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Introduction¹²

- 1 The recent global financial crisis has led to a debate about the limitations of current macroeconomic models. It has also sparked a debate about the limitations of the inherently stable micro founded models that are currently dominating modern macroeconomic research and have been used as analytical tools by many central banks (see Akerlof and Shiller, 2009). The international financial crisis is, as Reinert (2012, p.2) puts it, “the last in a series of economic calamities produced by a type of theory that converted the economics profession from a study of real world phenomena into what in the end became mathematized ideology”. Undoubtedly, this crisis has showed that mainstream economics was unprepared to deal with such an event and has seriously damaged the reputation of macroeconomic model building (see Beker, 2012).
- 2 Two main questions will be addressed in this paper. First, does the accepted methodology of neo-Classical economics provide an adequate basis for reconstructing structural econometrics? Hollis and Nell’s examination of the relationship between positivism and the methodology of neo-Classical economics will be at the core of the discussion. It will be argued that neo-Classical-based econometrics, which functions at the level of appearances and events, fails to develop any insight into deep structures. It interprets whatever it sees as individuals choosing with some degree of (perhaps bounded) rationality. It simply relates observables to one another, putting choices and actions together into equilibrium patterns.

- 3 The second question is to determine whether or not, and in which sense, a Hollis and Nell's (1975) framework can be considered as a "foundation" for a reconstruction of econometrics. (Here "foundation" refers to the "relationship between the economic theories or assumptions upon which econometricians base their models and the statistical methods they use to reach conclusions about the nature of the real world" (Swamy et al., 1985, p.4). Haavelmo's (1944) seminal paper positioned within the Hollis and Nell's (1975) framework is appealed to for methodological insights.
- 4 To put these two questions in historical perspective we recall the debate over the methodological foundations of structural econometrics (see Epstein, 1987). This was due in large part to a crisis of vision within neo-Classical economics (see Heilbroner and Milberg, 1995), ultimately deriving from an advocacy of a strong determinist model of explanation copied directly from physics - just when physics seemed to be repudiating such a model (see Mirowski, 1989)! The neo-Classical vision uses equations to describe the optimising behaviour of consumers and firms with the aim of predicting such behaviour and its consequences. Neo-Classicism takes the circumstances in which the behaviour occurs for granted (Hollis and Nell, 1975, p. 17). But this takes us into deep water where we must leave it for the moment.

Revisiting the Foundations of neo-Classical Economics in the light of Hollis and Nell

- 5 Hollis and Nell's (1975) book is both a philosophical critique of neo-Classical economics and an innovation in the field of economic methodology, capable of opening new horizons in econometric methodology and theory. It is an intriguing combination of philosophical arguments and economic analysis, of sound criticism of the foundations of neo-Classical economics. The philosophical vision of Hollis and Nell is an extension of Strawson's (1959) descriptive metaphysics and runs along Kantian lines.

Hollis and Nell's Methodological Framework

- 6 Philosophers and economists rarely find much common ground, and Hollis and Nell gave the seminar at the University of East Anglia, which fathered their book, as they put it, with more "curiosity than confidence". The book is a tribute to the hopes of Oxford P.P.E. School, through which both authors passed. Hollis has only 'hazy collections of genial hours with his economists tutors', but Nell is the author of several philosophical papers and has contributed much more than the economics in the book. The arguments of their book and of the work it builds on has been overlooked, avoided and never properly confronted by the mainstream textbook approach. A re-examination of the elements of Hollis and Nell gives rise to an alternative methodological framework.
- 7 Often being seen as history of thought, methodology has appeared to be of little relevance for contemporary economic theorists (Boland, 1982). By contrast, Hollis and Nell approach neo-Classical economics starting from Samuelson's (1947) Foundations, in which it is argued that constrained optimizing provides a unity of method in the neo-Classical treatment of many different questions.

- 8 Hollis and Nell question the traditional approach by focusing on the problems of the applicability of these “Samuelsonian” neo-Classical optimizing theories. Coherent theories, describing the behavior of “assumed” – thus imaginary – rational, optimizing agents. But what are the conditions for applying such theories to actual agents? The neo-Classical answer hinges on its view of rational individuals.
- 9 Hollis and Nell dissect the textbook combination of neo-Classicism and Positivism, so crucial to the defense of orthodox economics against now-familiar objections. Instead of turning to another fashionable philosophy of science, however, Hollis and Nell (1975) propose a rationalist theory of knowledge and contend that economic theory must be based on the conditions necessary for economic agents to reproduce themselves. As Allais (1997, p. 8) puts it:

whatever the economics considered, whether in the past or in the present, the whole human economic activity comes down to the search for, and the realization and distribution of surpluses according to fundamentally invariant processes.
- 10 Allais considers that in their essence all economic activities can be thought of as being concerned with the pursuit, realization and imputation of “distributable surplus”, that is, over and above what is necessary for reproduction of the agents and institutions. He argued that the surplus approach enables us to replace the unrealistic model of the market economy.
- 11 Somewhat surprisingly and independently, Hollis and Nell (1975) and Boland (1982)³ both use a “cross-sectional approach” to the understanding of neo-Classical economic theory. Taking a “cross-sectional approach” means that they look for the common theoretical themes in widely different ways of approaching economic analysis – i.e., the traditional neo-Classical approach and the surplus approach. This makes it possible to compare and contrast economic visions, and thus offer a fresh approach to understanding the crisis of modern economic theory.
- 12 Besides sharing the cross-sectional approach, Hollis and Nell and Boland express a common view of the foundations of neo-Classical economic methodology (in Boland’s words the “hidden agenda”), holding that it consists of two related but autonomous problems, namely, the “problem of induction” and the “explanatory problem of individualism”. By examining this “hidden agenda” of current neo-Classical economics, Hollis and Nell, and Boland offer a fresh approach to the understanding of both economic theory and methodology. Although there are some important distinctions between Hollis and Nell, and Boland, their central theme, which is the foundations of Neoclassicism, is common.

