

Introduction: Privileging micro over macro? A history of conflicting positions

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1. THE STANDARD NARRATIVE

Mainstream macroeconomists agree that we live in the age of microfoundations. The worldwide financial crisis of 2008 to the present may have emboldened critics of this microfoundational orthodoxy, but it remains the dominant view that macroeconomic models must go beyond supply and demand functions to “the level of objective functions, constraint sets, and market-clearing conditions” (Sargent 1982: 383). Only by doing this, the argument goes, can we truly understand “the way in which optimizing agents make their decision rules”, which in turn “depend on the dynamic environment in general, and the government policy rules in particular” (Sargent 1982: 383). The goal of the microfoundations project, as articulated in the 1980s, was to reincorporate “aggregative problems such as inflation and the business cycle within the general framework of ‘microeconomic’ theory” (Lucas 1987: 107). Microeconomics on this view is prior to macroeconomics, because “only when macroeconomic aggregates are explicable as consequences of well-formulated optimization problems for individuals ... will macroeconomic reasoning be secure” (Hoover 1988: 87; see also Backhouse 1995: ch. 8). The ultimate aim is the “euthanasia of macroeconomics” (Hoover 1988: 87; 2010: 331). As Robert Lucas puts it, if the microfoundations project succeeds, “the term ‘macroeconomic’ will simply disappear from use and the modifier ‘micro’ will become superfluous. We will simply speak ... of economic theory ...” (Lucas 1987: 107–108).

The priority of microeconomics appeared to the proponents of microfoundations as the inevitable consequence of the very notion of economics understood, as Lionel Robbins (1932) famously put it, as the study of choice under constraint.² It is probably no coincidence that microfoundations began to gain their greatest traction only in the 1970s since, as Backhouse and Medema (2009) have argued, Robbins’ definition finally conquered mainstream economics only at about that time.

The attitudes that were reflected in one side of the debate on microfoundations in the 1980s have become in the new millennium the common wisdom of macroeconomists. Michael Woodford's *Interest and Prices* (2003) is emblematic of the new consensus between new Keynesians and new classicals about macroeconomics needing microfoundations:

I consider the development of a model of the monetary transmission mechanism with clear foundations in individual optimization to be important for two reasons: It allows us to evaluate alternative monetary policies in a way that avoids the flaw in policy evaluation exercises using traditional Keynesian macroeconomic models stressed by Lucas (1976); and the outcomes resulting from alternative policies can be evaluated in terms of the preferences of private individuals that are reflected in the structural relations of one's model. ... My preference for this form of structural relations is precisely that they are ones that should remain invariant (insofar as the proposed theory is correct) under changes in policy that alter the stochastic laws of motion of the endogenous variables. ...

A second advantage of proceeding from explicit microeconomic foundations is that in this case, the welfare of private agents ... provides a natural objective in terms of which alternative policies should be evaluated. (Woodford 2003: 11–12)³

The standard narrative of the rise of microfoundations locates their origins in the work of Lucas and his new classical friends and followers in the 1970s (see Hoover, Chapter 1).⁴ Lucas and Rapping (1969) attempted to provide microeconomic underpinnings for the labor market in an otherwise Keynesian (IS-LM) model. This first attempt was “classical” in the sense of relying on a market-clearing framework. It was “new” in its emphasis on the importance of intertemporal choice in labor markets. However, for the lack of a more plausible hypothesis, they relied on adaptive expectations in their labor-market model, which did not please Lucas because agents could make systematic mistakes. In subsequent work, Lucas (1972a,b, 1973) introduced rational expectations, which he regarded as the natural consequence of the attempt to provide a general-equilibrium account of the macroeconomy. The notion of rational expectations as model-consistent, equilibrium, expectations has a general-equilibrium character. Sargent (1973) and Sargent and Wallace (1975) independently introduced rational expectations into an IS-LM model.

The rational expectations hypothesis seemed to require a general-equilibrium approach. The IS-LM model could be seen as an *aggregate* general-equilibrium model; but it was not, in itself microfoundational: its equations were not derived from the optimization problems of individual agents. Although Lucas and Rapping had explored models based on

optimization, it was only with Lucas's (1976) famous critique of econometric policy evaluation that rational expectations came to be seen to require models based on the optimization problems of individuals (models based on "first principles") and that microfoundations began to seem to be compulsory for macroeconomics. The target of Lucas's critique was the large-scale macroeconometric models that had emerged through the work of Lawrence Klein, among others, out of the work of Tinbergen in the 1930s and the Cowles Commission's econometric program of the 1940s and 1950s (a program discussed by Philip Mirowski, Chapter 4). The essence of the critique was that rational agents solved their optimization problems with knowledge of the prevailing policy regime. If an alternative policy were instituted, rational agents would have to solve a different optimization problem and the relationships among aggregate data, which are the economy-wide consequences of the solution of individual optimization problems, would change in response. It was not, therefore, acceptable to treat the estimated aggregate econometric relationships of the large-scale macroeconometric models as invariant under alternative policies, thus calling into question their use for evaluating macroeconomic policy.⁵

The Lucas critique provided an intellectual basis for the requirement that macroeconomic models possess precise microfoundations of a specific format; while the market-clearing assumptions preferred by the new classicals in conjunction with the rational-expectations hypothesis provided grounds for a vigorous rejection of the policy activism associated with Keynesian economics. As Kevin Hoover (Chapter 1) and Michel De Vroey (Chapter 5) discuss, Keynes was blamed for having "freed a generation of economists from the discipline imposed by equilibrium theory," a freedom that "was rapidly and fruitfully exploited by macroeconometricians" (Lucas 1977: 12) in their "nascent program of aggregative econometric modeling" (Hoover, Chapter 1, p. 19).

