Microfoundations: a decisive dividing line between Keynesian and new classical macroeconomics

M. De Vroey

Discussion Paper 2010-30

Institut de Recherches Économiques et Sociales
de l'Université catholique de Louvain

UCL

Microfoundations: a decisive dividing line between Keynesian and new classical macroeconomics?

Michel De Vroey [◊]

May 2010

Abstract

It is often argued that what marks the difference between Keynesian macroeconomics and new classical macroeconomics (the first installment of dynamic stochastic general equilibrium models) is the presence of microfoundations. These are deemed to be absent in the Keynesian approach, but central to the new classical one. The aim of my paper is to critically discuss this view. Lucas and Sargent defined the microfoundations requirement as consisting of two elements, optimizing behavior and market clearing. I claim that an alternative, weaker, definition is conceivable, which can be traced back to Hayek and Patinkin. According to them, the microfoundations requirement consists of a single criterion, optimizing planning. This definition, I claim, is better than the new classical one. Next, I examine whether Keynesian macroeconomics, which admittedly does not abide by the Lucas-Sargent definition, does accord with the Hayek-Patinkin approach. My conclusion is that Keynes's *General Theory* is indeed microfounded in this sense, although no single conclusion can be drawn for Keynesian models in general.

JEL classification: B 22; E 12; E 30.
Keywords: microfoundations, Keynes, new classical macroeconomics.

[◊] IRES, University of Louvain, michel.devroey@uclouvain.be
I thank Pedro Garcia Duarte and Gilberto Tadeu Lima for their comments on an earlier version of this paper.

Keywords: microfoundations; Keynes; Lucas; history of macroeconomics

JEL Classification: B22; E00

INTRODUCTION

The transition from Keynesian IS-LM macroeconomics to dynamic stochastic macroeconomics deserves to be labeled as a scientific revolution *à la* Kuhn. This expression refers to an episode in the history of a discipline where a period of normal science is disturbed by the persistent existence of apparently insoluble puzzles and a drive to move the agenda and the research methods in new directions. This is accompanied by thundering declarations of war (e.g. Keynesian theory is dead), a confrontation between the young and the old generation, the rise of new stars in the profession and the eclipse of old ones. The relevance of the scientific revolution hinges on the existence of a 'before' and an 'after', with a well delineated series of events in between, so that the type of work members of the community are engaged in after the revolution bears little resemblance to earlier practices.

The revolution in macroeconomics resulted from a sequence of episodes related both to the intricacies of the internal development of the discipline and to outside events. Friedman (Friedman 1968) and Lucas (Lucas [1972] 1981) recounted the story of the real effects of monetary expansion in a non-Keynesian way, thereby disqualifying the policy-menu idea associated with the Phillips curve. The emergence of stagflation in the 1970s was proclaimed to be a real-time experiment that confirmed Friedman's predictions about the inability of monetary policy to have a long-lasting effect on employment (Friedman 1968). Lucas and Rapping's work (Lucas and Rapping 1969) extending the sphere of equilibrium analysis began the downfall of the neoclassical synthesis — why try to graft disequilibrium onto an equilibrium theory if the equilibrium is all-inclusive? The blending of rational expectations and time inconsistency led to the dismissal of state interventions in the economy that were previously believed to be effective in increasing social welfare. Last but not least, Lucas's critique (Lucas [1976] 1981) questioned the ability of traditional macroeconomic models to serve the purpose of choosing between alternative policy options. All these factors brought the traditional Keynesian approach to its knees. As stated by Samuelson, this process had a ring of revenge: "The new classical economics of rational expectationists is a return with a vengeance to the pre-Keynesian verities" (Samuelson 1983, p. 212).

This revolution — at present often viewed as having led to the rise of DSGE (dynamic-stochastic general equilibrium) macroeconomics — occurred in two stages. In a nutshell, Lucas did the job of attacking the Keynesian paradigm and of introducing a series of new concepts and principles. Kydland and Prescott (1991) transformed Lucas's qualitative modeling into a quantitative research program — as Greenwood ([1994] 2005, p.1) put it, they took macroeconomics to the computer.

My paper is concerned with one particular aspect of the revolution, namely the claim that the introduction of the microfoundations requirement was one of its distinctive features.[1] Is this account valid, or are things more complicated? The purpose of my paper is to answer this question. Not-surprisingly, since I felt the need to write the paper, I am of the second opinion. I shall make two claims. The first is that the way in which Lucas and others posit the problem is unsatisfactory. An alternative, less demanding, conception of the microfoundations requirement, which I shall call the Hayek-Patinkin conception, ought to be considered. When this is taken into account, the new classical/real business revolution can be viewed as a narrowing of the content of the microfoundations requirement from its Hayek-Patinkin to its Lucasian version, rather than the replacement of a non-microfounded macroeconomics with a microfounded one. My second claim is that, while it is true that Keynes's theory and Keynesian macroeconomics are defective with respect to the Lucasian criterion for microfoundations (with some ironic exceptions), it is nonetheless mistaken to conclude that they lack microfoundations. In particular, Keynes's *General Theory* abides by the Hayek-Patinkin criterion, to me the most appropriate one.

The paper comprises five parts. In the first, I discuss Lucas's conception of the microfoundations requirement, and in the second his indictment of Keynesian macroeconomics. Part three discusses the justification for Lucas's standpoint. In part four, I introduce the alternative Hayek-Patinkin view of the microfoundations requirement and assess the Lucasian conception. In part five, I assess Keynesian macroeconomics against the two criteria.[2]

1. The microfoundations requirement as expressed by Lucas

From the 1970s onwards, a new methodological principle came to prominence in macroeconomics, the microfoundations requirement. This principle became the *sine qua non* of valid theoretical practice. The condition for a macroeconomic model to be microfounded is that it starts with a description of how agents make their choices, it being supposed that these are made in an optimizing way. That is, an objective function has to be maximized or minimized under given constraints. For all its generality, this condition is deemed sufficient to identify models that do not accord with it, and so ought to be rejected.

The same requirement has also been expressed differently by Lucas and Sargent (and Lucas on his own) under the name of 'equilibrium discipline'.[3] It states that, to be valid, economic

[1] While scientific revolutions are always a collective enterprise, it is nonetheless widely accepted that one person, Robert Lucas, played a pivotal role in the transformation of macroeconomics. As I result, I shall take him as the spokesperson for the wider group of economists who developed the new paradigm.

