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Neoclassical, mainstream, orthodox, and heterodox economics

Abstract: *This paper discusses the concepts of neoclassical, mainstream, orthodox, and heterodox economics, distinguishing temporally more general and more specific concepts. The concept of mainstream economics is based on prestige and influence and includes ideas taught in prestigious schools. Although the current mainstream (neoclassical economics included) is clearly diverse, commonality in it is more controversial. Heterodox economics can be defined negatively, in opposition either to the orthodoxy or to the mainstream. The lack of consensus generates communication problems. Another possibility would be to define heterodox economics positively, but the result in the current period may be an empty set.*

Key words: *heterodox, mainstream, neoclassical, orthodox, schools of thought.*

Economics, like other social sciences, has always been marked by the coexistence of different schools of thought (or approaches, etc.). There are indeed significant differences among several schools, so that identifying and classifying them is important. In their exercises of classification, economists have used a plethora of labels to designate these schools. Prefixes such as "neo," "new," "old," and "post" have been employed. Sometimes, with or without these prefixes, so have adjectives such as classical, institutionalist, and so on. Other times, the chosen adjectives are derived from the name of a particular individual, such as Ricardo, Marx, Walras, Keynes, Schumpeter, and so on. In addition to the question of how to distinguish among the schools, this latter practice often raises the troublesome question of how faithful the members of each school are to the thought of its supposed founding father or its source of

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inspiration. At a higher level of generality are labels such as *mainstream, orthodox,* and *heterodox.*

Labels may be helpful, but they may also be confusing. In any case, their use seems inevitable given the considerable variation among groups of economists and their ideas. The present paper is concerned with some of the more general labels, especially with *mainstream, heterodox,* and *orthodox,* as well as with one of the more specific labels—namely, *neoclassical.*

Different economists use these terms in different ways. Moreover, developments over the past two or three decades have made the conceptual relation between neoclassical and mainstream economics even more complicated than it already was. Consequently, the definition of heterodox economics has also become more problematic.

In addition, the debate on the meaning of these terms has suffered from a frequent lack of clarity about the temporal range of application of the concepts. In particular, sometimes authors propose a concept without specifying the period or periods to which it is intended to apply; it also happens that authors oscillate between a more temporally general and a more specific concept, without making this clear.

The present paper is intended to contribute to this debate by specifying different concepts and by doing so while making it explicit that some concepts are temporally general while others, usually referring to the current period, are temporally specific.

Neoclassical economics

Defining neoclassical economics is not easy, not least because what one may call neoclassical economics has changed over the years. A broad definition would apply to the original neoclassical economics, founded in the 1870s, as well as to later work. Another difficulty is that even at one given moment of time the term is not necessarily used in the same sense by everybody.

What is called here neoclassical economics is characterized by the combination of the following features:

1. the emphasis on rationality and the use of utility maximization as the criterion of rationality,
2. the emphasis on equilibrium or equilibria, and
3. the neglect of strong kinds of uncertainty and particularly of fundamental uncertainty.[1]

[1] This characterization bears a general similarity with the ones put forward by Hodgson (1999, pp. 29–30) and by Colander, Holt, and Rosser (2004).

As we will see in the next section, strict adherence to this characterization is not necessary to establish a distinction between neoclassical and mainstream economics, but it serves as a very good approximation.

Mainstream economics

An interesting and useful concept of mainstream economics has been proposed by Colander, Holt, and Rosser: for them, "mainstream economics . . . is in large part a sociologically defined category. Mainstream consists of the ideas that are held by individuals who are dominant in the leading academic institutions, organizations, and journals at any given time, especially the leading graduate research institutions. Mainstream economics consists of ideas that the elite in the profession finds acceptable, where by 'elite' we mean the leading economists in the top graduate schools" (2004, p. 490). As I understand Colander, Holt, and Rosser, they allow people who are not members of the elite to be part of mainstream economics; all that is required is to share the ideas of the elite.[2]

In comparison with Colander, Holt, and Rosser, I favor a somewhat different variety of sociological concept of mainstream economics. I prefer to say that mainstream economics is that which is taught in the most prestigious universities and colleges, gets published in the most prestigious journals, receives funds from the most important research foundations, and wins the most prestigious awards.[3]

There are some small but possibly relevant differences between this way of describing mainstream economics and Colander, Holt, and Rosser's. Using a sociological concept of mainstream economics, based on prestige

[2] Consider, for example, the following statements, which imply that the elite is not the same as the set of mainstream economists: the elite "is those mainstream economists who have made important contributions to thought in the past" and "there is an elite element in the mainstream" (Colander et al., 2004, p. 492). For an apparently different interpretation, see Koppl (2006). He attributes to Colander, Holt, and Rosser the view that "the 'mainstream' is the elite of the profession" (ibid., p. 232).

[3] I have been interested in the sociological aspects of mainstream economics for several years now. In an earlier article, I referred to mainstream economics (without defining it) as being "considered a form of knowledge, supported by the prestige of the universities in which it is taught and of the journals in which it is published" (Dequech, 1999, p. 422). I had also referred to the prestige of consultants from top universities and argued that heterodox economists should pay attention to it (Dequech, 1998). Another interesting aspect that has long caught my attention is the recantation of some economists after receiving the Nobel Prize. In part, this has a sociological component in that the prestige of the prize makes it easier for these economists to publicly criticize widely accepted ideas. (I return to this below.)