Lucas and his followers argued that macroeconomics could be secured against the Lucas critique only when it was grounded in adequate microfoundations, a belief that remains strongly held until today (as evidenced by the earlier quotation of Woodford 2003). The standard narrative sees Lucas as having inaugurated a new microfoundational era in macroeconomics and in policymaking. His work is seen to have naturally developed into the real business cycle models of Kydland and Prescott and their students and followers (for example, Kydland and Prescott 1982). Economists with a Keynesian orientation rejected market clearing as an acceptable basis for macroeconomics and, equally, insisted on the possibility of monetary and fiscal policies improving macroeconomic outcomes. Those who nonetheless accepted the Lucas critique and the microfoundational imperative that

it implied were transformed into “new Keynesians”. As a further development, the so-called dynamic stochastic general-equilibrium (DSGE) models, which were structurally related to real business cycle models, but flexible enough to incorporate Keynesian concerns, became the foundation for a “new neoclassical synthesis” (see Duarte, Chapter 6). While debates continue over the best model of the economy and its policy implications, the mainstream consensus among new Keynesians, as well as new classicals (and RBC theorists), uniformly embraces Lucas’s program of microfoundations for macroeconomics.

What should we think of the standard narrative? The operating premise in assembling the present volume was that the internal narrative of mainstream macroeconomics is likely to be unreliable, its principal function being to buttress a particular, historically contingent methodological argument. Our purpose in assembling the present volume is to step back and to re-examine the history of the relationship of microeconomics and macroeconomics without presupposing the truth of the standard narrative. We begin with the emergence of micro and macroeconomics as self-consciously distinct fields within economics in the early 1930s. The authors in this collection seek to get behind and beyond the potted history of the development of the fields that is often told and written by practicing economists. From different perspectives and entry points, they challenge the association of microfoundations with Lucas and rational expectations, and offer both a more complete and deeper reading of the very relationship between micro and macroeconomics. The chapters grew out of papers presented to the First International Symposium on the History of Economic Thought sponsored by the Economics Department of the University of São Paulo (USP), São Paulo, Brazil, on 3–5 August 2009. Its theme was “The Integration of Micro and Macroeconomics from a Historical Perspective.”⁶

2. BEYOND THE STANDARD NARRATIVE

Far from a new concern of the 1970s, microfoundations – or, at the least, the question of the relationship of microeconomics to macroeconomics – was actively discussed from nearly the moment that the distinction between micro and macroeconomics emerged in the 1930s. What was the right scale of analysis? Should the focus be on individual behaviour or on macroeconomic (aggregate) relationships? What kind of models can we use to analyse problems at each level? Are macroeconomic relationships consistent with microeconomic behavior? For example, what is the relationship of aggregate consumption and the individual’s consumption decision? How does an aggregate money demand function relate to an individual’s decision

over the division of his financial wealth between money and interest-bearing assets? Can fluctuations of inventories at the level of the firm explain fluctuations of overall economic activity? Can we aggregate individual decisions into a demand or supply function for output as a whole? How? And what properties do aggregate functions inherit from the individuals behind them? Putting these questions in a broader frame:

One crucial issue in the microfoundations literature is the extent to which aggregate economic variables and/or relationships exhibit features that are similar to the features of individual variables and/or relationships, and in particular whether certain features are emergent properties at the macro level that do not have a natural counterpart at the individual level. (Maarten C.W. Janssen 2008)

Such foundational issues concerning the relationship between micro and macroeconomics were bound to shape the economics produced since the 1930s. Against the standard narrative stands the fact that the term microfoundations was coined in the 1950s, well before Lucas's first forays into macroeconomics challenged the mainstream (see Hoover, Chapter 1). Microfoundations was an integral part of the discussions within general equilibrium theory, as well as a central concern of critical alternatives to Walrasian general equilibrium theory (see Weintraub 1979, ch. 7, and Harcourt 1977). Microfoundations was already an established concern when Phelps convened the conference that led to the first book to bear the title "microeconomic foundations" (Phelps 1970). Although Lucas and Rapping (1970) participated in that conference and it ultimately proved to be a key event in the establishment of the representative-agent approach to microfoundations, the approach to microfoundations was by no means the approach of the standard narrative (see Hoover, Chapter 1). Phelps characterized the volume as a "new kind of microeconomics of production, labor supply, wage and price decisions" intended "to found a theory of aggregate supply, in that it sticks doggedly to the neoclassical postulates of lifetime expected utility maximization and net worth maximization, [while] it makes no appeal to faulty perceptions and it does not fundamentally require that price-setters economize on their decision-making time." The goal was to illuminate "some old problem areas in Keynesian economics" (Phelps 1970: 3).⁷

In their own contribution to the volume, Phelps and Winter tried to go beyond Walrasian, perfectly competitive, general equilibrium theory. While they recognized that "the agenda of unfinished business is enormous" (Phelps and Winter 1970: 336), they concluded that "a landing on the

non-Walrasian continent has been made. Whatever further exploration may reveal, it has been a mind-expanding trip..." (Phelps and Winter 1970: 337).

Nor were the concerns with microfoundations unique to the participants in Phelps's conference. The problem of the consistency of aggregate outcomes with individual optimization behavior also animated the so-called general disequilibrium analysis associated with the works of Don Patinkin ([1956] 1965), Robert Clower (1965, 1967), Axel Leijonhufvud (1968), Robert Barro and Herschel Grossman (1971, 1976), Edmond Malinvaud (1977), and others.

