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Wine and bottles. Some remarks on "The Two Blades of Occam's Razor in Economics: Logical and Heuristic" by Giandomenica Becchio

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The express ambition of this thought-provoking paper is to flesh out a distinction between two senses of "Occam's razor" in order to argue for more "realism" in economics.

Becchio distinguishes the two senses as simplicity and parsimony, defining the latter, in Occam's words as 'in vain is that explained by many things which can be explained by fewer things' (p.1). Becchio calls this a 'powerful heuristic tool' and hopes to provide philosophical backing for '[s]ome approaches of heterodox economics', more precisely for 'models grounded on realistic initial assumptions and able to embed complexity into the general explanation of economic behaviour' (abstract).

As I will argue, while this philosophical ambition is to be saluted, the specific claims about the logical connection of Occam's principles, parsimony, heuristics and the realism of assumptions are too vague to be persuasive. More analytical work is needed on identifying common criteria of theoretical success to compare economic models, theories and research programmes. The most charitable reading is that the two blades correspond to two such criteria that tend to point in different directions.

Arguments about the perceived excessive abstraction and lack of realism has a long history in economic theory, going back at least to the German *Methodenstreit* some 150 years ago. It has been a staple of methodological debates in economics ever since, with Friedman's (1953) paper on the methodology of positive economics, the growth of experimental approaches and the behavioural turn in economics standing out as more recent milestones. (Notice how the milestone metaphor is suggestive of progress.) Compared to these, the ambition of Becchio's paper is to show the superiority of 'realistic' models in a new way, i.e. in terms of parsimony.

A related but less elaborated theme of the paper concerns the specificity of 'human' or 'social' science amongst the sciences. This theme has also been on the methodological agenda of economic theory since at least J.S. Mill's engagement with Comte's positivism (Mill, 2015) but as it receives less attention, I will not discuss it further.

Against this background, Becchio's attempt to exploit the analytical potential of 'Occam's razor' to reframe the discussion is both promising and risky. If one seeks to contribute to progress in these debates, reframing them in unexpected terms may be illuminating and rewarding. It would indeed be an important theoretical feat to demonstrate that 'Occam's razor' has the desired methodological implications for economics, justifying a move towards 'parsimony' *and thereby* 'realism'. The risk is, of course, that the attempt may turn out to be yet another highly abstract critical argument against rational choice theory in the name of (whatever is understood as) 'realism' which rephrases old arguments in new terms without moving the substantive discussion forward. To put it metaphorically, the success of the paper hinges on whether it is able to fortify heterodox economics with the spirit of Occam, or whether it serves to economists some old (methodological) wine in new (Occamian) bottles.

Let's start with the 'bottles'. The paper's conceptual frame and terminological choices are surprising at first, especially to those who recall Albert Hirschman's paper, entitled

'Against Parsimony: Three Easy Ways of Complicating Some Categories of Economic Discourse'.[1] To be sure, nobody is bound by Hirschman's terminology. Defending heterodox economics as parsimonious, as Becchio does, suggests an innovative approach or at least a different rhetoric that may be just as persuasive in suggesting alternatives to neoclassical models in economics as the arch-heterodox Hirschman's arguments for realism *at the expense* of parsimony.

The rhetorical framing of distinguishing simplicity and parsimony seems to be inspired by a late paper by Herbert Simon (2001), an economics Nobel laureate and by general consensus a pioneer of what is now loosely called behavioural economics. Simon's paper uses the dichotomy in a wide-ranging and highly formal discussion of information theory, and illustrates the more abstract points by a retrospective overview of some substantive arguments in his earlier work on empirical decision theory. For Simon, the distinction of simplicity and parsimony refers to how through the identification and representation of redundancies, science seeks to identify patterns in a set of data and then represent them in the most parsimonious way. In particular, while the title of Simon's paper suggests an opposition of the two concepts, he in fact defines parsimony as a specific case of simplicity, itself being the reciprocal of the complexity of a data set.[2]

Becchio has, understandably, little to say on such matters of information theory; her focus is on substantive and methodological issues in economics. For her, the dichotomy of simplicity and parsimony serves as a suggestive rhetorical framing, with a highly respectable Occamian pedigree. The substantive idea driving the paper is the following: we should be concerned at least as much with one aim of economic theorising: 'realism' (somehow achieved through the use of one 'blade' of Occam's razor, parsimony) as with the other: 'simplicity' (the other 'blade' of Occam's razor, as well as the methodological common denominator and driving force of 'neoclassical' economics). So far, we have three concepts in two juxtapositions then. The success of Becchio's proposal depends on how the two criteria or aims of parsimony and realism relate to each other.