Re-reading Rational Economic Man

- 13 Hollis and Nell show that neo-Classical theories of economics are built upon the same foundation. I call this common foundation the “DNA structure” of neo-Classical economics. My concern here will be the identification of hidden items in the DNA structure of neo-Classical economics. Specifically, this DNA structure consists of the neo-Classical answers to two deeply rooted problems: the inductive problem and the explanatory problem of individualism. The central argument of Hollis and Nell’s book is straightforward. They argue that every neo-Classical research programme is designed:
 1. to be consistent with acceptable ways of dealing with the inductive problem (the laws of induction) and to adopt a general empiricism in the pursuit of knowledge, and

2. to provide a methodological individualist explanation of economic behaviour of the economy, that is, one that prescribes rational economic man to be posited as the exclusive locus of decision-making.
- 14 The common theme, then, the factor providing the solution to the problem of induction and making methodological individualist explanation possible, is “rational economic man” – the individual maximizing agent.
- 15 The discovery of the DNA structure in biology solved two major questions of inheritance: (1) how information is encoded in genes and (2) how genes are copied. The analogy here is that (1) induction concerns how economic information is encoded for use, and (2) the hypothesis of rational individuals tells us how it is used and passed on. The impetus for Watson and Crick (1953) was to find one model that would explain both biological behaviour and the chemical processes, whereas many other contenders tried to tackle the problem from either a purely chemical or purely biological perspective.
- 16 Two different perspectives are offered by Hollis and Nell on the role of methodology in neo-Classical economics. First, there is the actual methodology embodied in every neo-Classical theory or analysis: neo-Classical economists explain the behaviour of the decision-makers in the economy by an appeal to optimizing of some kind. Although the authors examine alternative views, they nevertheless recognize that this one view dominates, even to the point of explaining neo-Classical economists’ own behaviour in choosing a methodology! Second, the authors study the consequence of this dominance on the economic theorist’s conception of the individual decision-maker who is the object of economic studies.
- 17 What is important about this distinction is that there is always the possibility that the methodology practiced by neo-Classical economists is inconsistent with the methodology assumed to be the basis of the individual decision-making process. What is interesting is that even without explicit discussion of methodology there is, nevertheless, a remarkable consistency between these two perspectives. However, the authors argue that is one of the major shortcomings of neo-Classical economics. Indeed, they argue that the dominant neo-Classical view, both in practice and in its conception of rational decision-making, is based on an inadequate theory of knowledge. Although at first this may seem to be a criticism of neo-Classical theory, I shall also argue that the dominant view is not necessary to the neo-Classical conception of rational decision-making and hence neo-classical theory could be easily improved by a broader view of methodology.
- 18 To paraphrase Boland (1982) and Hollis and Nell (1975), every so-called “applied model” in neo-Classical economics is an attempt to model the essential idea of neo-Classical theory - independent individual maximization with dependent market equilibrium. Each model is thus essentially a test of the degree to which neo-Classical theory is relevant to the real world phenomena. This must be the case if neo-Classical theory is to be testable. Hollis and Nell, however, argued that assumptions are not enough to make the agenda workable: the “applicability” of the paradigm has to be demonstrated.
- 19 The neo-Classical conception of the rational decision-maker’s methodology is the primary topic of their book because it is there that the study of methodology can have a profound impact on the nature of specific neo-Classical theories. Before the authors can examine the theoretical issues of the appropriate conception of the decision-maker’s methodology, they developed a clear idea about the mainstream methodology embodied in neo-Classical economics.

The Foundations of Neo-classical Economics as Problems: What are we really looking for in this Pandora's Box?

- 20 The foundations of neo-Classicism (the unseen DNA structure of all neo-Classical research programs), consist of two related but autonomous methodological problems (namely the problem of induction and the explanatory problem of individualism) but they also argued that the neo-Classical answers to these problems are unsound, being based on a broadly positivist theory of knowledge that is also unsound.
- 21 The two problems are not independent, as the latter's existence depends on its support for the former (Boland, 1982, p. 32). It would be hard for most neo-Classical economists to give up their reliance on individualism - and their reliance on simple maximizing and rational choice - because that would deprive them of the means to deal with the problem of induction by relying on the convention of individual optimizing behaviour. Indeed, most neo-Classical economists take individual optimizing behaviour for granted and thus do not see any problems.

The Problem of Induction in Economics

- 22 The methodological approach of mathematics and logics is essentially logical-deductive. However, within the substantive sciences no discipline is as extremely deductive as neo-Classical economists. Physicists and biologists usually employ deductive reasoning. However, in contrast to economists, they do that in a limited way. Indeed, they cannot assume aprioristically that atoms or molecules are fully rational. They can develop theories that predict their behaviour only after inductively observing regularities in controlled experiments. Neo-Classical economists, in turn, take it as axiomatic that fully rational agents can, should and must behave in a maximizing way.
- 23 Induction and deduction have played a considerable role in the split between microeconomics and macroeconomics. Pereira and Lima (1996, p. 5) observed "the difference in methods imply different ways of viewing the same reality. When neo-Classical economics looks for a universal and invariant micro founding framework, it falls into an old positivist temptation: to find a unique logic for the whole economic system. From a relativistic standpoint, that we share, it is the notion of an invariant framework for micro founding macroeconomics that lacks sound logical foundations".
- 24 Induction and deduction constitute the philosophical theme of Hollis and Nell's book. Let us see how the induction problem has actually been handled in economics.
- 25 Boland (1982, p. 26) wrote:
- Even if methodologists today avoid promoting the hierarchical distinctions of Inductivism [hypotheses, theories, laws] the dominant methodological perspective is that the fundamental problem facing all economists is one of choosing the one 'best' theory or model. It is this choice problem which is the primary remnant of Inductivism.
- 26 Regarding the insoluble problem of induction, the author (1982, p. 13) notes:
- Nevertheless, what it is and how it is either 'solved' or circumvented is fundamental to understanding all contemporary methodological discussion.

- 27 Boland (1982, p. 14) argued that “the problem of induction is that of finding a general method of providing an inductive proof for anyone’s claim to empirical knowledge”. Boland (1982, p. 15) argued that “an argument of this form is said to be moving inductively from the truth of particulars to the truth of generals. If the induction problem is solved, the true laws or general theories of neo-Classical economics could then be said to be induced logically from particular observations”.
- 28 The working methodology of modern neo-Classical economics is optimizing, and this is held to license general statements. When such optimizing models are then applied, the result will be a general empirical claim which, of course, is a form of inductivism. But, unfortunately, all too often several different optimizing models can be fitted to the same data – not to mention models that do not rest on optimizing. How are we to select the correct model?
- 29 The most commonly adopted methodological position, according to Boland, in effect tries to by-pass empiricism, and temporarily puts forward a pragmatic solution, conventionalism, hoping that practical justification of the conventions will be enough. Boland (1982, p. 17) reasoned that “since this problem is not solvable without an inductive logic, most methodological arguments in neo-Classical economics today are about the appropriate way to circumvent the problem of induction”. Unfortunately, this shift to a modified form of the induction problem has led to more complications than those raised by the original problem.
- 30 Boland (1982, pp. 17-18) argued that “the aim of the induction problem was a straightforward, objective, evidence-based proof of the absolute truth of any theory. Contrarily, the aim of the problem of conventions is a choice of the best theory according to conventional measures of acceptable truth”. What do those words mean? Boland (1982, p. 18) went on to argue that “without an inductive logic, there is no solution to the problem of conventions; moreover, there are many different measures to choose from, and the measure chosen may not necessarily involve inductive evidence”.
- 31 As to the Problem of Induction, this has mostly been shifted to the Problem of Conventionalism: “the problem of finding generally accepted criteria upon which to base any contingent, deductive proof of any claim to empirical knowledge” (Boland, 1982, p. 18). In practice, the generally accepted criteria have evolved into a form of normal science where the puzzles are concerned either with econometric models or mathematical models. In the first instance, the requirements of science are met by using data, with some talk about falsification, confirmation and the like. In the second instance the criteria run along the lines of simplicity, economy, elegance and other considerations of mathematics.
- 32 As an epistemological problem, induction calls for a solution from the logic of validation. A theory of knowledge need not explain how we discover causal laws but it must tell us how we know when we have found such a law. To argue that a hypothesis is rendered probable by being obtained from a theory that has previously proved fruitful is to generate a vicious regress (Hollis and Nell, 1975, p. 75).
- 33 As mentioned above, the traditional problem of induction arises within empiricist philosophy. It is appropriate to start with it, since the early econometricians tended to consider themselves empiricists, even positivists. Spanos (2010, p. 235) argued that “the initial optimism that was associated with the promise of the new statistical methods of