Although many economists before the 1960s understood microeconomics and macroeconomics as part of a division of labor in which separate questions were addressed with distinct tools and models, other economists from the very beginnings of the micro/macro distinction in the 1930s and, especially, in the period of the "neoclassical synthesis" starting in the mid-1950s, tried to link those fields through general equilibrium models (Weintraub 1974: 49; Leijonhufvud 1992: 28; Laidler 2008: 1–3).⁸ The basic idea was that one could start with individual behaviors and somehow aggregate them up to form aggregate relationships. These efforts faced major challenges: How could expectations be integrated into the models? Was there room for money? For unemployment? The technical problems were daunting, but resolving them would be essential if general equilibrium models were to be made practically useful to address the traditional concerns of macroeconomics – for example, the relationship of inflation and involuntary unemployment.⁹

E. Roy Weintraub nicely summarized the general equilibrium theory of the neoclassical synthesis:

For many years the division between microeconomics and macroeconomics has been detailed and condemned by economists, while the link between the two, general equilibrium theory, has suffered from a curious form of neglect. Although it has been well understood that macroeconomic structures could be "aggregated up" from general systems models, this insight remained so unworldly; concern for axiomatisation of production relations in a timeless barter world, while not uninteresting, cannot be the hallmark of a worldview flexible enough to cope with problems of inflation or involuntary unemployment.

Yet it is to the credit of various general equilibrium theorists that such important concerns were never so far from their analytic work that they ignored completely the macro implications of their models. ... If it is true, as many observe, that time and money are essential characteristics of actual economic systems, general equilibrium theory cannot be faulted for its inattention to these details, though its meager and sometimes confusing conclusions can be derided. (Weintraub 1974: 49)

The neoclassical synthesis brought with it a new interpretation of the history of macroeconomics. Keynes's *General Theory* and Keynesian economics were reduced to a special case of the general equilibrium theory, one that was "hardly worth even a footnote" (Weintraub 1974: 54). The most important macroeconomic issues were not seen as fundamental. While Patinkin ([1956] 1965), for instance, offered an integration of money into the general equilibrium model, such outcomes as involuntary unemployment could be explained only through *deviations* from normal functioning of market mechanisms – for example, either through wage rigidity in the labor market or the irrationality of workers who are off their supply curves.

Of course, the reduction of macroeconomics to a secondary role was not acceptable to all. Keynesian economists "have clearly understood why the neoclassical prism distorts the Keynesian vision" (Weintraub 1974: 54) and some, like Robert Clower and Frank Hahn among others, tried to build general equilibrium models in which Keynes was not a mere footnote (see Weintraub 1974: 54–6).¹⁰ Hoover (Chapter 1) argues that Barro and Grossman (1971, 1976) and Malinvaud (1977) "popularized the non-Walrasian models as aggregative, general disequilibrium models with representative agents" (p. 38), but this general disequilibrium theory is not linked closely to the microfoundations as understood by the standard narrative. Disequilibrium models provide but one example of how market clearing, representative-agent microfoundations eclipsed alternative approaches. Several economists represented in the Phelps volume approached the microfoundations of aggregate supply not through the representative-agent model, but through search models. Phelps (1970: 6) proposed to "picture the economy as a group of islands between which information flows are costly": the "island model," as it came to be known later, is one in which an individual producer cannot distinguish perfectly whether a signal of a higher price for his good indicates an increase in a relative price, which would stimulate him to produce more, or an increase in the general price level, which would leave his supply decision unaltered.¹¹

As Hoover (Chapter 1) shows, the great boom in explicit discussions of microfoundations is traceable to the early 1970s when a variety of competing approaches were in play. The Phelps volume was a key contribution. And it was reinforced by Weintraub's survey article in the *Journal of Economic Literature* (1977), subsequently developed into a book (1979), as well as by Geoffrey C. Harcourt's (1977) edited conference volume. Although Weintraub's article and book and Harcourt's edited volume focus on aspects of microfoundations different from those emphasized by Phelps,

the two names most closely associated with microfoundations in the journals are Phelps and Lucas, with Lucas's importance growing relatively over time (Hoover, Chapter 1, Table 1).

Although microfoundations had been a concern of macroeconomics from the early 1930s, even before the term "microfoundations" became current and even though competing approaches were on the table in the 1970s, the various threads of the microfoundations literature subsequently drifted apart and lost contact with each other.

Lucas's thread, as already mentioned, advocated that the optimizing behavior of individual agents determined the aggregate outcome. But the task was by no means trivial. The theorems of Hugo Sonnenschein, Rolf Mantel and Gerard Debreu in the early 1970s established that the restrictions that generate well-behaved individual demand functions do not constrain aggregate demand functions to exhibit the same properties (see Wade Hands, Chapter 3, and Rizvi 1994). The new classicals sidestepped the problem of aggregation either by imagining an economy composed of identical individuals or by assuming that there is one individual who represents the whole economy, so that the solution to the optimization problem of this *representative agent* gives the aggregate relationships in that economy. In fact, they adopted the representative-agent model from the optimal-growth literature of the 1960s.