[2] My concern in this paper is limited to traditional Keynesian macroeconomics since there is no dispute about the fact that new Keynesian macroeconomics is solidly microfounded

[3] Henceforth the terms 'microfoundations' and 'equilibrium discipline' will be used interchangeably.

models should rest on two postulates: (a) that agents act in their own self-interest and their behavior is optimal; and (b) that markets clear (Lucas and Sargent, [1979] 1994, p. 15).[4] Here market clearing is the central notion. It refers to a situation where all agents' optimizing plans are compatible. Either they participate in trade or they prefer not to do so in view of the prevailing prices. These two postulates are deemed to constitute a universal requirement rather than being linked to particular models in view of their specific purpose. In the expression 'equilibrium discipline', the 'discipline' term refers not to agents but to economists. It is a rule that economists impose upon themselves and which stamps their specific way of looking at social reality. Accepting such a standpoint results in proclaiming that the notion of disequilibrium, which before was widely used, should be banned from the economic lexicon. The underlying reason is that it lacks microfoundations (Lucas [1977] 1981, p. 221) or refers to 'unintelligent behavior' (p. 225).

In the same vein, Kydland and Prescott (1991) have repeatedly identified the notions of neoclassical theory and the microfoundations requirements. To them, a model is neoclassical when it is constructed from "agents maximizing subject to constraints and market clearing" (Kydland and Prescott (1991, p. 164). Any model lacking microfoundations is not neoclassical. So, Kydland and Prescott view themselves as having transformed the initial Solow model, which was not neoclassical, into a neoclassical model by providing it with microfoundations.

One result of such a standpoint is the disappearance of the frontier between microeconomics and macroeconomics. As Lucas said:

> The most interesting recent developments in macroeconomic theory seem to me describable as the reincorporation of aggregative problems such as inflation and the business cycle within the general framework of 'microeconomic' theory. If these developments succeed, the term 'macroeconomic' will simply disappear from use and the modifier 'micro' will become superfluous. We will simply speak, as did Smith, Ricardo, Marshall and Walras of *economic* theory (Lucas 1987, p. 107–108).

Two additional remarks are worth making. First, it is sometimes claimed that new classicists invented market clearing.[5] For my part, I disagree with such an assessment. Although the expression is new, the idea of market clearing is of long standing in economics. Its presence in Walrasian theory is beyond dispute. But the same is true for Marshallian theory (with the additional complication that market clearing and disequilibrium can coexist (see De Vroey,

[4] Two implicit assumptions underpinning the equilibrium discipline are: (a) that people do not leave perceived gains from trade unexploited; and (b) that agents have learned everything there was to be learned.

[5] E.g. "New classical economics introduced two new and radical theoretical doctrines: … Second, the notion of market clearing required that such models should assume that supply and demand were kept continuously equal to one another in all markets" (Laidler, 2006, p. 56).

2007).[6] By challenging this consensus in the profession, Keynes was clearly thinking out of the box. Thus, rather than having invented market clearing, new classicists have just restored it at a higher level, signaling the end of the Keynesian recess.

2. Lucas's indictment of Keynes's *General Theory* and Keynesian macroeconomics

The gist of Lucas's criticism of Keynesian theory is that it does not abide by the equilibrium discipline. His attack develops at two levels. The first pertains to the general way in which Keynes addressed the issue of unemployment in his *General Theory*. In Lucas's ([1977] 1981) eyes, the mere intention to produce a theory of involuntary unemployment constitutes an infringement of the equilibrium discipline. As Lucas and Sargent ([1979] 1994) put it:

> After freeing himself of the straightjacket (or discipline) imposed by the classical postulates, Keynes described a model in which rules of thumb, such as the consumption function and liquidity preference schedule, took the place of decision functions that a classical economist would insist be derived from the theory of choice. And rather than require that wages and prices be determined by the postulate that markets clear — which for the labor market seemed patently contradicted by the severity of business depressions — Keynes took as an unexamined postulate that money wages are sticky, meaning that they are set at a level or by a process that could be taken as uninfluenced by the macroeconomic forces he proposed to analyze (p. 15).

Keynes's lapse from the equilibrium discipline, Lucas is ready to admit, was understandable in view of the apparent contradiction between cyclical phenomena and economic equilibrium in the context of the Great Depression. Still, *ex post* it ought to be interpreted as having prompted a long detour in the progress of economic theory. It is an example of "bad social science: an attempt to explain important aspects of human behavior without reference either to what people like or what they are capable of doing" (Lucas, 1981, p. 4). And what is true for Keynes is also true for Keynesian macroeconomics, Lucas declared in an interview published in a University of Colorado magazine, *The Margin* :

> I think a lot of the work in Keynesian economics has gotten too far away from thinking about individuals and their decisions at all. Keynesians don't often worry about what actual individuals are doing. They look at mechanical statistical relationships that have no connection with what real individuals are actually doing (Lucas undated, Box 27, Correspondence 1989 folder).

[6] Earlier economists' justification for the presence of market clearing were different from Lucas's. Take for example Marshall. He might have claimed that a proper domain, other than value analysis, was available for the market non-clearing phenomenon, namely business cycle and monetary theory. He might also have stated that that there was little harm in postulating market clearing, since the only important equilibrium concept was normal equilibrium. Discarding the possibility of disequilibrium as a departure from normal equilibrium would have been inadmissible, but discarding the possibility of departures from market-day equilibrium (the lower equilibrium concept) would be a matter of benign neglect.

The second level of criticism is the well-known 'Lucas critique' ([1976] 1981). Here, his target is the macroeconometric models of the time, all of which had a Keynesian inspiration. Lucas's claim is that, although they do a fairly good job of forecasting, these models are a failure as far as the assessment of alternative policies is concerned. Their main flaw is their lack of microfoundations. This leads to endogenous variables, sensitive to variations in economic policy, being transformed into exogenous ones. As a result, a model of the economy estimated at a period during which a particular institutional regime holds sway will provide inadequate information for assessing what might occur under a different regime. According to Lucas, to avoid this defect, the parameters of the model need to be 'deeply structural' i.e. they must be derived from the fundamentals of the economy, agents' preferences, and technological constraints.