and influence, does not require one to focus so much on the ideas of the elite or to define the elite as restrictively as Colander, Holt, and Rosser. As these authors point out in a fascinating discussion, the diffusion of new ideas among what they call the elite will occur several years or even some decades before these ideas can make their way into undergraduate textbooks, whose contents are more resistant to change (ibid., p. 494). Let us imagine, thus, a situation in which the ideas of a substantial part of the elite have become quite different from the ideas taught at the undergraduate level, even in the most prestigious universities and colleges. If the latter ideas are taught at prestigious schools, in my opinion, they should still be considered as part of mainstream economics. As the concept may apply both to ideas and to people (something that Colander, Holt, and Rosser also accept, in practice), supporters of these ideas would also be elements of the set of mainstream economists. In turn, this would allow teachers of undergraduate courses in less prestigious universities and colleges (who probably remain for a longer time unaware of new developments at the edge of the profession) to be more easily considered mainstreamers.[4] A similar result may perhaps be obtained if the concept of the elite is broad enough to include undergraduate professors at the most prestigious universities and colleges (unless they no longer believe what they teach at the undergraduate level).

Understandably, Colander, Holt, and Rosser (ibid.) wish to emphasize the dynamic, forward-looking aspects of the concept of mainstream economics. They have made an important contribution to our understanding of how widely accepted ideas change in economics (see also Davis, 2006, who argues along similar lines, emphasizing the differences between instruction and research). From the perspective adopted here, however, the weight of the factors of change within the mainstream may be lower than these authors seem to suggest. This is due, for example, to my inclusion of some teachings at the undergraduate level in the set of ideas forming mainstream economics. Once the contents of the most prestigious and influential undergraduate textbooks are considered part of mainstream economics, the mainstream may still change, but part of it changes more slowly.

[4] This issue has implications for the relation between mainstream economics and orthodoxy. If one excluded these undergraduate professors at less prestigious universities and colleges from mainstream economics, they would have to be considered members of an orthodoxy that is not part of the mainstream or members of the heterodoxy, despite the prestige of the ideas they support (if this triple list of categories is exhaustive). I am not sure that Colander, Holt, and Rosser would like either of these implications.

At any rate, defined in sociological terms (which do not have to be exactly along the lines suggested by Colander, Holt, and Rosser or by the present paper), mainstream economics does not need to be internally consistent. In principle, ideas that are very much in contrast with each other may all belong to mainstream economics. Relatedly, mainstream economics does not have to correspond to any particular school of thought (Colander et al., 2004, p. 490), whereas a school is defined by a particular set of ideas and, presumably (or ideally), is internally consistent. Different schools of thought, as well as sets of ideas that have not yet developed into a school of thought, may belong to mainstream economics at the same time. When seen in this light, the term *mainstream* would be problematic if taken literally—that is, if interpreted as referring to a single stream (in the sense of a school of thought).

Defining mainstream economics in sociological terms is not incompatible with identifying shared elements among the ideas forming the mainstream economics of a particular historical period. A sociological concept of the mainstream does not require these shared elements to exist, and it does not prevent them from existing for some time. Identifying these elements amounts to identifying the sort of theoretical, methodological, or political ideas that have managed to become prestigious and influential during some period and seeing what they have in common, if anything.

The sociological concept of mainstream economics is the most general of all, in the sense that, by definition, mainstream economics would always have the social characteristics of prestige and influence, whereas the theoretical, methodological, or political characteristics of the mainstream (those that for some time have prestige and influence) can change over time. Identifying the intellectual contents of the mainstream of *a particular period* is therefore compatible with a sociological concept of mainstream economics. The latter can be applied to any period of the history of economic thought, especially after the creation of economics as a separate academic discipline.

As discussed below, some authors believe that it is possible to identify shared intellectual features of the current mainstream economics (at least in the United States or England, I would add). What they provide is not a general concept of mainstream economics, but a concept of the mainstream of *a particular period*—namely, the *current* one. As long as the identified characteristics have prestige and influence, their approach may be combined with the sociological concept.

Even though, by definition, it is always prestigious and influential, mainstream economics changes over time, making the task of identifying its core ideas more difficult. One reason for it to change is that individuals who have been accepted as practitioners of mainstream economics or even as members of the elite of the profession may change their minds. If they do so while keeping enough prestige to continue being considered part of the mainstream, the set of ideas characterizing mainstream economics also changes. This is facilitated by the fact that prestige is an attribute not only of ideas but also of people. Some members of the elite, in particular, may manage to transfer part of their previously accumulated prestige to their new ideas.

In the twentieth century, the case of John Maynard Keynes illustrates this well. He studied at the University of Cambridge and was brought up in the neoclassical tradition by Alfred Marshall and others, got a job at that prestigious university, became editor of the *Economic Journal,* and then later in his life rebelled against the dominant ideas of his time. The prestige Keynes accumulated before publishing *The General Theory* (1936) surely helped the acceptance of some of his new ideas or at least provided an incentive to those who eventually combined these ideas with the previous conventional wisdom.[5]

More recently, a good example could be a former winner of the Nobel Prize (actually, the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel), the most prestigious distinction that can be bestowed upon an economist since 1969. Colander, Holt, and Rosser (2004, p. 489) rightly use Kenneth Arrow as an example of an elite economist who not only is open-minded but also has criticized theories to which he had previously contributed. Among other Nobel laureates, I would highlight the case of Douglass North, who has been pushing the frontiers of mainstream economics by defending ideas that were excluded until recently. Only time will tell, however, if his new ideas will become accepted more broadly in prestigious circles. There have been cases of former Nobel awardees who have changed their minds, but failed to convince their fellows inside the mainstream of the profession.[6] Thus, it is not always easy to consistently refer to both ideas and people as having prestige and being part of mainstream economics. Ideas must be

[5] The fate of Michal Kalecki, who was Polish and influenced by Marx, offers an interesting contrast to Keynes's bigger (although partial) success.