the Cowles Commission to significantly improve empirical modeling in economics became pessimism by the late 1960s". Morgan (1990, p. 1) notes that:

Econometrics was regarded by its first practitioners as a creative synthesis of theory and evidence, with which almost anything and everything could, it seems, be achieved: new economic laws might be discovered and new economic theories developed, as well as old laws measured and existing theories put to rest. This optimism was based on an extraordinary faith in quantitative techniques and the belief that econometrics bore the hallmarks of a genuinely scientific form of applied economics. In the first place, the econometric approach was not primarily an empirical one: econometricians firmly believed that economic theory played an essential part in finding out about the world. But to see how the world really worked, theory had to be applied; and their statistical evidence boasted all the right scientific credentials: the data were numerous, numerical and as near as possible objective. Finally, econometricians depended on an analytical method based on the latest advances in statistical techniques.

- 34 According to the empiricist view, good scientific practice is characterized first by the unprejudiced observation of facts, presented in the form of singular statements. From sets of these singular statements universal ones (i.e. hypotheses, laws or theories) are inferred inductively. And then, from these, singular statements of facts are again inferred. Thus the link runs from facts to theories and back to facts again for verification.
- 35 Hollis and Nell provide a sketch of empiricism, of which positivism is the "best worked-out variant", and contend that it is an indispensable background to standard introductory chapters on economic methodology. Empiricists reject the rationalist quest for necessity among truths and inevitability among events. In like manner, individualists reject the social definition of man formulated by medievalists and mercantilists and refurbished by Marx.
- 36 Hollis and Nell (1975, p.4) set out three crucial tenets of empiricism:
 1. Claims to knowledge of the world can be justified only by experience;
 2. Whatever is known by experience could have been otherwise;
 3. No statement about the objective world depends for its truth on whether it is believed.
- 37 Empiricist philosophy of science cannot allow the existence of any necessity about causal connections. Generalizations can be tested by observing whether suitable instances actually occur. There can be no basic difference in kind between causal laws and confirmed empirical generalizations, even if the title of law is reserved for generalizations especially broad, useful, elegant or suggestive. This may prompt the objection that the citing of causal laws is supposed to explain, whereas generalizations merely describe (Hollis and Nell, 1975, p. 5).
- 38 We turn now to positivism. The core of nineteenth-century positivism was integrated into a more forceful and elegant theory about the meaning and truth of statements: logical positivism. The advance of science became seen as the progressive determination of the truth or falsity of statements, since all claims to knowledge are claims to know whether a statement is true. While this may seem an artificial way of putting it, it cleared the deck for the introduction of the great engine of logical positivist epistemology, the analytic-synthetic distinction.
- 39 For a logical positivist, all cognitively meaningful statements are of two exclusive kinds, analytic or synthetic. Very roughly, the former are statements of language, the latter statements of fact. More formally, a true statement is analytic if it cannot be denied

without contradiction or if its truth arises from the meaning of its terms. It is synthetic, if there are possible circumstances in which it would be (or would have been) false (Hollis and Nell, 1975, p. 5).

- 40 The analytic-synthetic distinction provides a powerful tool to positivism – it was believed to “sweep away” all metaphysics and religion, for example - but it also reveals a serious weakness in empiricism. For if everything empirical “could have been otherwise”, Kantian reason seems to be the only way to know which of an infinite number of possible worlds we live in, in that some truths are both necessarily true and informative about our world (Hollis and Nell, 1975, p. 6), and these truths will rule out possibilities and provide direction to our investigations.
- 41 Though few empiricist or positivist philosophers think they have solved the induction/deduction problem, many appear to feel that they can by-pass it, and that it presents no serious problems for their work. After all, science “works”, as pragmatists would say. Nell and Errouaki (2013) argue that this view is mistaken; that the global or “neurotic” problem of induction *reveals a central weakness in empiricist or positivist philosophy*, and that this weakness emerges most clearly in the positivist account of scientific laws. They argue that in order to remedy this deficiency a re-examination of the concept of a scientific law is needed. This in turn must be based on an analysis of the concept of a scientific variable. The hypothetico-deductive model is wrong; the approach should be to justify *functional relations* in the mathematical sense. To show this calls for a complex argument based on Hollis and Nell, but extending their position considerably – which goes beyond the scope of this paper?

The Explanatory Problem of Individualism

- 42 Boland (1982, p. 28) argued that “methodological individualism is the view that allows only individuals to be decision-makers in any explanation of social phenomena”. So individuals must make decisions that can be generalized: in these circumstances the individual will always do such-and-such. The reason is that such-and-such is the rational thing to do. It is how any rational agent will behave. This then provides a basis for projecting the generalization – a justification for the convention that optimizing behaviour supports universal statements.
- 43 Within methodological individualism, explanations do not refer to non-individualist decision-makers such as institutions. Boland (1982, p. 28) argued that “from the viewpoint of methodology, we need to examine the reasons why methodological individualism is a main item on the neoclassical economics agenda”. Why is it claimed, in effect, that only individuals are real – that institutions are constructs out of the behaviour of individuals – and that only the rational decisions of individuals count as “true values” of decision variables?
- 44 There are more complications here than might at first appear. To paraphrase Boland (1982, pp. 28-9) the case is often presented as if there were a built-in dichotomy, allowing only two exclusive options – “methodological individualism” versus “methodological holism”. Given the “individualism-holism dichotomy”, the reasons for promoting methodological individualism could be simply negative – holism promotes a multiplicity of hard-to-authenticate entities. The social-philosophical basis of neo-Classical economics is dominated by the eighteenth-century anti-authoritarian rationalism that puts the individual decision-maker at the centre of the social universe. A rejection of

individualism would be tantamount to the advocacy of a denial of intellectual freedom. One can also, of course, point to obvious questions of ideology (Heilbroner, 1966), but as an explanation this only begs the question at a different level.