3. Lucas's justification of the microfoundations requirement

To paraphrase Keynes, the microfoundations requirement conquered macroeconomics as quickly and as thoroughly as the Holy Inquisition conquered Spain. More curiously, this conquest occurred without any justification being provided, as if the case was so obvious that none was needed. In view of the central character of this methodological principle, such a lack looks odd. In this section, I ponder on why this is the case and reconstruct how Lucas might justify his standpoint.

To make sense of the microfoundations requirement, it is necessary to view it in the broader context of Lucas's methodological world view. Two points have to be brought out. The first is that, to him, a theory and a model (i.e. a mathematical model) are the same thing. A theory/model is concerned with fictive imaginary constructions, and is necessarily unrealistic. This conception, it should be noted, Lucas inherited from Walras.

> On this general view of the nature of economic theory, then a 'theory' is not a collection of assertions about the behavior of the actual economy but rather an explicit set of instructions for building a parallel or analogue system – a mechanical, imitation economy (Lucas [1980] 1981, pp. 271-272).

The second point is that, to Lucas, equilibrium is a characteristic of the way in which economists look at reality, rather than a characteristic of reality. Let me expand on this.

The traditional view, from Smith onwards, is that equilibrium forces are at work in reality. While there is a low probability that equilibrium is realized at any given moment, the very fact that the economy is out of equilibrium triggers feed-back effects which bring it closer to equilibrium. In other words, it is asserted that equilibrium and disequilibrium, viewed as part and parcel of the same notion, are features of reality. As a rough approximation, such a statement has common sense going on for it. The originality of Lucas's standpoint is the way

in which he distances himself from common sense by arguing that the issue of whether equilibrium or disequilibrium prevails in reality cannot be solved. There is no way to ascertain whether a market is in equilibrium — and neither can we ever delineate a market, which would be a prerequisite to deciding whether the market were in equilibrium. The conclusion to be drawn is not that we should forego the notion of equilibrium, but that we should use it differently. The following quotations make the point.

> Cleared markets is simply a principle, not verifiable by direct observation, which may or may not be useful in constructing successful hypotheses about the behavior of these series. Alternative principles, such as the postulate of the existence of a third-party auctioneer inducing wage rigidity and uncleared markets, are similarly 'unrealistic', in the not especially important sense of not offering a good description of observed labor market institutions (Lucas and Sargent [1979] 1994, p. 21).
>
> I think general discussions, especially by non-economists, of whether the system is in equilibrium or not are almost entirely nonsense. You can't look out of this window and ask whether New Orleans is in equilibrium. What does that mean? Equilibrium is a property of the way we look at things, not a property of reality (Lucas's interview with Snowdon and Vane, 1998, p. 127).[7]

Thus, Lucas's adoption of market clearing is made without any claim as to its real-world realization. It is simply a postulate. The validity of adopting it hinges on how 'productive' the models based on it are, and what can be done using such models (for example, can models of the business cycle be constructed on such premises?). So, Lucas claims, the equilibrium discipline is justified by 'the proof of the pudding is in the eating' type arguments. The fact that he and others have been able to construct an equilibrium theory of the business cycle is one such proof.

While Lucas's standpoint will look odd to macroeconomists who insist on the need for models be realistic (Marshallian macroeconomists), it will be congenial to those who define themselves as Walrasians. Optimizing behavior and market clearing are the hallmarks of Walras's theory and of neo-Walrasian models. This may explain why Lucas and his associates felt they hardly needed to justify the equilibrium discipline: it is a mere by-product of having made macroeconomics Walrasian (De Vroey, 2004a).

Does the new conception of equilibrium amount to attributing a greater or a lesser role to the notion of equilibrium? Removing disequilibrium from the picture suggests a greater role fo

[7] The same point was made earlier by Weintraub: "This symposium provided additional examples of such argumentations: the discussions generated by McCallum's paper, and Grandmont's, contained various appeals to the "Principle" that the world either was or was not in equilibrium. The commentators in this audience seemed to think that they had a way of discussing the truth of the idea that observed states were equilibria without committing themselves to any particular theory of macroeconomics. This is, of course, an illusion: equilibrium states, or disequilibria are characteristics of our theories, and are thus imposed on the world" (1990, p.273).

equilibrium. But the fact that equilibrium has become a postulate, and that it is no longer claimed that equilibrium and disequilibrium are characteristics of reality, amounts to shrinking the scope of the new conception of equilibrium as compared to the earlier one. Moreover, when every outcome is by construction an equilibrium, the normative connotation that was previously associated with equilibrium vanishes. Welfare considerations now need to bear on the comparison of alternative equilibrium positions.

Defending the microfoundations requirement also involves answering the objections that can be leveled against it. The first objection to be considered is that the market-clearing assumption is blatantly false. This is certainly the most widespread criticism of the Lucasian standpoint. Here are two examples, from amongst many other possible ones.

> I have probably to remind you that an important school of thought in modern economics chooses to deny everything. Its members argue that supply and demand actually do balance in the labor market as they do in the fish market (Solow 1990, p. 28).
>
> For twenty years or so, economics has taught that markets 'clear' continuously (Skidelsky 2009, p. xiii).

Lucas's reaction to this criticism is that it is based on a total misunderstanding of his standpoint. Since he made it clear from the outset that to him market clearing is a trait of the model economy, and not of reality, any criticism of its lack of reality is ineffective.[8] As a retort, he could ask his opponents how they propose to assess the presence of market non-clearing. The real difference lies deeper: it concerns the acceptance or rejection of the neo-Walrasian paradigm. While Lucas is an avowed neo-Walrasian, his critics are against this approach, and stand on the Marshallian side. Instead of viewing a theory and a model as identical, they hold that a theory and a model are two separate entities, the model being subservient to the theory.[9]

A second objection to market clearing is that it is outrageous to apply the optimizing behavior assumption to people who live in poor conditions or are even on the verge of starvation. Lucas's retort is that depicting agents as behaving in an optimizing way should not be equated with stating that they are blissfully happy. Frustration, on the one hand, and optimizing behavior and market clearing, on the other, can co-exist. In an interview with Klamer, Lucas calls John Steinbeck, a left-leaning author, to his rescue to make the point:

---

[8] The same holds for the rational-expectations assumption. Lucas holds that it ought to be viewed as a technical model-building principle rather than a proposition about reality. "One can ask for example, whether expectations are rational in the Klein-Goldberger model of the United States economy; one cannot ask whether people in the United States have rational expectations" (Lucas Archives, undated, Box 23, Barro Folder).