Using such models, Lucas and others developed the characteristic conclusions of the new classical school, such as the ineffectiveness of monetary policy with respect to the real economy (see Hoover 1988). Policy ineffectiveness was widely regarded by Keynesians as a politically conservative conclusion. Initially, it was interpreted as a direct consequence of the rational-expectations hypothesis, which was then regarded as politically suspect. Later, economists came to see that the assumptions of flexible prices and perfect competition were the critical factors in the policy ineffectiveness proposition. Once a wedge had been driven between policy ineffectiveness and the assumption of rational expectations, the rational-expectations hypothesis was accepted by a wider spectrum of macroeconomists (see Duarte, Chapter 6). New Keynesians found that rational expectations did not rule out an important role for the government in stabilizing the economy.

The use of the representative agent was rarely, if at all, explicitly justified and despite the efforts by some macroeconomists to introduce heterogeneous agents into their models, it became the benchmark model that provides the framework for most mainstream business-cycle models of the present day. What is important to the theme of this volume is that the representative-agent framework proposes a particular way of relating microeconomics to macroeconomics – and it is neither the only way nor the

first way proposed. It is what Hoover (Chapter 1) calls “eliminative micro-foundations” – that is, microfoundations which ultimately aim to eliminate macroeconomics in favor of microeconomics rather than to explain the relationship of microeconomics and macroeconomics, while acknowledging their independent utility. The representative agent begs the question of aggregation, simply ignoring the difficulties highlighted in the analyses of Sonnenschein, Mantel and Debreu discussed above. Leijonhufvud (1992: 28) captures well the eliminativist ambitions of the representative-agent approach:

Those of us who came out of graduate programmes in the early 1960s had been taught a micro and a macro theory that could not have applied to the same world at the same time. So this problem was of intense concern to many of us. Our label for it was “microfoundations of macroeconomics”. Quite a lot was written about it at one time (cf. Weintraub 1979).

Robert Lucas resolved this tension between micro and macro by declaring that the problem did not really exist. The appearance of a problem was due simply to the fact that macroeconomics had not been done right. The microfoundations problem would evaporate once we decided to do macro theory in strict obedience to micro-theoretical modelling principles.

The representative-agent approach was adopted not only by new classicals, such as Lucas, and their natural successors, such as the real-business cycle theorists, including Edward Prescott and Finn Kydland, but also by new Keynesians such as N. Gregory Mankiw, David Romer, and Olivier Blanchard. Although these two groups differed over many points of economic substance (such as the source of business cycles and the role of government over them), they both responded similarly to the Lucas critique: macroeconomics requires sound microfoundations; sound microfoundations require general equilibrium models in which optimizing agents have rational expectations.¹² The methodological consensus (the “new neo-classical synthesis”) of the late 1990s replaced the sharp substantive debates of the 1970s and 1980s (see Duarte, Chapter 6). Most new neoclassical models employ the representative agent. Mainstream macroeconomics is now defined not only by microfoundations, but by a particular type of microfoundations (Hoover, Chapter 1).

James Tobin had already noted the hegemony of microfoundations in the macroeconomics of the mid-1980s:

[with] [t]his [microfoundations] counter-revolution [that] has swept the profession until now it is scarcely an exaggeration to say that no paper that does not employ the “microfoundations” methodology can get published in a major professional journal, that no research proposal that is suspect of violating its precepts can survive peer review, that no newly minted Ph.D. who can’t show

that his hypothesized behavioral relations are properly derived can get a good academic job. (Tobin 1986: 350)

But not any microfoundations would do. And representative-agent microfoundations increasingly dominated other approaches, largely ignoring problems of coordination, heterogeneity among individuals, and financial imperfections. Yet it is these features that have been targeted (implicitly or explicitly) by critics of modern macroeconomics during the financial and economic crisis that started in 2007.¹³ An open question, therefore, is whether a methodological turn undermined the ability of macroeconomics to respond to pressing policy issues.

The hegemonic claims of microfoundations are most often justified with reference to the sort of problems highlighted by the Lucas critique. But what justifies the hegemony of the representative agent? Mainstream macroeconomists are rarely explicit on this question; but, implicitly, the argument seems to be that the assumption of a representative, optimizing, agent is mainly technical – both a compromise between the ambitions and the computational capacities of the macroeconomist and a convenient way to introduce a welfare measure for the evaluation of economic policy.¹⁴ The implicit argument is what Hoover refers to as “eschatological justification”: “the representative-agent model is but the starting point for a series of fuller and richer models that eventually will provide the basis for an adequate macromodel, and that, therefore, the current generation of models is entitled to credence” (Hoover 2006: 146, which is a comment on Woodford 2003). Mainstream macroeconomists frequently take a defensive attitude towards their modeling choices and tend not to discuss in detail the limitations they imply. Important exceptions include Ricardo Caballero (1992, 2010) and Solow (2008). Although V.V. Chari (2010: 3) tried to defend mainstream macroeconomics against the charge that it is all about representative agents by stating that “any claim that modern macro is dominated by representative agent models is wrong,” the existing literature of heterogeneous-agent models has hardly been integrated into the kind of models that mainstream macroeconomists have tried to bring to policy-making (Duarte, Chapter 6).¹⁵ What is more, Chari’s conception of what constitutes the representative-agent assumption is limited. A few types of agents, each representing some larger class of heterogeneous agents, raise issues hardly different from those raised by a single representative agent.