- 45 Other reasons exist for insisting that only individuals are basic, grounded in our perceptions. We can see and hear and touch other individuals; we cannot see, hear or touch institutions or the forces of history. It is perhaps a residue of materialism to insist that what is real is what is directly perceptible to the senses. What individuals do, however, when they are acting responsibly and with full knowledge, is what is in their best interests, rationally speaking. Of course, they often act foolishly or “without thinking”. But such actions are accidental; their true actions are rationally chosen. (Of course, it is just this sense of “rational” that is inconsistent with empiricism in general and the analytic-synthetic distinction in particular – the statements ruling out certain actions or classes of actions as “not rational” will not be analytic.)
- 46 For Hollis and Nell, the success of positivism in economics means the success of Utility. Man, illumined by the Enlightenment and anatomized by the utilitarians, was an individual bundle of desires (Hollis and Nell, 1975, p. 48). It is not a mere historical accident if positivism is so attractive.
- 47 Furthermore, to paraphrase Boland (1982, pp. 30-31) since non-individualist and non-natural exogenous variables are proscribed we argue that, according to Hollis and Nell, the specification of an appropriate conception of the relationship between “institutions” and “individuals” is the main epistemological obstacle that neo-Classicism theories of economic behaviour have to face. The existence of institutions poses an explanatory obstacle regardless of the prescriptions of psychologism.
- 48 Boland (1982, p. 31) argued that:
- on the one hand, social institutions are consequences of decisions made by one or more individuals. On the other hand, individual decision-makers are constrained by existing institutions - indeed, individuals are educated and socialized by institutions. If any given institution is the result of actions of individuals, can it ever be an exogenous variable? That is, how can institutions really be constraints, if they are shaped by individuals? But if institutions shape and limit the choices facing any individual, and shape the individual as well, are the individual's choices really free? If any institution is a creation of groups of individuals, can it have aims of its own or must it merely be a reflection of the aims of the individuals who created it?
- 49 He (1982, p. 31) went on to argue that “these questions are seldom discussed in the economics literature because the psychologism of Mill or Pareto is widely taken for granted”.
- 50 According to Boland (1982, p. 31):
- Methodological individualism alone leads to two primary methodological requirements. First, no institution can be left unexplained and, moreover, every institution must be explained in individualist terms. Second, institutions must always be responsive to the choices of every individual. The first requirement begs a fundamental methodological question about the existence of a set of acceptable givens which would constitute a successful explanation. The second raises the thorny question considered in Arrow's impossibility theorem.
- 51 Neo-Classical economic man as an individual is a descendant of utilitarian ancestors who is endowed with sovereignty. He is to be first studied in isolation from other individuals and from the institutions surrounding him. According to this view, the combination of

social atoms determines the behaviour of social molecules. On this view, economic man may be defined apart from his social setting. Individuals are “given”; they are not shaped and trained through social practices in any important sense that must be taken into account; they are endowed with knowledge and skills – it is not necessary to consider how these are passed along from generation to generation. The social setting, whatever it is, arises without difficulty from the combined choices of individuals; it is not necessary to consider how it is supported or maintained. Such individuals, pre-social utilitarians, seem to Hollis and Nell to be fictions of the enlightened liberal imagination. Yet these economic agents must be considered the essentially individual bearers of economic variables (Hollis and Nell, 1975, pp. 264-265).

- 52 It is commonly accepted that all explanations require some givens (e.g., some exogenous variables) whose specification is probably the most informative theoretical assertion in any theoretical model. Boland (1982, p. 32) argued that “for neoclassical economics, the presumption of psychologism conveniently restricts the list of acceptable givens. Given the psychologistic individualism, the irreducible givens are identified as the psychological states of the individuals in society”. This was commonly assumed in early neo-Classical theory.
- 53 Such versions of neo-Classicism were based on a reductive version of methodological individualism – specifically, one that identified the individuals with their exogenous psychological states (such as their given utility functions). The strict reliance on the reductive version – that is, on psychologistic individualism – always presents a general problem of explanation that we shall call the problem of simple psychologistic individualism: if everyone is governed by the same laws of psychology, then there is no psychological basis for individuality. To avoid psychologism – and to stick to observables, eschewing “mental states” – later versions looked to behaviourism. “Revealed preferences” replaced utility. But the revealed preferences had to reflect true choices, and not actual behaviour. This, of course, raises the problem of induction again: how do we know a true choice from an accidental one? If it is because true choices are rational, then how do we explain “rational”?
- 54 It is tempting – and normally done – to endow agents with substantial powers of foresight and clarity, so they do not make mistakes, or fail to carefully consult their utility functions. But then how do we relate these paragons to the agents of the real world? If we simply compare the predictions of the model with the data, the best we can get is a match. To call this ground for supporting the theory is the fallacy of “affirming the consequent”.
- 55 Neo-Classical theory restricts the laws of psychology and/or the laws of behaviour to a single law that specifies that everyone faces diminishing marginal utility (or its equivalent). This solution allows people to have different utility functions, or preference maps, and contributes to managing both the general explanatory problem of methodological individualism and the “problem of conventions”. The only models allowed by the reductive methodological individualism of neo-Classical economics are thus those that exclude all variables except psychological or behaviour states and natural givens.
- 56 As Hollis and Nell point out, either as psychology or as stylized behaviour, this is appallingly unrealistic. It does not allow for learning what we really think or feel, as we grow older and wiser, or experience trial and error. It is as though it is the easiest thing in

the world to live up to Socrates' dictum, "Know yourself". Nor is there provision for changing one's mind, or for being of "two minds" about a serious decision – "my inclinations say one thing, my sense of duty another". Nor is there any account of how knowledge and skills have been acquired or how they are maintained. Yet all of these features can be seen in the day-to-day conduct of businesses and households.

Is Neo-Classical Economics defective?