[9] Leijonhufvud aptly characterized this viewpoint as follows: "I propose to conceive of economic 'theories' as a set of beliefs about the economy and how it functions. They refer to the 'real world'…. 'Models' are formal but partial representations of theories. A model never encompasses the entire theory to which it refers" (1997, p. 193). The wider contrasts between the Marshallian and the Walrasian approaches are discussed in De Vroey (2009).

> Did you ever look at Steinbeck's book *The Grapes of Wrath*? It's a kind of protest pamphlet from the '30s about migrant farmers in California. There's one passage in there that is a better anecdote that I could have written for the kind of models I like. It illustrates the auction characteristic of the labor market for migrant farm workers. He writes about a hundred guys who show up at a farm where there are only ten jobs available. The farmer will let the wage fall until ten people are willing to work for that wage and ninety people say 'the hell with it', and just go on down the road (Klamer, 1984, p. 46).

Finally, Lucas, going on the offensive, argues that many of the critics of the market clearing assumption are inconsistent, revealing split intellectual personalities. They may well defend the market non-clearing cause in meta-theoretical discussions, but when it comes to constructing models they fall back on the market-clearing assumption. Tobin is one example. The following passage from a draft version of his review of Tobin's Yrjö Jahnson lectures (Lucas 1981), a passage that is absent from the published version, makes the point. It also shows Lucas's awareness of the difficulty of defending market clearing because it runs so deeply counter to common sense.

> One [loose end] is "cleared markets". Tobin heaps scorn on the idea that any sane person would approach a macroeconomic problem with this particular simplifying assumption in hand. I see Tobin use it in *all* the substantive analysis in the present volume and in all of his most valuable earlier work, and I see my colleagues in every applied field in economics put it to good use on a wide variety of problems, without apologies and without philosophizing. Yet, at the same time I *know* that if a plebiscite were taken among macroeconomists Tobin's view (when he philosophizes, I mean, not when he is actually producing economics) would win over mine hands down. Well, so much the worse for science by plebiscite. I will work my side of the street, and let others work theirs, and if mine be less crowded, perhaps I shouldn't complain (Lucas Archives, undated, Box 23, Tobin folder).

4. An assessment of Lucas's standpoint

The equilibrium notion has played a central role in political economy since its inception. So the idea of the equilibrium discipline as the hallmark of economics makes sense. However, I am unconvinced by the way in which Lucas and Sargent conceive it. Despite what they say, it actually contains only one criterion. Optimal behavior and market clearing are two sides of the same coin. They consider the same object at two distinct levels: optimal behavior refers to individual or personal equilibrium, while market clearing relates to what could be called 'interactive equilibrium', a state where all individuals' optimal plans have been made

compatible. Moreover, their conception sweeps under the rug a distinction that I, for one, find crucial. It was expressed long ago by Hayek ([1937] 1948), but subsequently felt into disuse.

> I have long felt that the concept of equilibrium itself and the methods which we employ in pure analysis have a clear meaning only when confined to the analysis of the action of a single person and that we are really passing into a different sphere and silently introducing a new element of altogether different character when we apply it to the explanation of the interactions of a number of different individuals (p. 35).

A similar insight is to be found under Patinkin's name when he draws a distinction between individual and market experiments (1965, pp. 11–12, 387–392). Yeager aptly commented on this distinction:

> An individual experiment involves discovering, at least conceptually, the desired behavior of an individual person, of a small or large group of individuals, or even of all individuals in the community, acting in certain capacities, under certain specified circumstances. Whether these circumstances are compatible with other economic conditions and whether they can in fact prevail (whether they are genuinely or even conceptually attainable, to use the Chicago terminology) is beside the point: it is not the purpose of an individual experiment, by itself, to describe the economic equilibrium that will tend to emerge. … This other type of analysis, which pulls together the results of various individual experiments, examines the conditions under which the plans of various persons would and would not mesh, describes the processes at work when plans fail to mesh, and describes the equilibrium position, is what Patinkin means by market experiments (Yeager 1960, p. 59).

It follows from Hayek's and Patinkin's standpoints that the notions of the *optimizing plan* and *optimizing behavior* designate different realities. Optimizing plans refers to agents' intentions before the opening of trading, the solution to the choice-theoretical problem with which they are faced.[10] Optimizing behavior refers to what is observable after trading has started. Thus, optimal behavior implies that the optimal plan has been realized. The gist of the above quotations is that optimizing plans and optimizing behavior need to be logically separated — there is a difference between finding a solution to a choice problem and implementing this solution. In contrast, whenever optimizing behavior is the sole concept used, the possibility of there being a difference between them is discarded by definition. This is the standpoint taken by Lucas and Sargent. Once it is adopted, it becomes misleading to claim, as they do, that the microfoundations requirement is based on two criteria, optimizing behavior and market

[10] In Patinkin's words: "We can consider the individual — with his given indifference map and initial endowment — to be a 'utility-computer' into whom we 'feed' a sequence of market prices and from whom we obtain a corresponding sequence of 'solutions' in the form of specified optimum positions" (1965, p. 7).

clearing. A single criterion is needed, and it is irrelevant whether this is called generalized optimizing behavior or market clearing.

This difference can also be expressed with reference to the notions of equilibrium and disequilibrium. Individual equilibrium is a state where an agent is able to achieve one element of his or her optimal plan. Individual disequilibrium refers to the opposite case, the inability of some agents to have any element of their optimal plan transformed into optimal behavior. As stated by Solow in his interview with Klamer, it refers to "situations in which people did not contemplate being at the start of the game" (Klamer 1984, p. 140). 'Equilibrium' here refers to what I labeled 'interactive equilibrium' above. "The general equilibrium implies that all subsets of agents are in equilibrium and in particular that all individual agents are in equilibrium" (McKenzie 1987, p. 498). That is, equilibrium requires individual equilibrium. This quotation confirms my view that optimizing behavior and market clearing are one and the same thing. Symmetrically, in the conception that I defend, optimizing plans and market clearing are distinct, while market non-clearing and individual disequilibrium go hand in hand.

