Fullbrook, 177–84. London.
- Sterman, John D, and Jason Wittenberg. 1999. Path Dependence, Competition, and Succession in the Dynamics of Scientific Revolution, *Organization Science*, vol. 10, no. 3, 322–41.
- Sugden, Robert. 2000. Credible Worlds: the Status of Theoretical Models in Economics, *Journal of Economic Methodology*, vol. 7, no. 1, 1–31.
- van Bouwel, Jeroen. 2009. The Problem with(Out) Consensus: the Scientific Consensus, Deliberative Democracy and Agonistic Pluralism, in *The Social Sciences and Democracy*, edited by Jeroen van Bouwel, 121–42. Chippenham and Eastbourne: Palgrave.
- Velupillai, K. Vela. 2006. Algorithmic Foundations of Computable General Equilibrium Theory, *Applied Mathematics and Computation*, vol. 179, no. 1, 360–69.
- Weber, Max. 1922. Die Objektivität Sozialwissenschaftlicher Und Sozialpolitischer Erkenntnis, in *Gesammelte Aufsätze Zur Wissenschaftslehre*, 146–214. Tübingen, DE.
- Weisberg, Michael. 2006. Forty Years of ‘the Strategy’: Levins on Model Building and Idealization, *Biology & Philosophy*, vol. 21, no. 5, 623–45.
- Weisberg, Michael. 2007. Who Is a Modeler?, *The British Journal for the Philosophy of Science*, vol. 58, no. 2, 207–33.