[6] John Hicks is a case in point. In the last years of his life, Hicks rejected a good deal of his earlier contributions to general equilibrium theory (including the IS-LM model) and to welfare economics, becoming closer to Post Keynesian economics (e.g., Hicks, 1980–81).

seen as the main factor, because (1) an individual may simultaneously hold some ideas that are accepted in prestigious circles and others that are not, or (2) an individual may have prestige due to ideas that he or she no longer holds.

At any rate, Nobel Prize winners are a special case. They have already reached the summit of the profession and therefore are much less subject to sanctions. In contrast, those who have not yet won the Nobel Prize (or any prestigious award, for that matter) may not wish to jeopardize their perceived chances by deviating too much from the current mainstream of economics.[7]

Applying a sociological concept of mainstream economics to the current period

There have been examples of historical situations in which different schools of economic thought coexisted within mainstream economics. In the twentieth century, the interwar period in the United States is one such example of variety or pluralism (see, e.g., Morgan and Rutherford, 1998), which already implies that neoclassical economics was not synonymous with the mainstream. The current period is another example.

Diversity

Applying the sociological concept of mainstream economics to the period from the 1990s to the present decade shows that the mainstream is a diverse body of thought, formed by a neoclassical subset as well as other approaches.

Although the dominance of neoclassical economics has weakened, this school is still an important part of mainstream economics. This is true with the variety of sociological concept of mainstream economics proposed by Colander, Holt, and Rosser; it can be argued even more forcefully with the variety that I have defended above and that allows more room in the mainstream for the kind of economics that is taught at the undergraduate level in prestigious institutions. As Davis noted, "neoclassicism remains solidly embedded in economics instruction"

[7] Excessive deviation may have been the reason for not receiving the prize in the case of Joan Robinson, for example. In contrast, adopting a critical stance regarding policy issues (as distinct from academic ones) did not prevent Joseph Stiglitz from receiving his Nobel Prize. There are also some authors who have won the Nobel Prize for ideas in which they no longer believed with the same intensity—the names Gunnar Myrdal and Friedrich Hayek come to mind.

(2006, p. 4). One can add that this applies to graduate instruction and even more so to undergraduate instruction.

Among the approaches comprising nonneoclassical mainstream economics nowadays, behavioral economics is a good example with which to begin. Herbert Simon was awarded the Nobel Prize in 1978, but his influence could be said to have been rather limited, at least until recently. Things had changed by 2002, when psychologist Daniel Kahneman won the Nobel Prize (for work mostly done with his coauthor Amos Tversky, who would certainly have shared the prize had he not died in 1996). In 2001, the year before Kahneman's Nobel, behavioral economist Mathew Rabin had won the John Bates Clark Medal (a very prestigious biannual award given by the American Economic Association to American economists under the age of 40, many of whose winners have ended up being awarded the Nobel Prize later in their lives).[8] A significant part of behavioral economics has gained recognition for its criticism of neoclassical economics, at least as a *descriptive* theory centered on utility maximization.[9]

Kahneman shared the 2002 Nobel Prize with Vernon Smith, a leading exponent of another approach—experimental economics. Some of the results of experimental economics are also meant to contradict utility maximization. In this sense, there is an intersection with behavioral economics.

Some parts of the new institutional economics similarly reject the neoclassical hypothesis of utility maximization and in some cases manage to have a good deal of prestige. North's name has already been cited. In part, Oliver Williamson's version of transactions cost economics also fits here.

Another important approach that has become part of mainstream economics while relaxing the assumption of utility maximization is evo-

[8] In his autobiography, Kahneman (2002) uses Rabin's story to illustrate the changing place of behavioral economics in the field of economics in the 1980s and 1990s. According to Kahneman, when Rabin was hired at the University of California at Berkeley early in his career and decided to study psychology, some colleagues suspected that he was jeopardizing his future. Of course the John Bates Clark Medal proved the decision right.

[9] Things are different regarding the *normative* status of neoclassical theory, which, at least in the case of situations of risk, is not questioned by Kahneman and Tversky's famous 1979 article on prospect theory. Incidentally, this is one of the most cited articles ever to have been published in *Econometrica,* which, in turn, is one of the most prestigious journals in economics.

lutionary game theory. Unlike classical game theory, this evolutionary variety assumes some form of bounded rationality and allows agents to make mistakes or experiment with suboptimal strategies. This includes the segment of evolutionary game theory that deals with institutions or conventions and can be said to intersect with the new institutional economics. A prominent representative of this segment is the work of H. Peyton Young.

Part of evolutionary game theory is related to a broader perspective, based on the application of the complexity theory to economics, most notably in research done under the auspices of the Santa Fe Institute. In addition to Young, one could mention W. Brian Arthur and Samuel Bowles among the exponents of this view.

Also noteworthy is a set of approaches that criticize the standard version of expected utility theory and propose some formal decision-theoretic alternative to it. Some of these approaches relax one or more axioms of the standard version in order to generalize expected utility theory, while still adopting the idea of utility maximization; others are not based on utility maximization. In either case, Knightian risk or Savage's weak notion of uncertainty is abandoned in favor of what is often called Knightian uncertainty and should be more specifically called ambiguity, in most if not all of these cases. Articles along these lines have been published in very prestigious journals since the late 1980s. Interestingly, many of these articles cite, as forerunners of the proposed approach, two authors whose views on uncertainty used to be approvingly mentioned only in heterodox circles—Frank Knight and John Maynard Keynes.