Thus, we have two definitions of microfoundations. The Hayek-Patinkin conception requires that economic analysis is grounded on the assumption that agents formulate optimizing *plans*. The issue of whether all optimizing plans come through, i.e. whether market clearing prevails, is not considered as an element of the microfoundations requirement. The Lucasian conception is grounded on the stronger requirement of generalized optimizing behavior, i.e. market clearing. In the same vein, there also exist two ways of understanding the 'neoclassical' label. According to Lucas, and Kydland and Prescott, the granting of the neoclassical label ought to be conditional on the presence of the generalized-optimizing-behavior/market-clearing result. According to the Hayek-Patinkin conception, it suffices that the economic discourse is based on an explicit formulation of optimizing plans.

Which of these interpretations of microfoundations is preferable? They have in common the optimizing plan criterion, the adoption of which raises no serious objections.[11] So the answer hinges on the need for the market-clearing postulate.

Market clearing is the consequence of some prior assumptions related to 'trade technology', i.e. the institutional set-up that is needed to make the realization of equilibrium possible. Like other Walrasian models, Lucas's models are based on the *tâtonnement* or auctioneer hypothesis. This is a theoretical scenario explaining how the equilibrium values calculated by the economist when studying the logical existence of a general equilibrium could come into existence in the artificial economy described by the model. As soon as this hypothesis is

[11] The optimizing plan criterion amounts to assuming that agents have the ability to optimally solve any decision problem they encounter (with the ensuing correlates of rationality, information and rational expectations). This assumption is certainly an exaggeration, yet it is nonetheless acceptable as it is probably better, and certainly more tractable, than alternative assumptions.

adopted, the matter is decided: market clearing always occurs. But then market clearing is the direct consequence of the auctioneer hypothesis rather than a consequence of self-interest and rationality. The problem with the auctioneer hypothesis is that it runs counter to the essential nature of the theory's theoretical *explanandum*, because it amounts to picturing a decentralized system as a centralized organization of trade.[12]

So at the level of principle, there is no reason to adopt the market clearing postulate. On the contrary, states of individual disequilibrium seem to be a normal feature of the market system. In effect, in a system where decisions are taken separately in anticipation of future demand, it would be a miracle if no decision were ever proven wrong and coordination failures never occurred. The presence of these features is not synonymous with the system's lack of viability. Hence such states should be part of the theoretical representation of the economy. Because the Hayek-Patinkin conception of microfoundations allows their incorporation while the Lucasian does not, the Hayek-Patinkin interpretation appears to be more satisfactory than the Lucasian.

This being stated, it must be admitted that to date the incorporation of disequilibrim into economic theory has proven to be an almost insuperable task. From Adam Smith onwards, economists have neglected to address it in earnest. Keynes was the exception. He ought to be credited for having attempted the task, even though he failed in this enterprise. Subsequent Keynesian economists did not do much better.[13] So, to date, no robust general theory of individual disequilibrium is available. As a result, keeping the market-clearing premise can be justified on the Wittgensteinian grounds that "whereof one cannot speak, thereof one must be silent'. This justification is grounded on expediency — the admission that there is no alternative to the auctioneer scenario for arriving at equilibrium. But expediency should not be transformed into methodological virtue. Nor can it be claimed that the aim of constructing a disequilibrium theory must be rejected as a matter of first principle. Had Lucas contented himself with pointing out that Keynes had failed to achieve his disequilibrium project, I would have no complaints. My disagreement is with his further claim that the mere desire to engage in such a project is a sufficient reason for exclusion from the neoclassical economics community.

5. Assessing Keynesian theory against the microfoundations criterion

Let me finally address the issue of whether Keynesian theory abides by the microfoundations requirement. This issue can be broken down in three sub-questions. First, is there an adhesion to this principle? Second, if yes, to which of its two versions, the Lucasian or the Hayek-Patinkin version, does it adhere? And third, is the microfoundations requirement crucial to the

[12] See De Vroey (1998) for further discussion of this point.
[13] See De Vroey (2004b).

theory or is it dealt with off-handedly? As Keynes was a Marshallian economist, I start my investigation by considering how Marshall fared on this requirement.

Marshall

In Walras's *Elements*, the presence of the microfoundations perspective strikes the reader at once, as a result of Walras assuming that theory and model are identical. With Marshall, things are more complicated. The presence of the microfoundations requirement can certainly be detected in many passages of the *Principles*. Marshall's manifold references to the substitution principle are a testimony to this. But these passages belong to what can be considered the meta-theoretical part of Marshall's text, the purpose of which is to motivate or qualify his more substantive results. Chapter II of Book V of the *Principles*, introducing the corn model, provides a fine illustration of this. In its introductory paragraph, Marshall evokes the case of a young boy weighing the marginal utility of eating blackberries against the marginal disutility of picking them (without even mentioning these notions). The boy stops picking when these factors become equal. Marshall then jumps to a discussion in terms of market supply and demand. He proceeds in the same way in the other chapters of Book V of the *Principles*, the most theoretical part of the book. While frequently referring to agents' decision-making processes, especially firms', his analysis proper is concerned with market supply and demand analysis. Hence the impression that Marshall deals with microfoundations in an off-hand way. However, one should not stop at this impression. Looking at the Mathematical Appendix to the *Principles,* a different impression emerges: here the microfoundations perspective comes fully into play.

As to the question of whether the microfoundations requirement as conceived by Marshall is of the Lucas or the Hayek-Patinkin type, the answer has already been given at the beginning of the article. In Marshall's models market clearing is always present (De Vroey 2007). Hence in this respect, Marshall anticipates Lucas's understanding of the microfoundations requirement.

Keynes's *General Theory*

Considering the *General Theory* rather than Keynesian macroeconomics in general, it is clear that Keynes does not abide by the microfoundations requirement *à la* Lucas since his main purpose was to overthrow it (as it stood in his day). equilibrium discipline, was to Keynes a deliberate attempt to break away from existing theory for the very reason that it excluded involuntary outcomes, while everything indicated that such outcomes existed in reality. As to the question of whether Keynes's *General Theory* abides by the softer Hayek-Patinkin requirement, my answer is yes. There are no signs that Keynes wanted to depart from depicting agents as making optimizing plans. He certainly wanted his theory of effective demand, actually an extension of Marshall's analysis of firms' short-period production decisions, to be based on entrepreneurs' profit maximization (Keynes 1936, p. 23). Another

testimony to Keynes's commitment to microfoundations is his introduction of involuntary unemployment in Chapter 2 of the *General Theory* . Its presentation as an infringement on the second fundamental 'postulate' of classical economics amounts to constructing it in a microfounded way.[14] Translated into a modern terminology, the second postulate consists of stating (a) that agents will participate in the labor market only if the market wage exceeds their reservation wage, and (b) that in a divisible labor context they will participate up to the point where the marginal rate of substitution between consumption and leisure equals the real wage rate. To me, this is a strong sign that Keynes (unwittingly of course) reasoned in terms of the Hayek-Patinkin conception of microfoundations, i.e. starting the analysis from agents' optimizing plans without pre-empting the issue of whether these plans would be achieved. Keynes, of course, made the explicit claim that optimizing plans were not always transformed into optimizing behavior, but this does not invalidate the point: as soon as an optimizing plan is the starting point, the Hayek-Patinkin microfoundations requirement is satisfied.