Unlike mainstream macroeconomists, heterodox economists, as well as methodologists and philosophers have demonstrated a deep interest both in the particular limitations of the representative agent and in the broader issues of microfoundations and the relationship between micro and macroeconomics.¹⁶ Historians of economics, however, have not delved deeply

into these issues, the main exceptions being Weintraub's (1979) Lakatosian analysis and David Laidler's (2008) reading of the development of macroeconomics and the neoclassical synthesis through the works of Axel Leijonhufvud. The present volume thus tills relatively fallow ground. It brings together a renowned group of historians who have previously worked on diverse but related problems to attempt to shed historical light on how economists dealt with foundational questions, roughly since the 1930s, and how over time they came to understand the relationship of micro and macroeconomics after it was clearly articulated by Ragnar Frisch.

Microfoundations à la Lucas provides one answer to the question of the relation of micro to macroeconomics, one that assigns priority to the micro over the macro. The priority of microeconomics was already implicit in the criticisms that Wassily Leontief (1936) directed to Keynes's *General Theory*, reading it against a general equilibrium model. But this is far from being the only option when addressing the relationship: for Frisch, writing in the 1930s, macroeconomics (or macrodynamics, as he more commonly refers to it) takes priority over microeconomics because the microeconomics "is an analysis by which we try to explain in some detail the behaviour of a certain section of the huge economic mechanism, *taking for granted that certain general parameters are given*" (Frisch 1933: 172, emphasis added). The macroeconomic environment is a requirement for microeconomic analysis, and it is here represented by the fixity of background parameters. Furthermore, Frisch built a simplified macroeconomic model that ignored the many details of the entire economy due to the limitations of data and analytical capacity (Hoover, Chapter 1). His view was that interdependence among "sections of the [economic] system" (1933: 173) is what distinguishes macrodynamics from microdynamics, not the scaled up relationships that result from aggregating individual decisions in a Walrasian general-equilibrium model.

The central issues in understanding the relationship between micro and macroeconomics are thus the direction of influence, the independence or coexistence of the two fields, and whether one field effectively eliminates or dominates the other.

The current volume then addresses a host of related historical questions:

- First, how do we identify and understand historically alternative microfoundational programs? This is the main question addressed by Hoover (Chapter 1) and is central to rejecting the standard narrative that treats microfoundations as a creature of the Lucas critique and the new classical macroeconomics in the 1970s.
- Second, how does the variety of approaches to microeconomics shape microfoundations? According to Robert Leonard (Chapter 2),

Oskar Morgenstern, for example, resisted Walrasian general equilibrium analysis. From his Austrian upbringing, through his Princeton period, to collaboration with von Neumann, Morgenstern saw the central issue as how to treat time and expectations in economics. Morgenstern rejected the view of many economists that general equilibrium theory was a middle ground between the micro and macroeconomics.

- Third, can general equilibrium be seen legitimately as emerging at the boundary between the micro and macroeconomics divide? Wade Hands (Chapter 3) argues that historically it has been a two-way street, a co-evolution that resulted in the emergence of both a particular kind of Keynesian economics that drew on insights from general equilibrium theory and a kind of general equilibrium theory that stabilized in response to the macroeconomics of the 1950s and 1960s.
- Fourth, how does the problem of microfoundations relate to contemporary developments in other fields of economics? Econometrics, for example, was founded as a distinct discipline at precisely the same time – and to a large extent by the same people – as micro and macroeconomics. And developments in econometrics were central to the evolution of microfoundations. In particular, the dominance of the Lucas program is intimately related to his econometric criticism of Keynesian macroeconomic models. Philip Mirowski (Chapter 4) argues that Keynes's economics had to be divested of much of his content to be expressed, in the US, in a general-equilibrium, quantitative model with microfoundations usable for policy analysis. He focuses on the reaction to Keynes in the citadel of postwar Walrasian economics in the US, namely, the Cowles Commission, which was, at the same time, the key player in the foundation of modern econometrics. (Aspects of this story are also discussed by Hoover, Chapter 1, and De Vroey, Chapter 5.) Mirowski concludes that, unlike the other pro-Keynesian schools in America, such as Paul Samuelson's Massachusetts Institute of Technology (MIT), the Cowles Commission during its Chicago incarnation (1943–54) was lukewarm towards Keynes. Mirowski argues, therefore, that there were fewer genuine Keynesians among postwar neoclassical American economists than is usually believed.
- Fifth, what light does the history of microfoundations shed on current macroeconomic practice? De Vroey (Chapter 5) addresses the literature on real-business-cycle models, while Duarte (Chapter 6) examines the new neoclassical synthesis. The challenge in both cases is to re-examine the standard narrative of microfoundations, and especially how that relates to the role of macroeconomics in the recent

worldwide financial crisis, from a more historical perspective. De Vroey enlarges on the transformation of the new classical macroeconomics of the 1970s into the real-business-cycle modeling program of the 1980s and 1990s. Economic policy emerges as a central theme in both chapters. De Vroey probes the responses of the real-business-cycle school to the Lucas critique and their construction of microfoundations that effectively support earlier policy-ineffectiveness propositions. Duarte, in contrast, argues that new neoclassical synthesis models, which grew out of similar roots, nonetheless revived macroeconomic policy analysis.

Despite the fact that the need for macroeconomic models to have microfoundations has now become unassailable dogma among mainstream macroeconomists, those same economists have very rarely engaged in explicit reflection on the relationship between micro and macroeconomics, and the limitations inherent to the ways they proposed to integrate these fields. Many of the shortcomings of macroeconomic modeling that have been raised by critics in relationship to the recent financial crisis – the lack of focus on heterogeneity and coordination problems, the inadequacy of the standard representation of the financial system, the failure to address the possibility of systemic market failure – are related, in part, to the particular ways in which mainstream macroeconomics has attempted to provide microfoundations. The aim of the present volume is to provide a historical perspective on how the central dogma of current macroeconomics came to be, and to explore how the essential questions about the relationship between micro and macroeconomics were first posed and resolved: Which possibilities were once open? Which avenues were closed and why? Why did current mainstream views come to dominate? While it is not the purpose of historians to say what should be done next, it is our hope that a rich understanding of historical context may clarify pressing issues for the current generation of macroeconomists. We recognize, however, that this story is far richer than can be addressed in a single volume. We hope that our fellow historians will regard it as an introduction, an invitation to further exploration of some of the most important foundational questions in modern economics.