- 57 To sum-up: Neither the induction problem, nor the problems of methodological individualism can be solved within the framework of neo-Classical assumptions. The neo-Classical approach is to call on rational economic man to solve both. Economic relationships that reflect rational choice should be "projectable". But that attributes a deductive power to
- 58 "rational" that it cannot have consistently with positivist (or even pragmatist) assumptions (which require deductions to be simply analytic). To make rational calculations projectable, the agents may be assumed to have idealized abilities, especially foresight; but then the induction problem is out of reach because the agents of the world do not resemble those of the model. The agents of the model can be abstract, but they cannot be endowed with powers actual agents could not have. This also undermines methodological individualism; if behaviour cannot be reliably predicted on the basis of the "rational choices of agents" a social order cannot reliably follow from the choices of agents.
- 59 A dilemma is evident:
1. Either economic agents and activities are conceived in such a way that the neo-Classical assumptions are sufficient to entail the vision of optimality resting on the two critical theses, in which case the model cannot, in principle, apply to the world in which agents are brought into being and trained in the social context of functioning institutions that have to be supported and maintained by carrying out productive activities that depend on our present laws of physics and engineering; or
 2. Economic agents and activities are conceived in a manner consistent with regular reproducibility, in which case the model can apply, but the door is wide open to disequilibrium and sub-optimality - adulteration in the product and exploitation in the factor market are both conceivable, even likely, as the result of optimal decisions; unemployment and fluctuations may be widespread, optimality will be a farce, and according to the authors, there may be a warm welcome to both Veblen and Marx.
- 60 The theoretical weaknesses of the Walrasian general equilibrium paradigm were the root of the unsatisfactory connection between theory and measurement in economics. Econometrics practice too often consisted of testing weak implications of neo-Classical models against even weaker alternatives. There is a lack of any close connection between theoretical concept and operational measurement that informs the physical sciences, as well as any confrontation of real alternative hypotheses in empirical tests. These problems could be explained by basic structural flaws in the Walrasian theory itself.

Hollis and Nell as Foundations for Reconstructing Structural Econometrics

- 61 Two crucial questions arise in addressing the problems of structural econometrics. The first concerns the adequacy of the methodology of neo-Classical economics for the job. This question calls for re-examining the relationship between positivism and the methodology of neoclassical economics, which is what I have done in section 2. The second question concerns whether we can find a better approach. So can we determine whether a superior methodology – for example, “Hollis and Nell’s (1975) framework” – could be found for reconstructing the foundations?
- 62 To address this properly, I wish to show how Hollis and Nell’s critique can become a methodology. For, perhaps surprisingly, there are good reasons for considering their framework as offering “foundations” for reconstructing structural econometrics, foundations that complement and extend the original ideas of Haavelmo’s (1944) monograph. Haavelmo’s (1944) work is probably the most important landmark in the history of econometric modelling,⁴ but, unfortunately, Spanos (1989) argued, it became a classic much too early, and has been widely misunderstood. However, our argument will show that Hollis and Nell’s (1975) approach complements Haavelmo’s (1944) methodological framework. Then, more speculatively, I will suggest that their work actually extends the methodology in ways that help to meet some of the widely prevalent objections to structural econometrics.
- 63 Haavelmo (1958) observed that weak theoretical neo-Classical economic foundations rendered suspect the policy value of most econometric models. Haavelmo’s early exposure to empirical work made him aware of the need for a more solid theoretical foundation for empirical work as well as the need for theory to be inspired by empirical research. It is not surprising that Haavelmo devoted the end of his career to re-examining the neo-Classical theory of investment (see Haavelmo, 1960).⁵

Revisiting Haavelmo (1944) in the light of Hollis and Nell (1975)

- 64 There are several remarkable connections and similarities between the thoughts of Haavelmo (1944) and that of Hollis and Nell’s (1975) vision and their methodology of macroeconomic model building. Most obviously, both are acutely concerned about the discovery of the economic structure, the problems of model specification, the identification problem and stochasticism.
- 65 But the similarities go deeper. Both Hollis and Nell and Haavelmo are concerned about why economics, so far, has not led to very accurate and universal laws like those obtaining in the natural sciences. They also both raised the question of the degree of permanence of economic laws, asking how to judge the degree of persistence over time of relations between economic variables, holding that these problems are directly connected with the general question of whether or not we might hope to find elements of invariance in economic life, upon which to establish permanent laws. Hollis and Nell and Haavelmo both want to establish and define the foundations on which reliable econometric relationships rest; in what sense they are reliable or well confirmed, and how they compare with laws in the natural sciences.

- 66 Haavelmo (1944) provided the unifying foundations for present day econometrics by laying the groundwork for the probabilistic foundations of econometrics (see Morgan, 1990, ch. 8). Haavelmo had to demonstrate that probabilistic approach in econometrics was first of all an instrument that would allow the resolution of the practical and technical problems of econometrics: the recourse to probabilistic methods is justified according to criteria of efficiency.
- 67 Haavelmo's "Probability Approach" is a highly technical work, but the first two chapters, "Abstract Models and Reality" and the "Degree of Permanence of Economic Laws", are a master piece of economic methodology. They describe clearly Haavelmo's epistemological framework "for understanding what it entails to do scientific research as a 'passive observer'" (Boumans, 2014, p. 1). Morgan (1990, p. 243) observed that "by adopting probability theory, Haavelmo (1944) suggested that economists would be providing themselves with an adequate framework for conducting research and rigorous testing of theories in place of their present vague notions".
- 68 Morgan (1990) pointed out that Haavelmo's (1944) major points are set out in the Preface. The arguments of the succeeding 115 pages involved a discussion of many issues in econometrics, in all of which he made use of probability ideas to provide an integrated treatment of the subject and practice of econometrics. Haavelmo covered such difficult questions as the permanence of economic laws, the autonomy of relationships and the question of prediction.
- 69 Haavelmo was writing in an environment that was extremely hostile to probability, the econometricians of the 1930s remaining strongly committed to a deterministic representation of economic reality. However, by the late 1940s, Haavelmo's probability approach had become widely accepted in econometrics. A comparison of pre-Haavelmo era with the post-Haavelmo econometrics may help to identify exactly what was revolutionary in his work (see Morgan, 1990, p. 256).
- 70 Spanos (1989, 2012) argued that the re-examination of Haavelmo's probabilistic approach in econometrics provides insights into the weaknesses of the textbook econometric approach and suggests possible modifications that might help save what is valuable in the program. In particular, following Hollis and Nell (1975), I will suggest that part of the problem is a failure to specify relationships in realistic terms, where "realism" is based on fieldwork and conceptual truths. The methodology proposed by Haavelmo includes important elements which have either been discarded or have never been fully integrated within the textbook approach. By reconsidering these elements within Hollis and Nell's framework, I make here a case for an alternative methodology that still remains true to Haavelmo's initial vision.

Hollis and Nell's Alternative Approach

- 71 Hollis and Nell have charged that neo-Classical economic theory arguably provides the ontological basis (the rational individual) and the corresponding individualistic methodology of the modern econometrics that has come to replace structural econometrics. The result is that neo-Classical based econometrics, which functions at the level of appearances and events, fails to develop any insight into deep structures—it interprets whatever it sees as individuals choosing with some degree of (perhaps bounded) rationality. It simply relates observables to one another, putting choices and actions together into equilibrium patterns.