The conceptual landscape is complicated further when the author suggests mapping the distinction of simplicity versus parsimony onto the dichotomy of a (pure) logical (tool) versus (a) heuristic. The meaning of this opposition between logic and heuristic is somewhat opaque but it relates to a key concern of the author: a certain 'trade-off between simplicity and realism' which is specific to 'the human sciences'.[3] I will briefly return to this question of 'bottles', i.e. the conceptual and terminological choices of the paper at the end of this comment. Let's now turn to the 'wine', i.e. the substantive points in the paper concerning the simplicity – realism trade-off and the argument for realism in economics.

To start with, the reader is referred to some of the earlier explications of the idea of simplicity in the history of economics. The debate surrounding Milton Friedman's 1953 paper

[1] Hirschman, 1984. In Cserne 2019, I identify and analyse three arguments for parsimony in economics, using the term roughly in Hirschman's sense.

[2] 'The primordial acts of science are to observe phenomena, to seek patterns (redundancy) in them, and to redescribe them in terms of the discovered patterns, thereby removing redundancy. The simplicity that is sought and found beautiful is the simplicity of parsimony, which rests, in turn, on the exploitation of redundancy. We do not seek the absolutely simplest law but the law that is simplest in relation to the range of phenomena it explains, that is most parsimonious' (Simon, 1997 p. 6). I am quoting from what appears to be the working paper version of Simon's 2001 chapter as I had difficulties accessing the 2001 version under the current circumstances. In the final version of her paper, Becchio (p. 2) acknowledges that parsimony is 'a proper subset of simplicity'.

[3] 'In using Occam's razor as a pure logical tool, one that gives simplicity to a model, neoclassical economics commits a fault: it neglects the fact that in the human sciences a trade-off between simplicity and realism exists, and this trade-off cannot be confused with the degree of abstraction that characterizes the object of any natural science, like physics, because human behaviour cannot be confused with the behaviour of, say, atoms' Becchio p. 3.

on 'The methodology of positive economics' is crucial in this respect. Yet, unfortunately, we are left without the author's definite take on Friedman's methodology. While she summarises some of the subsequent discussion (of special interest here is Ernst Nagel's critique of Friedman's methodology, based on the claim that Friedman failed to distinguish among three kinds of 'unrealism') and introduces a distinction between abstraction and idealisation (Becchio pp. 7-8), the reader is left perplexed as to what the lesson of the debate is. It is also perplexing what is implied when the author puts Friedman and Samuelson in the same category of 'positivists', using the term with a clear disapproval. Could this mean that she considers the entire debate around Friedman's methodological stance irrelevant or misguided? If so, why bother discussing it? If valid and relevant points have been raised in the debate, what are these?

As for simplicity, Becchio is right in referring to the difficulties in defining, let alone measuring it (Becchio p. 4 n 8). In a later turn of the argument, she even denies that under a reasonable definition of simplicity, neoclassical models are simple: their 'simplicity becomes apparent and is misleading' (Becchio p. 6). Clearly, there is a case to argue that one kind of simplicity may lead to the lack of it in another sense, for instance when accounting for certain empirical phenomena requires *ad hoc* assumptions and cumbersome adjustments to an initially simple model. In fact, Becchio distinguishes four versions of simplicity. Clearly, more analytical effort is needed here in identifying how these versions, including parsimony ('a proper subset of simplicity') are related. As simplicity is not the only possible virtue of models, theories and research programmes, more needs to be said about how simplicity competes with or complements other criteria of theoretical success, before a meaningful assessment of various types of economic models can be made.