I can now answer the question of whether Keynes's *General Theory* should be characterized as neoclassical. If the Hayek-Patinkin understanding of the microfoundations requirement is adopted, the answer is 'Yes', while if Lucas's definition is taken, it is 'No'.

This being said, if Keynes was in favor of a microfounded analysis, he contented himself with expressing this necessity without doing the job of providing such microfoundations. He was too much of a hurry to try to do it (and, had he tried, he would not have succeeded, the task being too difficult).

Additional evidence for my claim can be found in Keynes's criticism of Tinbergen's work. Keynes was sent proof copies of Tinbergen's two books, *A Method and its Application to Investment Activity* and *Business Cycles in the United Nations of America* (which became the two volumes of Tinbergen's *Statistical Testing of Business Cycle Theories* (Tinbergen 1939)), in order that he might comment on and approve them for publication. This led to an exchange of letters, first, with R. Tyler, his correspondent at the League of Nations, and, second, with Harrod. Eventually, Keynes wrote a review, which appeared in the September 1939 issue of the *Economic Journal*. Tinbergen's reaction to Keynes's criticism was published in the March 1940 issue. Keynes added a reply in the same issue. Here, I focus only on the passages that are relevant to my inquiry. In a letter to Tyler, dated 23 August 1938 (Moggridge 1973, pp. 285–6), Keynes expresses his dissatisfaction with Tinbergen's approach in a way that Lucas could easily endorse. One of his criticisms was that the coefficients of Tinbergen's model were calculated arbitrarily (Moggridge 1973, p. 286) — the equivalent of Lucas's statement that they lack microfoundations. Keynes also complained about the absence of expectations in

[14] "The utility of the wage when a given volume of labor is employed is equal to the marginal disutility of that amount of employment" (Keynes 1936, p. 5). In other words, what Lucas suggests is an effect of the demanding character of the equilibrium discipline, was to Keynes a deliberate attempt to break away from existing theory for the very reason that it excluded involuntary outcomes, while everything indicated that the contrary was true in reality.

Tinbergen's estimations: "Is it assumed that the future is a determinate function of past statistics? What place is left for expectations and the state of confidence relating to the future?" (p. 287). This should be music to Lucas's ears. Finally, in a letter to Harrod, dated 16 July 1938, Keynes wrote:

> I also want to emphasize strongly the point about economics being a moral science. I mentioned before that it deals with introspection and with values. I might have added that it deals with motives, expectations, psychological uncertainties. One has to be constantly on guard against treating the material as constant and homogeneous. It is as though the fall of the apple to the ground depended on the apple's motives, on whether the ground wanted the apple to fall, and on mistaken calculations on the part of the apple as to how far it was from the centre of the earth (Moggridge, 1973, p. 300)

The difference between Keynes and Lucas, it turns out, is that Keynes makes an anticipatory criticism of what was to become macroeconometric modeling, while Lucas criticized it *ex post.* But they both based their criticism on the argument that microfoundations were lacking.

Keynesian macroeconomics: theoretical models

Keynesian macroeconomics is too wide a field to be covered here. Moreover, it contains several different standpoints about microfoundations. To show this, I will consider two works that shaped the course of Keynesian macroeconomics, Modigliani's 1944 article and Klein's 1947 book, *The Keynesian Revolution*.

Modgliani's article played a decisive role in the development of macroeconomics by recasting Hicks's original model into its now standard textbook version.[15] The result, which Modigliani hails as a case of involuntary unemployment, follows from a labor supply schedule exhibiting a perfectly elastic section up to a kink, above which it becomes vertical. The employment level corresponding to the kink is called 'full employment'. And, "unless there is 'full employment', the wage rate is not really a variable of the system but a datum, a result of 'history' or of 'economic policy' or of both" (Modigliani 1944, p. 47). Whenever the demand for labor intersects the supply schedule on its horizontal section, involuntary unemployment is declared to exist. This model has been widely popular but with hindsight it is surprising that its flaws have remained undetected. For all the claim that it is Keynesian, this model has a market clearing outcome.[16] Moreover, as I have shown elsewhere (De Vroey, 2004b, Chapter 8), what Modigliani calls full employment, the maximum level of employment, does not dominate lower levels as far as welfare is concerned. This is due to the fact that in order to have an inverse-L supply schedule, it must be assumed that hours supplied to the labor market

[15] See De Vroey (2000).
[16] Lucas and Rapping characterized their 1969 model as Keynesian in spite of its market clearing result on the ground that Modigliani's model, which was viewed as an emblematic Keynesian model, also featured market clearing (Lucas and Rapping, 1969).

and hours of leisure are perfect substitutes. The conclusion to be drawn is that, semantics to the contrary notwithstanding, the Modigliani model and the myriad of models based on it satisfy the microfoundations requirement as understood by Lucas: they feature market clearing and optimizing behavior!