- 72 In Hollis and Nell's vision structural econometrics is conceived not as the estimation of theoretical relationships nor as a procedure in establishing the "trueness" of economic theories, but as an endeavour to understand observable economic phenomena of interest using conceptual analysis in conjunction with the fieldwork approach and analyzing observed data in the context of Haavelmo's probabilistic approach to structural econometrics. They argued that an adequate grasp of both the ontological and methodological foundations of econometrics are prerequisite if sound empirical economic research is to be conducted effectively.
- 73 The main thesis of Hollis and Nell and later Nell (1998) is that if adequate fieldwork has not been done, no one will know what the numbers mean (is this depreciation due to wear and tear of equipment, or is it tax evasion?) or what the supposed relationships actually are (maximizing, satisficing, following rules of thumb?). Fieldwork will give us the concepts, but then the concepts have to be fitted into a realistic structure – a structure that must, however, be more precise, more realistic, and, in many respects, more complex, than any heretofore available. In formulating its abstract quantitative notions and concepts, theory must be inspired and guided by the techniques of observation in the field; armchair empiricism won't do the job.
- 74 Hollis and Nell's (1975) approach reflects Haavelmo's (1944) econometric thinking and it is superior to that advocated by Pragmatism, which cannot give a coherent account of theoretical concepts, especially in relation to empirical work (and by contrast leads, in Nell's expression, to "armchair empirical work"). In pragmatism, there is no need to distinguish the essential characteristics of an institution from its accidental properties, because there are no essential characteristics. No such distinction can be drawn. There is no need to investigate the inner workings of a system, because, inner and outer are just a matter of the observer's position. As Nell (1998) will put it, an accident of perspective.⁶
- 75 These alleged difficulties are all manageable, drawing on fieldwork and conceptual analysis, and bearing in mind the distinction between reliable and volatile relationships. Hollis and Nell (1975, ch.1) suggested conceptual analysis, understood as a flexible search for conceptual truths, interacting with fieldwork, as a method by which to approach economic issues and econometric modeling. But then we must confront the fact that the neo-Classical tradition has little interest in fieldwork, or in structure. Furthermore, Hollis and Nell (1975) argued that this presents the modeler with insurmountable difficulties at the statistical model specification stage when the data do not fit the straightjacket chosen for them without their nature being taken into consideration. The problem becomes more apparent when the theoretical model is turned into a statistical econometric model by attaching a white noise error term to a reinterpreted equation in terms of observables variables.
- 76 Hollis and Nell have explained briefly the identification and specification problems making use of the supply and demand model (Hollis and Nell, 1975, p.81-84). They argue that theory provides the econometrician with a way of specifying this relationship properly and identifying relationships which could not, otherwise, have been unravelled from his data (Hollis and Nell, 1975, p. 74). They argue that theory is a determining factor in the choice of facts to be retained.⁷
- 77 In this respect, their approach parallels very closely that of Haavelmo (1944). Indeed, Haavelmo (1944) argued that we cannot do without theoretical (economic) tools when trying to understand and explain real life events.⁸ Some (economic) scheme conceived a

priori is a necessary framework for a simple description of real phenomena (1944, p. 1). Haavelmo (1944, ch. 1) defines the intended scope of the theory as purporting to provide abstract descriptions of real phenomena of interest. Moreover, Haavelmo (1944, p. 3) sees theoretical models as human constructs rather than hidden truths: “It is not to be forgotten that they are all our own artificial inventions in a search for an understanding of real life; they are not hidden truths to be discovered”. Furthermore, Haavelmo (1944) had also stressed the role of a priori economic theory in substituting for controlled experiments. He provided a careful analysis of the conceptual basis for the identification problem. In particular, he developed the vocabulary of structural relationships; and, though he more frequently referred to Frisch’s terminology of confluent relationships.

- 78 Some (economic) scheme conceived a priori is a necessary framework for a simple description of real phenomena (Haavelmo, 1944, p.1). But the truth of theory is a normal presupposition of specifications and identifications in econometric work. As Hollis and Nell (1975) pointed out, growth theory would be vacuous without the collection and analysis of growth statistics. Yet the collection of relevant statistics and specially the estimation of parameters has been predicated on the truth of macro-theory and of growth theory (Hollis and Nell, 1975, p.74).
- 79 Theoretical ideas cannot be based on implausible or impossible assumptions. Haavelmo, Like Hollis and Nell and later Nell (1998), claimed that an adequate macroeconomic theory is one that realistically describes and simulates an economic society that would be feasible under some economic policy. Haavelmo argued that economic theory should try to explain the causal mechanisms that generate observed economic phenomenon. Econometrics is needed to help quantify the magnitude and net effect of forces that generate a set of economic observations. It can only function properly if the underlying economic theory is adequate.
- 80 Haavelmo cautioned against premature axiomatisation. In particular, he was concerned that the microfoundations of neo-Classical theory implied a macro economy that bore little resemblance to the real world. Like Hollis and Nell (1975) and later Nell (1998), Haavelmo wondered if it might not be better to start with “a realistic conception of the macro economy and ask what sort of micro-foundations would support it. Achieving the latter would then provide the basis for an appropriate axiomatisation” (Chand, 2012, p.18).

Hollis and Nell and Haavelmo on Stochasticism, Specification, and Uncertainty

- 81 Hollis and Nell and Haavelmo are concerned with identifying strong regularities. Moreover, the textbook approach would benefit by re-aligning itself with them. Both argue that theory must be taken into account; on this there is agreement. Both argue that theory is needed to define the true variables. An important question is just what kind of theory (Hendry, 2004). Haavelmo suggested that theory must be realistic. Hollis and Nell, and especially Nell (1998), go further and argue that theory must reflect conceptual truths and must be based on fieldwork. Haavelmo agrees in regard to fieldwork.⁹ Both want theories put to the test against the data, and to be modified in the light of the data; both oppose using theory to shape the data to meet pre-existing conceptions. Let’s first turn to stochasticism.