Commonality

By definition, all schools of thought or approaches within mainstream economics at any given period have in common a great deal of prestige and influence. For some particular period, it may be that this prestige and influence are due to one or more characteristics shared by all the schools or approaches belonging to the mainstream. This might not have been the case of the interwar period in the twentieth century in the United States, but what about *contemporary* mainstream economics? As indicated above, some authors have attempted to identify intellectual features common to every subset of mainstream economics. They do not always make it explicit that they are trying to characterize the mainstream or the heterodoxy of a particular period, most often the present. Also, they do not always make it clear that the common feature(s) is (are) responsible for prestige and influence.

Strong emphasis on mathematical formalization

Perhaps the least controversial feature that one can identify as being common to all approaches belonging to current mainstream economics is a strong emphasis on mathematical formalization. (I refer to *mathematical* formalization because "formal"—in logic, for example—does not need to mean the same as "mathematical," so that formalization is not necessarily the same as mathematization.) By this strong emphasis, I mean, very broadly, an acceptance of the belief that academic work in economics must employ formal, mathematical models (which many economists simply call models) or structures, if it is to be rigorous.[10] In turn, this belief is compatible with more than one conception of rigor, as long as mathematics is used, be it in abstract theoretical constructs or in applied ones, such as those used in econometrics.

This belief about mathematical formalization is an intellectual feature, but it is not explicitly a set of ideas about any economy or economic reality; it is a (methodological) set of ideas about economics. Every set of ideas that has a great deal of prestige among economists is part of mainstream economics, by definition, but in this particular case, one is referring to ideas that, in addition to being methodological, have probably been adopted in part with prestige in view.[11]

Some authors label this belief as formalism or as a formalist methodology (e.g., Blaug, 1994, p. 131). In this general sense, formalism is not the same as (mathematical) formalization, but a special emphasis on the latter. Even apart from this distinction, the term *formalism* has, however, been given different meanings and may therefore lead to confusion. Possibly most important for economists is the distinction between this general sense and a narrower one, according to which formalism is one among other approaches and conceptions of rigor within mathematics; more specifically, it is an approach and a conception of rigor that calls for the

[10] There may be mainstream authors who do not actually believe this is true but merely agree to practice economics according to this precept. I should explain that I do not refer only to models (but also to structures or something like that) because some mathematical economists are not concerned with building models that represent an economy. Thus, Weintraub refers to a "distinction between 'modelers' (or 'applied economists') and 'theorists'" (2002, p. 70; see also p. 121 on Gérard Debreu as an example of the latter).

[11] Donald Katzner (2003, pp. 564–565) suggested that the desire for scientific respectability may have been one of the motivations behind the mathematization of economics.

axiomatization of mathematics. A strong defense of this formalism was made by the German mathematician David Hilbert in the early twentieth century. One version of this view came to economics in the 1940s, as documented by Mirowski (2002, pp. 390–394) and Weintraub (2002, ch. 2). These and other authors refer to it as Bourbakism, in reference to the work of a group of French mathematicians who wrote under the collective pseudonym of Nicolas Bourbaki and who influenced Gérard Debreu, one of the earliest proponents of this approach in economics. The term *Bourbakism* is useful to avoid the confusion created by the term *formalism*—in part due to the lack of awareness by several economists of its more specific meaning in twentieth-century mathematics, and also due to some controversy about the exact meaning of Hilbert's program (on the latter, see ibid., p. 90). On the other hand, a separate move toward axiomatization in economics had already been made by Johan von Neumann. As a somewhat more general and accessible label, I would suggest *axiomatism,* to denote a view that is favorable to axiomatization and can exist in radical or moderate variants.

In combination with either the broad or the narrow sense just mentioned, the term *formalism* may be used normatively, in particular by those who consider the emphasis on formalization, or on a particular type thereof, as excessive. It must be borne in mind, however, that some authors may distinguish between formalism and excessive formalism. More generally, another complicating factor in this debate on mathematization, formalism, and the like is the changing notion of rigor in mathematics over time, from rigor as based on empirical observation to rigor as based on axioms, according to Weintraub (ibid., pp. 17, 71, 100). Applying this distinction to modern economics, Weintraub finds these two different notions of rigor in econometrics (or applied economics) and in mathematical economics, respectively.

Regardless of the label that designates it, the emphasis on mathematical formalization has been noted by several authors, including a few dissatisfied mainstream economists. Some of these authors (e.g., Backhouse, 2000, pp. 35–39; Colander et al., 2004, p. 493) have seen it as *the* distinctive trace of modern mainstream economics, but possibly none with more emphasis than Lawson (2006; see also 2003, ch. 1). He identifies "the mathematising inclination" as "an essential distinguishing feature of the mainstream project of the last fifty years or more," and not only of the post-1990 period (Lawson, 2006, p. 488). In its most general sense, this is, in my opinion, synonymous with "an insistence on mathematical modelling" (ibid., p. 495) and, if one also interprets formalism in the above-mentioned general sense, with "the view that formalistic methods are everywhere and always appropriate" (ibid., p. 492). Several other authors refer to the use of mathematics in economics in this general way. Lawson (ibid.) cites a few eminent economists on this, although he goes beyond this general sense and often describes formalization in mainstream economics in a more restrictive way than do others, including myself.[12]