NOTES

1. In writing this introduction we greatly benefited from many conversations we had with Kevin Hoover, Michel De Vroey and Perry Mehrling. We are grateful to them for this, without implying that they agree with the final outcome. Hoover was not only very supportive and willing to contribute, but also made several suggestions to improve the

structure and fluency of the text for which he deserves our very special gratitude. We also gratefully acknowledge research funding provided by the Brazilian National Council of Scientific and Technological Development (CNPq).

2. Robbins (1932, 15) defined economics as “the science which studies human behavior as a relationship between ends and scarce means which have alternative uses”. He emphasized that “when time and the means for achieving ends are limited *and* capable of alternative application, then behavior necessarily assumes the form of choice” (13), which is then “the unity subject of Economic Science” (15).
3. John B. Taylor (1989, S170) had made earlier a similar point (though with less emphasis on explicit microfoundations): “One of the purposes of developing quantitative rational expectations models is that they can deal with the Lucas critique which says that the equations of traditional non-rational expectations models might change if the policy rule changed.”
4. References to chapters in the present volume are identified by number without dates.
5. Lucas and Sargent (1979, 55) emphasized the role of rational expectations in their criticism to the Keynesian macroeconomic models: “The casual treatment of expectations is not a peripheral problem in these models, for the role of expectations is pervasive in the models and exerts a massive influence on their dynamic properties (a point Keynes himself insisted on). The failure of existing models to derive restrictions on expectations from any first principles grounded in economic theory is a symptom of a somewhat deeper and more general failure to derive behavioral relationships from any consistently posed dynamic optimization problems.”
6. The full program of this symposium as well as the videos of all sessions are available online at: <http://www.usp.br/feaecon/ishet/index.htm>. A subset of these papers (Hoover, Hands, Mirowski, and Duarte) was then presented at the 2010 Annual Meeting of the Allied Social Science Associations (ASSA) in Atlanta and benefited from the comments by Perry Mehrling.
7. Hoover (Chapter 1) states that the publication of the Phelps (1970) book “was the watershed event in the establishment of the representative-agent microfoundational program” (p. 46).
8. There are diverse meanings that economists attribute to the term “neoclassical synthesis.” Here, as in Weintraub (1974, 52), it means “the marriage of modern monetary theory to the ‘classical’ (meaning Walrasian) general equilibrium (or value) theory”.
9. The struggle to find room for money in general equilibrium led Frank Hahn to state in the late 1960s that “Economic Theory still lacks a ‘Monetary Debreu’” (Hahn 1969, 172) – a situation that he still regarded as unsatisfactory in the early 1980s (Hahn 1982, 1). In the 2010 ASSA meeting at which preliminary versions of some of the papers in this volume were presented, Perry Mehrling argued that before the emergence of macroeconomics it was in monetary economics that the overall price level and its relation to business fluctuations were analysed (relative prices and real allocations were part of value or price theory). Although “monetary economics is the historical origin of macroeconomics, ... monetary economics has no obvious connection to microeconomics”. Hicks (1935, [1939] 1946) began the effort of bridging the gap between monetary (macro) and microeconomics by recasting money in the same supply-and-demand framework that he applied to the general equilibrium of the real economy, which eventually led to the absence of money in the Arrow-Debreu version of the Walrasian general equilibrium model (for reasons demonstrated by Hahn). Mehrling then suggests that “in a larger context, the project to find *micro* foundations for macro was part of a longer process of knocking macro off of its original *monetary* foundations.”
10. This volume does not address another strand in the literature. Post-Keynesian economists, in particular, rejected the idea that individualistic general-equilibrium models were compatible with macroeconomics (Weintraub 1979, ch. 1). Some argued for an alternative microeconomics that could provide underpinnings compatible with the central concerns of Keynes’s theory: uncertainty and expectations. It was impossible to resolve

- the micro/macro split “without abandoning either general equilibrium theory or Post-Keynesian economics” (Weintraub 1979, 13). See Janssen (2008) for a brief summary of and a few references to non-mainstream approaches to microfoundations of macroeconomics.
11. Phelps (1970, 6–10) talked about workers in different islands facing such a decline in the demand for labor that they cannot know if it is due to an overall decrease of aggregate demand or not. He interprets several papers in his volume as following this island story (and his own contribution with Winter follows this non-Walrasian general equilibrium model). Lucas (1972a, 104) takes Phelps as the forerunner of his approach and is considered to be the creator of a formal “island model”. However, he does not use such a metaphor in this paper.
 12. Drazen (1980, 293) had emphasized earlier the need to explain macroeconomic phenomena in a general-equilibrium model based on choice theoretical behavior: “Explanations of macroeconomic phenomena will be complete only when such explanations are consistent with microeconomic choice theoretic behavior and can be phrased in the language of general equilibrium theory.”
 13. See Colander, Howitt, Kirman, Leijonhufvud and Mehrling (2008), Duarte (2011) and references therein for criticisms of modern macroeconomics during the current recession.
 14. See Woodford (2003, 11–12), quoted above, on the use of the representative agent to provide a welfare measure. Robert Solow (2000, 152) warned against this practice.
 15. Examples of these representative models aimed to policymaking include Christiano, Eichenbaum and Evans (2005) and Smets and Wouters (2007).
 16. An incomplete selection includes: Nelson (1984), Janssen (1991, 1993, 2008), Kirman (1992, 2006), Leijonhufvud (1993), Rizvi (1994), the several authors who contributed to the volume edited by Colander (1996), Hartley (1997), Forni and Lippi (1998), Horwitz (2000), van den Bergh and Gowdy (2003), Colander, Howitt, Kirman, Leijonhufvud, and Mehrling (2008), and Hoover (2009, 2010).