Klein's *Keynesian Revolution* was in a sense more Marshallian than *The General Theory* because it contained a mathematical appendix. In this appendix, Klein took a perfectly orthodox viewpoint emphasizing the need to give macroeconomics strong microfoundations. He derived aggregate consumption and liquidity preference functions from constrained individual utility maximization, considering "an individual household trying to maximize its utility function, which depends on the consumption of present and future commodities, and its structure of assets in the form of money and various types of securities" (Klein 1947, p. 192). Likewise, Klein derived the firms' investment function from a maximization of utility program. "The entrepreneur will be assumed to behave, with regard to the purchase of capital assets, according to the principles of profit maximization over the anticipated future life of the assets in question" (Klein 1947, p. 196). At the time, this was an advanced way of positing agents' programs. After a few, more or less *ad hoc* manipulations, Klein's reasoning ended up with the standard aggregate functions of the IS-LM model. His ultimate aim was to get to a market non-clearing result. To this end, he argued that the model lacked a full-employment solution, the effect of making the assumption, which he claimed was empirically verified, of a low interest-elasticity of the investment function. As a result, the saving and investment functions failed to intersect at any positive rate of interest. However, their matching was conceivable at a less-than-full-employment level of output, and Klein took the further step of assuming that such a shift in output would occur. In turn, this decrease in output, he claimed, would have an impact on the labor market, generating excess labor supply and trade away from the supply curve. This was involuntary unemployment in Keynes's sense.[17]

It would be unreasonable to expect an economist writing in the 1940s, with the aim of defending the Keynesian cause, to provide a waterproof demonstration of his claim. But in spite of its shortcomings, Klein's contribution was remarkable. With respect to the purpose of this paper, it shows that Klein wanted Keynesian theory to be firmly embedded in the neoclassical framework, at least in so far as this embodies the Hayek-Patinkin understanding of the microfoundations requirement.

Klein's project of firmly anchoring Keynesian analysis in a microfounded perspective was later taken up by Patinkin in his *Money, Interest and Prices* (1965). In turn, Patinkin's work, in conjunction with Clower's ([1965] 1984), served as a springboard for the so-called disequilibrium approach in macroeconomics associated with the names of Barro and Grossman (1971), Benassy (1975), Drèze (1975) and Malinvaud (1977). All these authors had

[17] For a criticism of Klein's reasoning, see De Vroey (2004b).

a microeconomics background and they set themselves the task of improving Keynesian theory by giving it more rigorous microfoundations (in the Hayek-Patinkin sense).

Keynesian macroeconomics: econometric models

Klein did more than reconstruct Keynes's theory theoretically. To him, the conceptual apparatus set up by Keynes in the *General Theory* "cried out for empirical verification (or refutation)" (Bodkin, Klein and Marwah 1991, p. 19). Undertaking this empirical extension became his life's work. Success came as Klein's joint work with Goldberger, *An Econometric Model of the United States* (1955) blazed the way for a new field of research: macroeconometric modeling.

The path to the econometric study of the economy as a whole had been opened almost two decades earlier by Tinbergen in his 1939 book, discussed above. In this book, Tinbergen expressed a view of microfoundations that was to be adopted by most of the members of the profession until Lucas launched his critique:

> Economic analysis may be applied to the behavior of individual persons or firms; or to the behavior of "industries", defined in some more or less arbitrary manner; or, again, to the behavior of whole groups of industries, such as those producing consumption and investment goods respectively, and of whole categories of economic persons, such as those engaged in the credit markets, or the labor market, as a whole. It is this last type of economic approach (sometimes spoken of as a "macro-economic" approach) which will be employed . … For it is this type of approach which seems most relevant to cyclical fluctuation, and which alone makes it possible to limit the number of variables considered to a figure which permits of their being effectively handled. It goes without saying that, in this approach, the coefficients found do not give any indications of the behavior of individual entrepreneurs, consumers, etc., but only to the average reactions of many individuals (Tinbergen, 1939, p.14).

This is a polite way of saying that, to all intents and purposes, microfoundations can be the object of benign neglect. Klein is the finest illustration of this standpoint. In his early writings, which were purely theoretical, he insisted on the need to base the analysis on the study of individual optimizing planning. However, when he began to do empirical work, he quickly realized that it was too difficult to deliver on this need.[18]

This remark brings me back to Lucas's criticism of Keynesian theory. I have argued that this criticism put the bar too high in that there is no solid reason for arguing that the Lucasian understanding of microfoundations is superior to the Hayek-Patinkin conception. However, when it comes to the second part of Lucas's criticism, the 'Lucas critique' proper, I have no

[18] The main reason for this, he stated, was the lack of data. With hindsight, it should be added that a lack of appropriate concepts was another effective barrier. For a study of Klein's intellectual progression from theory to econometrics, see De Vroey and Malgrange (2010).

complaints to make. The rational-expectations assumption accepted, Lucas is right in claiming that agents should be depicted as changing their optimal plans whenever the policy regime is modified. Actually, his criticism remains valid even when the Hayek-Patinkin definition is adopted since it bears on agents' devising their optimal plans. In other words, although they cannot be blamed in view of the difficulty of the task, traditional Keynesian macroeconometric models fail to abide by the Hayek-Patinkin conception of the microfoundations requirement, let alone the Lucasian conception.

Concluding remarks

This chapter has attempted to assess whether the microfoundations requirement is a decisive criterion for separating Keynesian macroeconomics from new classical macroeconomics. My conclusion is that, phrased in this way, the question is unanswerable. In effect, two different views of the requirement have to be distinguished. The Hayek-Patinkin view is based on a separation between optimizing plans and optimizing behavior, and implies that any model that starts from the agents' optimizing plan satisfies the microfoundations requirement. The Lucasian view puts the bar higher. To all intents and purposes, it conceives of the microfoundations requirement as being based on a single criterion, market clearing. That is, any model of market non-clearing fails this requirement. To my mind, there is no reason for adopting such a narrow definition as a question of principle. Its adoption as a modeling expediency is, however, defensible, in view of the difficulty of constructing market non-clearing models.

This paper has also assessed Keynes's work and Keynesian macroeconomics against the two understandings of the requirement. To limit myself here to a single result pertaining to Keynes's own work, the paper made two points. First, Keynes's theory should not be depicted as a failure to abide by the equilibrium discipline, since Keynes's aim was in fact to breach it. Second, when *The General Theory* is gauged against the Hayek-Patinkin conception of microfoundations, it passes the test hands down.

References

Barro, R. and H. Grossman (1971), "A General Disequilibrium Model of Income and Employment", *American Economic Review*, vol. 61, pp. 82-93.

Benassy, J.-P. (1975), "Neo-Keynesian Disequilibrium Theory in a Monetary Economy", *Review of Economic Studies*, vol. 42, pp. 503-523.

Bodkin R., L.R. Klein and K. Marwah (eds) (1991), *A History of Macroeconometric Model-Building*, Aldershot: Edward Elgar.

Clower, R. ([1965] 1984), "The Keynesian Counterrevolution: A Theoretical Appraisal", in Walker D. (ed.) *Money and Markets. Essays by Robert Clower*, Cambridge University Press: Cambridge, pp. 34-58.