In a subsequent paragraph of section 2, Becchio moves on to discuss 'the reduction of complexity' (Becchio p. 8) achieved in rational choice theory, in particular through the *homo oeconomicus* model. Again, she seems to work under the assumption that by summarising certain claims raised in earlier debates, for instance, by quoting Rosenberg who called rational choice theory 'formalized folk psychology'[4], she has performed a satisfactory critical analysis.

In sum, section 2 offers, a brief and sketchy overview of some debates on 'simplicity' and 'realism' in 'mainstream' or neoclassical economics. Based on the claim that 'neoclassical economics rests on hypotheses and assumptions that are not just simple (in terms of Occam's razor) but oversimplified and inconsistent with reality' (p. 6), her conclusion seems to be that 'neoclassical economics […] does not explain the *complexity* of human actions in a *realistic* way' (p. 9, emphasis in the original). How one should interpret this claim depends crucially on what is meant by 'realistic'. For the argument from realism to get off the ground as philosophy of economics, an explicit conception of realism in theory-building is required. Although the references (to Nagel, Mäki and others) suggest that the author is aware of possible starting points, unfortunately this key concept is not explicated in a systematic way in the paper. To provide a meaningful and reasonable criticism of neoclassical economics in terms of the simplicity-realism trade-off, requires further analytical effort in explicating, operationalising and measuring both (dimensions of) simplicity and 'consistency with reality' as criteria of theoretical success.

[4] The subsequent quote from Buchanan (on p. 9) is not easy to interpret, nor is it clear what role it plays in Becchio's argument. Is it an illustration of the criticised position or an endorsement of the author's criticism? On the face of it, it does not seem to support either. It is difficult to discern what Buchanan means by the potentially confused spatial metaphor of 'within the boundaries between…'. Does he refer to a theoretical space in between theories, i.e. a third one different from both? Or does he mean the intersection of the theories, thus recognising some common features of both?

In section 3, the author introduces what is supposed to be another interpretation ('blade') of Occam's razor which, in the hands of 'heterodox' economists, leads to results that the author finds superior in terms of the simplicity-realism trade-off. As noted above, there is some terminological confusion arises when the second interpretation of Occam's razor as parsimony is characterised as (a) 'heuristic'. This terminology is, however used in an ambivalent way, generating confusion. From the start, it is unclear whose use of heuristics is referred to. The term can refer to either (1) the methodological rule of thumb used by researchers while building theories or (2) to specific features of human behaviour under a certain theoretical description, namely when (economic) agents are modelled as using rules of thumb while navigating their complex environment. This ambivalence is left unresolved and becomes especially pertinent in the discussion of Gigerenzer's theory. One way to resolve it would be to naturalise the former use, i.e. (1') re-describe theory-building behaviouristically as a human activity, as a special case of human decision-making. Such a naturalised theory of science is perhaps broadly in line with Gigenrenzer's or Herbert Simon's approach to (economic) theorising but it is in tension with the rest of the paper's stance as normative philosophy of science. In fact, it seems that the author refers to heuristics in the original sense (1) and remains within the domain of analytical and normative philosophy of science, when contrasting one type of models or method ('neoclassical', 'static', 'mathematical-deductive') with another, preferred, type of 'alternative models, such as rhetoric, persuasion, metaphors, and heuristics' (Becchio p. 9).

In the second half of the paper, the author's aim is both to explicate parsimony as one (or the?) adequate criterion of theoretical success, and to demonstrate how this criterion favours heterodox economic models over neoclassical ones. This is a significant task, and in a few pages, there is hardly enough room for more than assertions and hints. Thus, the author asserts that by using Occam's razor as a 'heuristic tool', one could 'build up a coherent and realistic theory of human behaviour and economic dynamics in social terms' (Becchio, p. 9) It is mainly through hints at Herbert Simon's ideas about satisficing behaviour and Gigerenzer's evolutionary theory of heuristics that this claim is to be made plausible. Thus, the author suggests (p. 11):

> 'If we intend satisficing as a humanly rational strategy, it appears simpler and more frugal than maximizing because in this scenario, individuals are following the rule of thumb in a dynamic context; while in the neoclassical scenario individuals are optimizers in a static and non-realistic context of perfect knowledge and complete information.'