The identification of a strong emphasis on mathematical formalization—in the general sense—as a unifying trait of mainstream economics is not, however, completely free of controversy. Someone may point out that there are some economists who have not developed mathematical models but have managed to acquire a great deal of prestige and influence in the recent decades. Nevertheless, the exceptions, if any, are quite rare. Given their importance, two Nobel Prize winners and institutional economists are worth mentioning here. Ronald Coase is one of them. On the other hand, Coase had a seminal idea—on transactions costs—that did find its way into formal models, even though he has opposed the lack of realism of recent formal theorizing (see ibid., p. 490, for a reference). Douglass North is the other, but, as stated in the press release of the Royal Swedish Academy of Sciences, he shared the Nobel Prize with Robert Fogel "for having renewed research in economic history by applying economic theory and quantitative methods in order to explain economic and institutional change," both authors being acclaimed as pioneers of cliometrics (see http://nobelprize.org/nobel_prizes/economics/laureates/1993/press.html). North has thus contributed to bringing economic history and institutional economics closer to standards accepted by mainstream economists. In North's case, there is a further complication: his more recent work may in part be seen as different not only from neoclassical economics (from which he was already partly departing in his 1990 book) but also from nonneoclassical formal approaches within the current mainstream. For example, he has incorporated a notion of

[12] Lawson refers to a particular kind of mathematization, namely, "the *formalistic-deductive* framework that mainstream economists everywhere adopt," and describes modern mainstream economics as "just the reliance on *certain forms* of mathematical (*deductivist*) method," on "*certain* mathematical deductive forms of reasoning" (Lawson, 2006, p. 489, emphases added). As discussed above, however, mathematical formalization does not require the axiomatic method of many mathematical economists (which others may call deductivism, for its emphasis on deduction from axioms). Arguably, neither does it require deductivism in Lawson's sense, which refers to closed systems and event regularities (ibid., pp. 493–494). For a defense of formalization by an author who emphasizes fundamental uncertainty, see Katzner (1991).

fundamental uncertainty.[13] As argued above, however, it is still too early to tell if his new ideas will become accepted more broadly in prestigious circles, even if the prestige of the Nobel Prize makes it less difficult for him to defend them.[14]

Another potential problem with highlighting the strong emphasis on mathematical formalization is the fact that there are heterodox economists who share the same view on the use of mathematics.[15] This emphasis may, therefore, fail to distinguish mainstream from heterodox economics, even if it is a unifying feature of the former.

Other shared features?

It is not at all easy to find any other intellectual feature common to all varieties of mainstream economics. A possible candidate is methodological individualism, but there are some complications. One of them is the variety of meanings and versions of methodological individualism, only some of which are extreme to the point of proposing that individuals be the only basic unit of analysis. Another is the difficulty of actually practicing such an extreme form of methodological individualism when doing economics: some institutions must be taken as given and temporally previous to the present generations of individuals, instead of explained by the behavior of these individuals (Hodgson, 2004, ch. 2). In light of these complications, the possible common feature of mainstream economics should be more specifically described as a defense of methodological individualism at least in discourse or as a refusal to allow institutions, culture, and the like to have a fundamental influence on individuals.

This may indeed be an attribute shared by most of the nonneoclassical approaches that have managed to conquer their place within mainstream economics. Regarding behavioral economics, for instance, sociologist

[13] Readers of this journal will be interested in North's 2005 book, which has a chapter entitled "Uncertainty in a Non-Ergodic World," where he approvingly cites Davidson (1991) on uncertainty.

[14] It is also interesting to note that, thanks to the prestige amassed as one of the main contributors to the axiomatization of economics and as a Nobel Prize winner, Kenneth Arrow can afford to make the following statement: "My general sense of beauty has shifted with time. . . . I am more interested in the struggle for knowledge than in elegant systematization. Simple symmetries are not as satisfying as they were, and I look much more for a sense of openness, of incompleteness and stretching out toward an unknown, than for closed form" (Arrow, 1992, pp. 46, 50, cited by Augier, 2003, p. 112, n. 1).

[15] I am not referring to those economists who, as Lawson (2003, p. 6) notes, sometimes use formal techniques but do not reduce economic method to this.

Mark Granovetter (1992, p. 4) noted, in a perspicacious assessment made several years before Kahneman was awarded the Nobel Prize, that (1) some economists had been resorting to the psychological literature to revise the standard economic model of decision making along more realistic lines and (2) this "psychological revisionism" was having a certain success because it allowed mainstream economists to keep their atomistic treatment of economic actors.

However, here, too, complications arise: there have been exceptions—or at least things may be beginning to change. Douglass North must be mentioned again, as he has acknowledged the fundamental cognitive role of "shared mental models" (see Dequech, 2006, for further discussion and references). Moreover, together with Jack Knight, North has criticized an individualistic approach to cognition and rationality, as exemplified by standard psychological research on cognition and decision making, including Kahneman and Tversky's work (Knight and North, 1997, section III). A similar stance on these issues was taken in his recent work by a younger but also eminent new institutional economist, Avner Greif (2006, pp. 130–131).[16]

Another candidate for a shared characteristic of present-day mainstream economics is the neglect of fundamental uncertainty. This neglect is not exclusive to neoclassical economics, but seems to mark the nonneoclassical parts of the current mainstream as well. Although this is a negative feature, it is associated with a certain conception of economic reality. Moreover, it also involves some controversies—in this case, regarding the meaning of complexity, nonergodicity, and so on. Some proponents of the complexity approach, in particular, embrace a notion of fundamental uncertainty, but this does not seem to be the part of that approach which has been admitted into the mainstream.

Orthodox economics

In the case of orthodox economics, it is enough to simply quote the concept provided by Colander, Holt, and Rosser: "In our view *orthodox* is primarily an intellectual category [as distinct from a sociological one]. . . .

[16] Lawson thus is right when claiming that "it is not obvious" that an assumption of individualism is "ultimately essential to the mainstream position" (2006, p. 488), although I do not necessarily agree with his reasons for claiming so. He refers to the possible need of considering interdependence and theorizing in terms of groups with collectively coherent behavior. I would argue that this may not require abandoning methodological individualism any more than do other features of mainstream economics (as game theory has shown in the case of interdependence).