REFERENCES

- Backhouse, Roger E. (1995). *Interpreting Macroeconomics: Explorations in the History of Macroeconomic Thought*. London: Routledge.
- Backhouse, Roger E., and Steve G. Medema (2009). Defining Economics: The Long Road to Acceptance of the Robbins Definition. *Economica*, 76 (Supplement):805–20.
- Barro, Robert J., and Herschel I. Grossman (1971). A General Disequilibrium Model of Income and Employment. *American Economic Review*, 61 (1):82–93.
- Barro, Robert J., and Herschel I. Grossman (1976). *Money, Employment and Inflation*. Cambridge: Cambridge University Press.
- Caballero, Ricardo J. (1992). A Fallacy of Composition. *American Economic Review*, 82 (5):1279–92.
- Caballero, Ricardo J. (2010). Macroeconomics After the Crisis: Time to Deal with the Pretense-of-knowledge Syndrome. *NBER working paper*, no. 16429.
- Chari, V.V. (2010). *Testimony before the Committee on Science and Technology*. Subcommittee on Investigations and Oversight, U.S. House of Representatives, July 20. Washington, D.C. (available at: http://science.house.gov/publications/hearings_markup_details.aspx?NewsID=2916, accessed on Oct. 13, 2010).
- Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans (2005). Nominal Rigidities and the Dynamic Effects of a Shock to Monetary Policy. *Journal of Political Economy*, 113 (1):1–45.

- Clower, Robert W. (1965). The Keynesian Counterrevolution: A Theoretical Appraisal. In *The Theory of Interest Rates*. Edited by F.H. Hahn, and F.P.R. Brechling. London: Macmillan.
- Clower, Robert W. (1967). A Reconsideration of the Microfoundations for Monetary Theory. *Western Economic Journal*, 6 (1):1–8.
- Colander, David (ed.) (1996). *Beyond Microfoundations: Post Walrasian Macroeconomics*. Cambridge: Cambridge University Press.
- Colander, David, Peter Howitt, Alan Kirman, Axel Leijonhufvud, and Perry Mehrling (2008). Beyond DSGE Models: Toward an Empirically Based Macroeconomics. *American Economic Review, papers and proceedings*, 98 (2):236–40.
- Drazen, Allan (1980). Recent Developments in Macroeconomic Disequilibrium Theory. *Econometrica*, 48 (2):283–306.
- Duarte, Pedro Garcia (2011). Recent Developments in Macroeconomics: The DSGE Approach to Business Cycles in Perspective. In *The Elgar Companion to Recent Economic Methodology*. Edited by John B. Davis, and D. Wade Hands. Cheltenham, UK: Edward Elgar, pp. 375–403.
- Forni, Mario, and Marco Lippi (1998). *Aggregation and the Microfoundations of Dynamic Macroeconomics*. Oxford: Oxford University Press.
- Frisch, Ragnar (1933). Propagation Problems and Impulse Problems in Dynamic Economics. In *Economic Essays in Honor of Gustav Cassel*. London: George Allen and Unwin.
- Hahn, Frank (1969). On Money and Growth. *Journal of Money, Credit and Banking*, 1 (2):172–87.
- Hahn, Frank (1982). *Money and Inflation*. Oxford: Basil Blackwell.
- Harcourt, Geoffrey C. (ed.) (1977). *The Microeconomic Foundations of Macroeconomics*. Boulder: Westview Press.
- Hartley, James E. (1997). *The Representative Agent in Macroeconomics*. London: Routledge.
- Hicks, John R. (1935). A Suggestion for Simplifying the Theory of Money. *Economica*, 2 (5):1–19.
- Hicks, John R. ([1939] 1946). *Value and Capital: An Inquiry Into Some Fundamental Principles of Economic Theory*. 2nd edn. Oxford: Clarendon Press.
- Hoover, Kevin D. (1988). *The New Classical Macroeconomics: A Sceptical Inquiry*. Oxford: Basil Blackwell.
- Hoover, Kevin D. (2006). A Neowicksellian in a New Classical World: The Methodology of Michael Woodford's Interest and Prices. *Journal of the History of Economic Thought*, 28 (2):143–9.
- Hoover, Kevin D. (2009). Microfoundations and the Ontology of Macroeconomics. In *Oxford Handbook of the Philosophy of Economic Science*. Edited by Harold Kincaid, and Donald Ross. Oxford: Oxford University Press.
- Hoover, Kevin D. (2010). Idealizing Reduction: The Microfoundations of Macroeconomics. *Erkenntnis*, 73 (3):329–47.
- Horwitz, Steven (2000). *Microfoundations and Macroeconomics: An Austrian Perspective*. London: Routledge.
- Janssen, Maarten C.W. (1991). What is this Thing called Microfoundations? *History of Political Economy*, 23 (4):687–712.
- Janssen, Maarten C.W. (1993). *Microfoundations: A Critical Inquiry*. London: Routledge.
- Janssen, Maarten C.W. (2008). Microfoundations. In *The New Palgrave Dictionary of Economics*. 2nd edn. Edited by Steven N. Durlauf, and Lawrence E. Blume.