Satisficing as an empirical generalisation about human behaviour or Gigerenzer's 'fast and frugal heuristics' approach are surely possible starting points of a fruitful and powerful research programme. Yet it is worth keeping in mind that their specific models of human behaviour are subject to the simplicity/realism trade-off in the same manner as are models of maximisation or optimisation. At the very least, a meaningful comparison of rational choice, satisficing, 'heuristics and biases' or 'dual processing' models requires the use of the same criteria of success. Thus, a fruitful question here is: under what criteria and in what contexts are these 'alternative models' superior to the former ones.[5]

Let me return to the question of bottles, i.e. the terminological and conceptual choices of the paper and the possible theoretical motivations for these choices. Thus far, I have assumed that the main concern of the paper is a certain trade-off between simplicity and

[5] At an earlier point in the argument (p. 6 n. 15), the author cites blanket criticisms of neoclassical model-building as a 'powerful rhetorical discourse' and 'pseudo-science'.

realism. As far as this is correct, there are various possible framings of the problem which can be compared in terms of transparency, rhetorical power and other criteria. As far as the explicit arguments in Becchio's paper go, some bottles are better than others.

It is doubtful whether the paper's substantive argument for realism is made any stronger by linking it to Simon's 2001 paper, even when he explicitly refers to Occam. Simon the information theorist uses an analytical distinction between simplicity and parsimony and does not talk about 'realism'. Nor does he imply the choice of parsimony over simplicity as a superior criterion of inter-theoretical comparison. If Becchio wants to characterise simplicity and realism as a trade-off, how is it coherent with Simon's specification of parsimony as a version of simplicity? It seems that the invocation of parsimony or Occam's razor is neither necessary nor sufficient to support the comparison of various economic models in terms of realism and simplicity.

To recall, Hirschman, the arch-heterodox economist followed another, rather conventional methodological route, *viz*. to argue in favour of realism and against parsimony. To put it differently, Hirschman did not see realism and parsimony as necessarily pointing in the same direction. This suggests that there is a possible trade-off between the two. This conceptual framework allows for a rather simple, perhaps simplified, but transparent explanation of how standard and heterodox models are conventionally compared in economics: a gain in realism at the expense of simplicity.

As a variant on this conventional conceptual strategy, consider Richard Thaler (1992, p. 198), another Nobel laureate and founder of behavioural economics, who once noted that devising accurately descriptive models of human behaviour is difficult because many theorists have a 'strong allergic reaction to data'. Moreover, economic models based on the assumption of rationality are 'elegant with precise predictions', while behavioural research tends to be 'messy, with much vaguer predictions'. He then asked a rhetorical question: 'would you rather be elegant and precisely wrong, or messy and vaguely right?' (Thaler, 1992, p. 198). This suggests that there are two important dimensions of inter-theoretical comparison; furthermore, one (truth, something similar to realism) is more important than the other (elegance, perhaps something akin to simplicity).

Undoubtedly, philosophers of economics feel a strong temptation to go beyond these conventional and unsophisticated metatheoretical frameworks. If this motivates them to innovative rhetorical framings and conceptual innovations, such as the invocation of Occam, the dissociation of simplicity and parsimony and the association of parsimony and realism, the result is always refreshing and potentially fruitful.

Yet if one starts to speculate about the ultimate underlying ambition of this paper, there is a certain ambiguity. Are the claims meant as conceptual or substantive ones? It may be possible to carve out an argument that the two criteria, realism and parsimony necessarily point in the same direction: this would require some conceptual heavy lifting. It is also possible that in a comparison of two theories or two models, the first is both more realistic and more parsimonious than the other. To make the substantive (empirical) argument that this is (or is not) the case for any two specific pairs (or n-tuples) of theories or models, one needs, apart from a minimal conceptual clarity, to operationalise and measure theories and models in these two dimensions. If Becchio wants us to take either of these less conventional routes further, she owes us a more elaborate argument.

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