Orthodox generally refers to what historians of economic thought have classified as the most recent dominant 'school of thought'" (2004, p. 490). Although the reference to domination implies a sociological aspect, it is a particular set of ideas that defines a school of thought.

Applying the concept of orthodox economics to the current period

I also agree with Colander, Holt, and Rosser that the orthodoxy today is represented by neoclassical economics, but admit that the latter is a more controversial expression.

It must also be acknowledged that not everyone (1) is aware of the existence of a nonneoclassical segment of mainstream economics, (2) agrees with the thesis that there is such a thing, or (3) accepts the concepts adopted here. Some authors thus use the terms *orthodox* and *mainstream* interchangeably.[17]

Heterodox economics

Among the terms considered here, heterodox economics is possibly the most difficult to define. One possible approach would be to define heterodox economics negatively, as that which it is not—that is, as that which is different from something else. Another approach would be to define heterodox economics positively, on the basis of features other than, or in addition to, a set of differences in relation to another category. Heterodox would still be something different from orthodox, but not defined exclusively in these terms; the differences could be seen in part as a consequence of the definition, rather than being the sole basis of the definition.

It is especially in relation to mainstream economics that the concept of heterodox economics may become complicated and controversial, if mainstream economics is not taken to be synonymous with orthodox economics. The tricky question is the following: How does one classify that part of mainstream economics that one allows to be different from

[17] See, for example, Lawson (2006, p. 486). The reason seems to be that, for Lawson, "neoclassical economics" is "a category rarely defined, and always misleading" (ibid., p. 491). By stating that "institutional economics is being incorporated within orthodoxy," Williamson (2000, p. 596) seems to be using the term *orthodoxy* to refer to mainstream economics, because he does not usually use the expression *institutional economics* to describe the neoclassical segment of the new institutional economics. In my terms, only this neoclassical segment could have, and has, become part of the current orthodoxy, while the nonneoclassical segment of the new institutional economics can, and in part has, become part of mainstream economics.

the orthodoxy? Is that also a part of heterodox economics? As a result, is part of heterodox economics mainstream?

A negative concept of heterodox economics

Within the negative approach, there are two main options: to define heterodox economics in contrast with orthodox economics or in contrast with mainstream economics. If one equates mainstream with orthodox economics, these two options are obviously equivalent and therefore not mutually exclusive. In contrast, if one does not equate mainstream with orthodox economics, and takes the negative approach to conceptualizing heterodox economics, one can consistently define heterodox economics in opposition either to the orthodoxy or to mainstream economics, but in general not to both. The first alternative allows at least part of mainstream economics to be heterodox, and part of heterodox economics to be mainstream, while the second does not.

Contrasting *heterodox* and *orthodox* is defendable for etymological reasons, as these two terms share a common Greek root. Indeed, I suppose that everybody familiar with these words understands heterodox as something that is not orthodox. This does not imply, however, that one should *define* heterodox in these terms. For some people, this may be all that it means. For others, such as those who define heterodox economics in opposition to the mainstream, it is not.

The intellectual negative concept: heterodox versus orthodox economics

If one defines orthodox on the basis of intellectual criteria (referring to theoretical, methodological, or political ideas that are common to the most recent dominant school of thought), then defining heterodox economics in opposition to the orthodoxy logically implies adopting intellectual criteria as well. Heterodox economics would thus be defined by its divergence from at least some of the main orthodox ideas. Unlike orthodox economics, heterodox economics as an intellectual category does not necessarily have shared methodological, theoretical, or political features that are accepted by every dissenter from the orthodoxy at any particular point in time.

The sociological negative concept: heterodox versus mainstream economics

If one defines mainstream economics on the basis of sociological criteria, then defining heterodox economics in opposition to the mainstream logically implies adopting sociological criteria to define heterodox economics as well. Heterodox economics would therefore be defined by its lesser prestige and influence. Perhaps it would be less confusing (but also less elegant) to call it nonmainstream economics. Like mainstream economics, its heterodox counterpart may or may not have shared methodological, theoretical, or political features at any particular point in time. When they exist, these shared ideas may also change over time, as some of them may be incorporated into the mainstream, while ideas that have enjoyed prestige and influence for some time may be expelled from the mainstream paradise.

This way of defining heterodox economics implies that heterodox and orthodox economics are different from one another. This is, however, a consequence of (1) the sociological negative concept of heterodox economics, which opposes heterodox and mainstream economics, and (2) the inclusion of orthodox economics within the mainstream.

At this point, a few comments on Colander, Holt, and Rosser are in order, because they defend a variety of a sociological concept of mainstream economics, as seen above. When it comes to heterodox economics, they do not exactly embrace a sociological concept such as the one considered in the previous paragraphs. Colander, Holt, and Rosser start with intellectual criteria and then add sociological ones, but they also refer to how other people use the label *heterodox,* without making their own concept totally explicit. In addition, although their sociological concept of mainstream economics is general, their discussion of heterodox economics does not clearly separate temporally general aspects from temporally specific ones.