Stochasticism

- 82 Consider the role of stochasticism in mainstream economics. Boland (1982, p. 122) argued that “stochasticism involves model building, as it requires an explicit modelling assumption that might be false, so it should not be taken for granted”. Let’s see how modern econometricians deal with this.
- 83 Following Hollis and Nell (1975) and Nell (1998), one could argue that there are two worlds (though neither Hollis and Nell nor Nell does so label them): the real world that we observe and the model world of the theory or mathematical model that we construct. The model will always abstract from reality. But sometimes the theory requires that the model consists of idealized actors or circumstances or behaviour, so that nothing real could ever closely correspond. This raises special problems that we shall discuss later. When we say the theory (or model) is true, we mean that the real and the model worlds exactly or at least adequately correspond. Many will argue that there are obvious reasons why, even with good theories, the correspondence will not be exact (for example, errors of measurement, irrational human behaviour, etc.). For these reasons, modern economists build stochastic models that explicitly accommodate the stochastic nature of the correspondence (see Boland, 1982, pp. 122–3). For example, we can assume that the measurement errors leave the observations in a normal random distribution about the true values of the model world. This means that the correspondence itself is the stochastic element of the model.
- 84 From Haavelmo’s perspective, contrary to that of modern econometricians, it is the “model that is stochastic”, rather than the “world” or the “environment”. Any test of a stochastic model is as much a test of the assumed correspondence as it is of the theory itself. Modern econometricians do not seem to be willing to go all the way with Haavelmo and thus still to see a possibility of stochastic models being helpful in the assessment of exact theories and models (see Davis, 2000; Nell and Errouaki, 2013; Spanos, 1989). It could also be said that stochastic models follow from a methodological decision not to attempt to explain anything completely.
- 85 Boland (1982, 2000) argued that one can choose to see the world as being necessarily stochastic only if one assumes beyond question that one’s model is true (and fixed) and thus that any variability of the correspondence is due entirely to the unexplainable changes in the real world. Thus, Stochasticism can be seen to put the truth of our theories beyond question. Neo-Classical econometrics is a major digression from Haavelmo’s econometric thinking and the founders’ unification vision.
- 86 Haavelmo (1944) and Hollis and Nell (1975) raised similar points on the inadequacy between “the true value of the variables” and “the observed value of economic variables”. They both agree that the observed values may not be wholly accurate. But they stress that is a practical difficulty, serving mainly to introduce a point which is crucial to their argument. For the observed values of variables are not the decisive tests. They must be corrected for measurement error and non-economic interferences and then redefined, to yield what they both call “the true values of the variables”.

Specification and Uncertainty

- 87 In important areas Hollis and Nell go beyond Haavelmo. For example, problems may arise, not from theory as such, but because of an over-reliance on individual maximizing

theory. Haavelmo supports *realistic* theory, but does not criticize specific examples of unrealistic theory. Yet many actual economic relationships simply may not fit the maximizing models. Instances where maximizing seems out of place can also easily be found in business pricing behaviour, inventory management, etc. where rules of thumb are common. By contrast optimizing is widely used in production scheduling). Field work and clear thinking about the necessary presuppositions of economic activity may suggest better ways of theorizing. This would result in more appropriate definitions of theoretical variables and, importantly, in improved specifications.

- 88 Haavelmo does not try to distinguish reliable from unreliable or inherently volatile economic relationships. Hollis and Nell, however, consider programming and production models reliable. The former are reliable because they are prescriptive and depend on rationality. Given a goal and various constraints and conditions, a programming model tells us what the agent ought to do. But it does not tell us anything about what will happen. Production models, on the other hand, are descriptive; they tell us how the system maintains itself. They show us how things work. They are reliable because they are solidly grounded in contracts and commitments, including commitments to use the current technology. These are things which cannot easily or quickly be changed. The point of these models is to show in some detail the interactions by means of which the system works. Predictive models, Hollis and Hell's third category, also purport to be descriptive, but being future-oriented, contain inherently unreliable relationships (as well as reliable ones derived from production models.) Unreliable relationships are those which are independent of commitments and contracts, but depend, for example, on expectations of future sales or prices. Such expectations are inherently uncertain, in the sense of Knight (1921) and Keynes (1936), and relationships which depend on them are liable to sudden shifts and changes.
- 89 Relationships, then, differ in regard to uncertainty; some are uncertain, other relationships seem quite reliable. These are well understood, and can easily check our knowledge in a number of ways.
- 90 We can describe these relationships; we understand why they hold. They rest on social and technological regularities. Of course, there may be data uncertainties, and they may be disrupted by accidental or interfering factors. Here probabilistic methods will help us deal with such matters, and using them we can establish reliable numerical relationships. (Employment and output, consumption and income, the circulation of money, and expenditure and employment multipliers are examples.)
- 91 By contrast, other relationships are simply inherently unreliable. We know the variables are connected; we understand why there might be causal pressures. But we cannot measure the magnitudes, and sometimes not even the direction, of these influences. We can list the factors influencing investment, for example, or the stock market; but which factors are more important, and even the nature and direction of the influence, may vary from time to time. Nor can we tell in advance when the nature of the influence will change.
- 92 This should not be surprising. Employment and output, consumption and income, and the multipliers, all depend on the existing structure of the economy, grounded in property and contract, reflecting technology and social habits and obligations. These matters change only slowly. But investment and the stock market depend on our expectations of the future – both the future of markets, and the future of technology. We simply do not

know what will happen or what will work. New information will lead some of us to change our minds one way, others another way. Expectations and valuations will shift. There are no grounds here for stable relationships. The probability approach may be some help, but it will not be much help, because the uncertainty is not only inherent, the degree of uncertainty is inherently large.

Conclusion

- 93 Great thinkers can control their thoughts, but they cannot control how these thoughts fare after they have been made public. Some of the most important insights may not be noticed or properly appreciated until many years later. This is the case with Haavelmo's influence on econometric modeling and Hollis and Nell's influence on economic methodology.
- 94 While the simultaneous-equations approach to statistical modelling met with success (Haavelmo, 1943), Haavelmo's (1944) methodological insights have not attracted the attention they deserve (Spanos, 1989, 2012). But as both Hollis and Nell (1975) and Haavelmo (1944, 1997) argued, it is not so much the development of a methodology specific to econometrics that is required; what is required is a unified scientific methodology for economics in general, in which econometrics would not be separate, but play a role coordinated with the rest. Haavelmo (1944, 1958, 1997) and Hollis and Nell (1975) and later Nell (1998) have insisted on including fieldwork to bridge the gap between the various theoretical models proposed and the actual reality of what exists and has to be reproduced and maintained.
- 95 Let's sum up the mainstream neo-Classical methodology. There is no room for fieldwork or conceptual analysis. Theories are composed of definitions, assumptions and hypotheses. Hypotheses assert relations between variables. The validity of hypotheses depends on solving or circumventing the problem of induction. Behavioural economic variables apply to an economic agent, none other than rational economic man offered by positive economics, as in the phrase of the article title. Economic hypotheses were not to be rejected for non-economic reasons. In other words, economics does not study man in general but only economic man. Given rational behaviour and *ceteris paribus*, the predictions apply to the true values of variables. One of the *ceteris paribus* clauses requires that the agents whose behaviour is to be predicted be rational. Rational economic man is both the average and the ideal, abstracted from actual marketers with the aid of general assumptions about human desires. The true values of variables are those derived from the actions of a rational agent in given circumstances – and this (conventionally) solves or evades the problem of induction.
- 96 Part of the programme of structural econometrics was to find and numerically estimate such laws. This project is reasonable, justified and important – except for the fact that those carrying it out thought they were looking for laws of the same kind as those in the natural sciences, whereas the laws of economics are significantly different. At the core of their separate arguments about the foundations of structural econometrics are deep understandings of the significance of economic laws and what a scientific variable is, and how scientific variables enter into functional relationships. Furthermore, I have argued that Hollis and Nell's methodological institutionalism has uncannily close parallels to Haavelmo's methodological structuralism.