De Vroey (2009), "Marshall and Walras: Incompatible Bedfellows?", University of Louvain, Department of Economics, Discussion Paper, No. 200908.

De Vroey, M. (2007), "Did the Market-clearing Postulate Pre-exist New Classical Economics? The Case of Marshallian Theory", *The Manchester School*, vol. 75, pp. 3-38.

De Vroey, M. (2004a), *Involuntary Unemployment: The Elusive Quest for a Theory*, London: Routledge.

De Vroey, M. (2004b). "The History of Macroeconomics Viewed Against the Background of the Marshall-Walras Divide", in De Vroey M. and K. Hoover (eds.), *The IS-LM Model. Its Rise, Fall and Strange Persistence*, Annual Supplement to Volume 36, History of Political Economy, Duke University Press, Durham and London, pp. 57-91.

De Vroey, M. (2000), "IS-LM '*à la* Hicks' versus IS-LM '*à la* Modigliani'", *History of Political Economy*, vol. 32 (2), pp. 293-316.

De Vroey M. (1998), "Is the Tâtonnement Hypothesis a Good Caricature of Market Forces?", *The Journal of Economic Methodology,* vol.5, pp. 201-221.

De Vroey, M. and P. Malgrange (2010), **"**From *The Keynesian Revolution* to the Klein-Goldberger Model: Klein and the Dynamization of Keynesian Theory", University of Louvain, Department of Economics, Discussion Paper, No. 201019.

Drèze, J. H. 1975, "Existence of Equilibrium under Price Rigidities", *International Economic Review*, vol. 16, pp. 301-20.

Friedman, M. (1968), "The Role of Monetary Policy", *American Economic Review*, vol. 58, pp. 1-17.

Greenwood, J. ([1994] 2005), Modern Business Cycle Analysis, *Rochester Center for Economic Research,* Working Paper, No. 520. July 2005.

Hayek, F. ([1937] 1948), "Economics and Knowledge" in *Individualism and Economic Order*, Chicago: The University of Chicago Press, pp.33-55.

Keynes, J. M. (1936), *The General Theory of Employment, Interest, and Money*, London: Macmillan.

Klamer, A. (1984), *The New Classical Macroeconomics. Conversations with the New Classical Economists and their Opponents*, Wheatsheaf Books.

Klein, L. (1947), *The Keynesian Revolution*, New York: Macmillan.

Klein, L. and A. Goldberger (1955) *An Econometric Model of the United States, 1922-195*, North Holland.

Kydland, F. and E. Prescott (1991), "The Econometrics of the General Equilibrium Approach to Business Cycles", *Scandinavian Journal of Economics*, vol. 93, pp. 161-178.

Laidler, D. (2006) "Keynes and the Birth of Modern Macroeconomics", in Bateman B. and R. Backhouse (eds.), *The Cambridge Companion to Keynes*, Cambridge: Cambridge University Press, pp. 39-57.

Leijonhufvud, A. (1997), "Models and Theories", *Journal of Economic Methodology*, vol. 4: 2, pp. 193-8.

Lucas, R. E. Jr. (1987), *Models of Business Cycles*, Basil Blackwell: Oxford.

Lucas, R. E. Jr. (1981), *Studies in Business Cycle Theory*, Cambridge (Mass.): The M.I.T. Press.

Lucas R. E. Jr. ([1980] 1981) "Methods and Problems in Business Cycle Theory", in Lucas (1981), pp. 271-96.

Lucas, R. E. Jr. ([1977] 1981), "Understanding Business Cycles" in Lucas (1981), pp.215-239.

Lucas, R. E. Jr. ([1976] 1981), "Econometric Policy Evaluation: A Critique", in Lucas (1981), pp. 104-130.

Lucas, R. E. Jr. ([1972] 1981) “Expectations and the Neutrality of Money”, in Lucas (1981), pp. 65-89.

Lucas R. E. Jr. (undated), Lucas Archives, Duke’s University Special Archives division.

Lucas R. E. Jr. and T. Sargent ([1979] 1994), “After Keynesian Macroeconomics” in Preston. R. Miller (ed.), *The Rational Expectations Revolution. Readings from the Front Line*, Cambridge (Mass.): The M.I.T. Press, pp. 5-30.

Malinvaud, E. (1977), *The Theory of Unemployment Reconsidered*, Basil Blackwell.

Marshall, A. (1920),), *Principles of Economics*, London: Macmillan, (eighth edition).

McKenzie, L. (1987), “General Equilibrium”, in Eatwell. J, M. Milgate and P. Newman (eds.), *The New Palgrave. A Dictionary of Economics*, London: Macmillan, pp. 498-512.

Modigliani, F. (1944), “Liquidity Preference and the Theory of Interest and Money**”**, *Econometrica*, vol. 12, pp. 44-88.

Moggridge, D. (ed.) (1973), *The Collected Writings of John Maynard Keynes. Vol. XIV, The General Theory and After, Part II Defence and Development*, London: Macmillan.

Patinkin, D. (1965), *Money, Interest and Prices*, New York: Harper and Row, second edition.

Samuelson, P. (1983), “Comment on Leijonhufvud”, in Worswick D. and J. Trevithick (eds.), *Keynes and the Modern World*, Cambridge: Cambridge University Press, pp. 212-217.

Skidelsky, R. (2009), *The Return of the Master*, London: Public Affairs.

Snowdon, B. and H. R. Vane (1998), “Transforming Macroeconomics: An Interview with Robert E Lucas Jr.”, *Journal of Economic Methodology*, vol. 5, pp. 115-145.

Solow, R. (1990), *The Labour Market as a Social Institution*, Cambridge: Blackwell.

Tinbergen, J. (1939), *Statistical Testing of Business Cycle Theories*, Geneva, League of Nations.

Weintraub, E. R. (1990), “Methodology does not Matter, but the History of Thought Might”, in S. Honkepohja (ed.), *The State of Macroeconomics. Proceedings of the Symposium, Whiter Macreoeconomics?*, Oxford: Oxford University Press, pp. 263-280.

Yeager, L. (1960), "Methodenstreit Over Demand Curves", *Journal of Political Economy*, vol. 68, pp. 53-64.

Institut de Recherches Économiques et Sociales
Université catholique de Louvain

Place Montesquieu, 3
1348 Louvain-la-Neuve, Belgique

ISSN 1379-244X D/2010/3082/030