Colander, Holt, and Rosser begin by stating that "the term 'heterodox' . . . is usually defined in reference to orthodox, meaning to be 'against orthodox'" (2004, p. 491). They seem to agree with this (general) intellectual criterion when they maintain—implicitly referring to the current period—that "beyond this rejection of the orthodoxy there is no single unifying element that we can discern that characterizes heterodox economics" (ibid., p. 492). Colander, Holt, and Rosser imply, however, that this is not all that there is to the concept used by economists who call themselves heterodox, because "heterodoxy also has a sociological aspect. A self-identified heterodox economist has also defined his or her self outside the mainstream" (ibid., p. 491). Soon afterward—and again implicitly referring to the current period—they assert that "[s]ince many mainstream economists also do not accept important aspects of the orthodoxy, the additional feature that determines a heterodox economist is social: heterodox economists refuse to work within the framework of mainstream economics, or their ideas are not welcome by the mainstream" (ibid., p. 491).

A potential empirical problem with their characterization of heterodox economics is that it may fail descriptively, to the extent that (1) some economists who identify themselves as heterodox may recognize the intellectual diversity of mainstream economics (partly as a result of Colander, Holt, and Rosser's contribution) and thus may not oppose the mainstream as a whole[18] or (2) some mainstream economists may call their ideas or themselves heterodox. Defining a word in terms of how people use it is troublesome when different people do not use it in the same way.

In addition, when discussing the edge of economics, Colander, Holt, and Rosser describe it as "that part of mainstream economics that is critical of orthodoxy, and that part of heterodox economics that is taken seriously by the elite of the profession" (ibid., p. 492). If this is not in contradiction with the claim that all heterodox economics is rejected by (or rejects) the mainstream, then being taken seriously by the elite would not be sufficient for something to be part of the mainstream. In turn, this conclusion may not be easy to reconcile with the authors' earlier description of mainstream economics as the ideas that "the elite finds acceptable" and "worth working on" (ibid., p. 490).

A positive concept of heterodox economics

Adopting the positive approach depends on identifying something that all strands of heterodox economics have in common, apart from their common opposition to, or differences with, the orthodoxy or the mainstream. From the perspective of the positive approach, therefore, heterodox economics must be an intellectual category.

Someone might, in principle, maintain that this positive concept of heterodox economics is also general, in the sense of being applicable to any period of the history of economic thought. The problem, however, is that, in some cases, the result of the application is an empty set. This occurs when one concludes that it is impossible to find any significant

[18] Because I consider myself heterodox, I may serve as a counterexample, as the present paper indicates. In previous works, I had already noticed that the mainstream is diverse when referring, for instance, to (1) the increasing number of references to Knight and Keynes in the articles on uncertainty published in prestigious journals in recent decades, (2) the growing incorporation of the idea of bounded rationality into the mainstream of the profession, and (3) the partial convergence between some prestigious exponents of new institutional economics (such as North) and the "original" institutionalists. It would be interesting to learn how Colander, Holt, and Rosser classify themselves.

ideas common to every economist or approach that does not belong to the orthodoxy or the mainstream. In such cases, one would be forced to adopt the purely negative approach.

Applying the concept of heterodox economics to the current period

A negative characterization of current heterodox economics

Applying the intellectual negative concept: heterodox versus orthodox economics

What would be the result if one applied to the current period the negative concept of heterodox economics that opposes it to the orthodoxy (previous section)? It was argued above that the current orthodoxy is neoclassical economics. Current heterodox economics would consist, therefore, of all the schools of thought and approaches that differ from neoclassical economics. This is how many economists (perhaps especially outside the mainstream) think of heterodox economics. This view would mean, among other things, that some elements of (sociologically defined) mainstream economics are part of the current heterodoxy.

Applying the sociological negative concept: heterodox versus mainstream economics

If one characterizes heterodox economics as sociologically distinct from the mainstream—that is, as having less prestige and influence (previous section)—the set of heterodox economics would be smaller than in the preceding case. In the current period, it would not include some prestigious and influential nonneoclassical approaches (such as those mentioned above when describing the diversity of current mainstream economics).

Interestingly, some ideas and approaches to economic issues that are excluded from current mainstream economics on this sociological concept do, nevertheless, have a good deal of prestige and influence in academic circles, outside economics departments. This is probably especially true of what happens in sociology. Since the mid-1980s, there has been a resurgence of sociological works applied to economic issues, through what has been called the new economic sociology. A lot of this research is carried in prestigious departments of sociology, published in the most famous and traditional sociological journals, funded by important research foundations, and so on. A significant part of this work is compatible with, and sometimes openly sympathetic to, some heterodox economics, perhaps most notably some varieties of institutional economics, such as the "original" institutionalism in the Veblen–Commons tradition, the French economics of conventions, and the Austrian wing of the new institutionalism. To put it another way, part of heterodox economics is, intellectually, part of mainstream (economic) sociology.

A positive characterization of current heterodox economics

It was argued above that applying a positive concept of heterodox economics may, in some cases, result in an empty set. For many scholars with whom I tend to concur, the current period seems to be one of these cases in which there are no significant ideas common to *all* heterodox approaches or schools of thought.

There are, however, authors who argue to the contrary. One of the most interesting contributions along these lines is that of Lawson (2006). He characterizes mainstream economics by a mathematizing inclination, as mentioned above, and by what he sees as the ontological underpinnings of this inclination. In turn, for Lawson, heterodox economics stands opposed to mainstream economics,[19] but this is not all. Lawson contends that the reasons for this opposition lead to some unity and coherence within heterodox economics. He begins by arguing that "it is an appraisal that mathematical methods are mostly inappropriate to social analysis that ultimately underpins the heterodox opposition. In short, . . . *the essence of the heterodox opposition is ontological in nature,*" even if this ontological orientation is often only implicit (ibid., p. 493, emphasis in original). More specifically and more strongly, he believes that heterodox economists are committed to "an underlying ontology of openness, process and internal-relationality" (ibid., pp. 497–498; see pp. 495–497 for a brief presentation of this ontology and Lawson 1997 and 2003 for an elaboration and defense). This ontology presumably systematizes "the implicit preconceptions of *the various heterodox traditions*" (Lawson, 2006, p. 497, emphasis added).