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NOTES

1. Karim Errouaki is coauthor with Edward J. Nell of *Rational Econometric Man* (London, Elgar, 2013), with Edward J. Nell and Federico Mayor Zaragoza of *Reinventing Globalization after the Crash* (2014), and with Edward J. Nell of *Hard Drugs & Easy Money* (forthcoming, 2015). He is a former Special Advisor to UN Secretary General Dr. Boutros Boutros Ghali and to Director General of

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2. This paper is an expanded version of a paper I presented at the Hollis Memorial Conference held at the New School, NY, November 18th, 2004. It is also based on material in Chapter 1 of a book (*Rational Econometric Man*, 2013), co-authored by Edward Nell and Karim Errouaki. The author extends appreciation to his colleague, friend and mentor Professor Edward Nell for encouraging my ventures into econometric methodology and philosophy. I would especially like to thank Margaret Archer, Margaret Gilbert, Russell Hardin, Shaun Hargreaves Heap, Bernard Hodgson, Brendan Hogan, Simon Hollis, A.J. Julius, Tony Lawson, Isaac Levi, Steven Lukes, Richard Miller, Timothy O'Hagan, Alex Rosenberg, and Pavlina Tcherneva. I owe a great debt of gratitude to Edward J. Nell, Lawrence Boland, Gary Mongiovi and Tom Phillips who read and commented on several drafts of this paper and made important suggestions and many editorial improvements. At various stages in the progress of this work, I received comments and suggestions or materials from: Ramiro Cercos, George Davis, Christian Deblock, Duncan Foley, Davide Gualerzi, Stephen Kinsella, William Milberg, Stéphane M. Mouandjo, Steven Pressman, Willi Semmler, Anwar Shaikh, Aris Spanos, Alerandro Vercelli, and Vela Velapullai. I thank three anonymous referees for highly valuable and constructive advice. The usual disclaimer applies.

3. A new and revised edition of the book was published in 2003. No comment on Boland's work would be complete without a tribute to his friend and teacher, Agassi, who introduced him to the "Socratic Popper". Boland describes how the received views on methodology in economics are Conventionalism and Instrumentalism. He addresses the way that these assumptions and related philosophical issues permeate the way that economists actually go about their main tasks, namely, model building.

4. Morgan (1990, ch. 8) offers an in-depth account on Haavelmo's contribution to econometrics. Haavelmo's place in the history of econometrics has been applauded by many (see Bjerkholt, 2007; Hendry et al., 1989; Hoover, 2012; Malinvaud, 1988; Qin, 1993).

5. 1960 was the date of exit of Frisch and Haavelmo from econometrics. The exit of the Oslo professors from econometrics is still an open question in the history of econometric thought (see Epstein, 1987, ch. 4).

6. For further details see Nell (1998, ch.3).

7. Fair (2004, 2012) emphasized the importance of theory in model specification and argued that theory was also clearly important in the work of Tinbergen and Klein. Nearly half of Klein's (1950) book is devoted to intertemporal optimizing models of households and firms.

8. In Haavelmo's approach, the link between a theoretical model and the estimated equations is considerably more sophisticated than it appears in the modern econometric textbook, where white noise error terms are simply attached to neoclassical theoretical relationships. For an account see Nell and Errouaki (2013, ch. 2).

9. Although Haavelmo (1958, pp 355-357) doesn't speak explicitly in terms of "fieldwork" we could interpret his econometric thinking as pioneering the advocacy for the fieldwork approach in econometric modelling. This way, econometrics as a "unified framework" will go beyond what Haavelmo called "repair work" upon the logical consistency of theories as submitted to econometricians in verbal or fragmentary mathematical form. For an account see Nell and Errouaki (2013, ch. 2).

RÉSUMÉS

La crise financière mondiale de 2008 a relancé le débat sur les fondements scientifiques de l'économétrie néoclassique. L'économétrie néoclassique interprète ce qu'elle voit dans un contexte où les acteurs économiques font des choix avec un certain degré (peut-être limité) de rationalité. Elle relie simplement les observables les uns aux autres, mettant ensemble des choix et des actions dans des modèles d'équilibre. Mais la méthodologie de l'économie néoclassique constitue-t-elle une base adéquate pour l'économétrie structurelle ? Pour répondre à cette question, l'auteur réexamine le cadre méthodologique proposé par Hollis et Nell dans *Rational Economic Man* (1975) sur la relation entre le positivisme et la méthodologie de l'économie néoclassique, et se demande si ce cadre peut servir de fondement à une reconstruction de l'économie structurelle. L'auteur propose ensuite une relecture du *Manifeste* de Haavelmo (1944), et compare les deux œuvres. Pour l'auteur, il existe de bonnes raisons de penser que le cadre méthodologique de Hollis et Nell (1975) peut servir de base à une refondation de l'économétrie structurelle qui irait ainsi dans le sens des idées originales avancées par Haavelmo dans son *Manifeste*.

The 2008 global financial crisis has rekindled the debate over the scientific foundations of neo-Classical econometrics. Neo-Classical based econometrics interprets whatever it sees as individuals choosing with some degree of (perhaps bounded) rationality. It simply relates observables to one another, putting choices and actions together into equilibrium patterns. But is this methodology of neo-Classical economics an adequate foundation for structural econometrics? To answer this question the paper reconsiders Hollis and Nell's examination of the relationship between positivism and the methodology of neo-Classical economics. The paper then goes on to determine whether or not, and in which sense, the Hollis and Nell's (1975) Framework can be considered as "foundations" for a reconstruction of structural econometrics. The paper further extends and develops the position exposed by Hollis and Nell (1975)'s *Rational Economic Man* and, inspired by a novel re-reading of Haavelmo's *Manifesto* (1944), compares the two works, arguing that there are good reasons for considering Hollis and Nell's (1975) framework as "foundations" for reconstructing structural econometrics, extending the original ideas of Haavelmo's (1944) work.

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Mots-clés : analyse conceptuelle, approche transversale, déduction, méthodologie économique, empirisme, observation participante, fondations de l'économétrie structurelle, fondations de l'économie néo-classique, Haavelmo, individualisme méthodologique, holisme méthodologique, positivisme, approche probabiliste en économétrie, problème de l'induction, choix rationnel, l'Homme économique, théorie rationaliste de la connaissance, rationalité, spécification, stochastique, approche du surplus, incertitude

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