Lawson does not merely assert that each heterodox strand emphasizes one aspect of such an ontology and thereby opposes mainstream economics. He seems to make the much stronger claim that all heterodox strands share *the same view of social reality as open, processual, and*

[19] Recall that Lawson does not consider "neoclassical economics" a useful category and, because of his focus on method, uses the terms *mainstream* and *orthodox* interchangeably.

internally related, even if only implicitly. This does amount to a positive characterization of current heterodox economics.

Whether this is a tenable characterization is a matter for further investigation and debate. In particular, it is controversial whether all heterodox strands really implicitly treat social reality as open in Lawson's sense.

Does this apply, for example, to neo-Ricardianism (or Sraffian economics)? Stephen Pratten, a member of the Cambridge critical realist group led by Lawson, has criticized neo-Ricardianism for its adherence to a method that Pratten sees as relying on a closed ontology and as deductivist, in Lawson's sense (Pratten, 1996). This is the same sort of criticism that Lawson directs against mainstream economics (see Pratten, 2004). For the sake of simplifying and organizing the assessment of coherence within Post Keynesian economics, Lawson (2003, p. 323, n. 7) does not consider Sraffa, presumably leaving neo-Ricardianism for future discussion. According to Lawson, openness implies "fundamental uncertainty" (ibid., pp. 171–172) and thus the Post Keynesian emphasis on fundamental uncertainty "is easily explained if openness is a presupposition" (2006, p. 497), but it should be noted that Post Keynesians and neo-Ricardians have disagreed on this issue, with several of the former accusing the latter of neglecting fundamental uncertainty (and, as a consequence, of presumably failing to understand the role of money in capitalist economies).[20]

And what about Marxism? Do all strands of Marxism embrace a view of social reality as open? Some do, but this cannot be the case of all strands, to the extent, if any, that there still exist varieties of Marxism that adopt, for example, a teleological treatment of historical evolution.[21] Such a treatment, in which the advent of communism often appears as a predetermined end of the historical process, does not seem to be based on an ontological view of social reality as open. As long as there are surviving proponents of these varieties of Marxism in the world, they are exceptions to Lawson's positive characterization of heterodox economics.

[20] Indeed, this seems to be a main reason neo-Ricardianism is often considered as an approach that is separate from, rather than a subset of, Post Keynesianism (see, however, Lavoie, 1992, pp. 12–13, for an attempt at conciliation). Perhaps particularly relevant for the discussion of the implicit ontology of neo-Ricardianism is its notion of long-run equilibria as gravity centers. Also relevant is the relation between openness and fundamental uncertainty, in my sense of the term, which may not be exactly the same as Lawson's.

[21] Critics have variously referred to this strand as "vulgar," "determinist," "orthodox," or "classical" Marxism.

Lawson or someone else might argue that neo-Ricardianism or some varieties of Marxism or still whatever other approach that does not adopt at least implicitly a certain ontology should be considered as part of mainstream economics, not of the heterodoxy. Whatever the merits of this argument, it is not compatible with a sociological concept of mainstream economics, which excludes approaches that are not prestigious and influential. In addition, the argument would contradict the current usage of the term *heterodox* by both defenders and critics of those approaches.

Concluding remarks

The present paper has specified, compared, and contrasted the concepts of neoclassical, mainstream, orthodox, and heterodox economics. It also emphasized the importance of separating the concepts that are temporally more general from the more specific ones. The more general concepts can be applied to different historical periods. Regarding the application of these general concepts, the paper has focused on the current period.

Neoclassical economics is characterized by the combination of (1) the emphasis on rationality in the form of utility maximization, (2) the emphasis on equilibrium or equilibria, and (3) the neglect of strong kinds of uncertainty and particularly of fundamental uncertainty. The concept of mainstream economics defended here is sociological, based on prestige and influence. It is similar to the one put forward by Colander, Holt, and Rosser (2004), but more inclusive about the ideas that are taught at the undergraduate level in prestigious universities and colleges, as well as about the supporters of these ideas in these and other, less prestigious places. In contrast, orthodox economics is mainly an intellectual category, and here I have followed Colander, Holt, and Rosser closely, referring to the orthodoxy as the most recent dominant school of thought.

The sociological concept of mainstream economics is temporally very general. It is also compatible with identifying the intellectual contents of the mainstream of a particular period. When this sociological concept is applied to the current period, the result is not restricted to neoclassical economics but it also includes other approaches that are at least partly critical of it. This clearly reveals diversity within the current mainstream. On the other hand, finding commonalities within it is more controversial. The best candidate for a unifying feature is a strong emphasis on mathematical formalization.

Orthodox economics is also a temporally general concept, and this category is currently represented by neoclassical economics.

"Heterodox economics" is arguably the most controversial of the concepts considered here. Different possibilities have been considered. One can define heterodox economics negatively, in opposition either to the orthodoxy or to the mainstream. The first alternative is based on intellectual criteria (the divergence from at least some of the main orthodox ideas), and the second on sociological ones (the lesser prestige and influence). Both alternatives within this negative approach have been chosen by different economists using the label *heterodox,* with the result that communication problems seem unavoidable at present. Another possibility would be to define heterodox economics positively, as an intellectual category that is not defined exclusively in opposition to orthodox. When applying this positive concept historically, the result may be an empty set. This may be the case of the present period. Although arguments to the contrary have been developed, they still need further elaboration and debate. Finding shared elements among all heterodox approaches may be even more difficult than among all subsets of mainstream economics.

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