- Palgrave Macmillan (available as *The New Palgrave Dictionary of Economics Online*. Palgrave Macmillan. Accessed 12 March 2012: http://www.dictionarofeconomics.com/article?id=pde2008_M000380).
- Kirman, Alan P. (1992). Whom or What Does the Representative Individual Represent? *Journal of Economic Perspectives*, 6 (2):117–36.
- Kirman, Alan P. (2006). Demand Theory and General Equilibrium: From Explanation to Introspection, a Journey down the Wrong Road. *History of Political Economy*, 38 (Annual Supplement):246–80.
- Kydland, Finn E., and Edward C. Prescott (1982). Time to Build and Aggregate Fluctuations. *Econometrica*, 50 (6):1345–70.
- Laidler, David (2008). Axel Leijonhufvud and the Quest for Micro-Foundations: Some Reflections. In Roger E.A. Farmer (ed.), *Macroeconomics in the Small and the Large: Essays on Microfoundations, Macroeconomic Applications and Economic History in Honor of Axel Leijonhufvud*. Cheltenham, UK: Edward Elgar.
- Leijonhufvud, Axel (1968). *On Keynesian Economics and the Economics of Keynes: a Study in Monetary Theory*. New York: Oxford University Press.
- Leijonhufvud, Axel (1992). Keynesian Economics: Past Confusions, Future Prospects. In *Macroeconomics – a Survey of Research Strategies*. Edited by Alessandro Vercelli, and Nicola Dimitri. Oxford: Oxford University Press.
- Leijonhufvud, Axel (1993). Towards a Not-Too-Rational Macroeconomics. *Southern Economic Journal*, 60 (1):1–13.
- Leontief, Wassily W. (1936). The Fundamental Assumption of Mr Keynes' Monetary Theory of Unemployment. *Quarterly Journal of Economics*, 51 (1):192–7.
- Lucas, Robert E., Jr. (1972a). Expectations and the Neutrality of Money. *Journal of Economic Theory*, 4 (2):103–24.
- Lucas, Robert E., Jr. (1972b). Econometric Testing of the Natural Rate Hypothesis. Reprinted in *Studies in Business-Cycle Theory*. Oxford: Blackwell, 1981.
- Lucas, Robert E., Jr. (1973). Some International Evidence on Output-Inflation Tradeoffs. *American Economic Review*, 63 (3):326–34.
- Lucas, Robert E., Jr. (1976). Econometric Policy Evaluation: A Critique. *Carnegie-Rochester Conference Series on Public Policy*, 1:19–46.
- Lucas, Robert E., Jr. (1977). Understanding Business Cycles. *Carnegie-Rochester Conference Series on Public Policy*, 5:7–29.
- Lucas, Robert E., Jr. (1987). *Models of Business Cycles*. Oxford: Blackwell.
- Lucas, Robert E., Jr., and Leonard A. Rapping (1969). Real Wages, Employment, and Inflation. *Journal of Political Economy*, 77 (5):721–54.
- Lucas, Robert E., Jr., and Leonard A. Rapping (1970). Real Wages, Employment, and Inflation. In Edmund S. Phelps (ed.) (1970), pp. 257–308.
- Lucas, Robert E., Jr., and Thomas Sargent (1979). After Keynesian Macroeconomics. *The Federal Reserve Bank of Minneapolis Quarterly Review*, 3 (2):49–72
- Malinvaud, Edmond (1977). *The Theory of Unemployment Reconsidered*. Oxford: Basil Blackwell.
- Nelson, Alan (1984). Some Issues Surrounding the Reduction of Macroeconomics to Microeconomics. *Philosophy of Science*, 51 (4):573–94.
- Patinkin, Don ([1956] 1965). *Money, Interest and Prices*. 2nd edn. New York: Harper and Row.
- Phelps, Edmund S. (ed.) (1970). *Microeconomic Foundations of Employment and Inflation Theory*. New York: Norton.

- Phelps, Edmund S., and Sidney G. Winter (1970). Optimal Price Policy under Atomistic Competition. In Edmund S. Phelps (ed.) (1970), pp. 309–37.
- Rizvi, S. Abu T. (1994). The Microfoundations Project in General Equilibrium Theory. *Cambridge Journal of Economics*, 18 (4):357–77.
- Robbins, Lionel (1932). *An Essay on the Nature and Significance of Economic Science*. London: Macmillan.
- Sargent, Thomas J. (1973). Rational Expectations, the Real Rate of Interest, and the Natural Rate of Unemployment. *Brookings Papers on Economic Activity*, 1973 (2):429–72.
- Sargent, Thomas J. (1982). Beyond Demand and Supply Curves in Macroeconomics. *American Economic Review*, 72 (2):382–9.
- Sargent, Thomas J., and Neil Wallace (1975). Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule. *Journal of Political Economy*, 83 (2):241–54.
- Smets, Frank, and Raf Wouters (2007). Shocks and Frictions in US Business Cycles: A Bayesian DSGE Approach. *American Economic Review*, 97 (3):586–606.
- Solow, Robert M. (2000). Toward a Macroeconomics of the Medium Run. *Journal of Economic Perspectives*, 14 (1):151–8.
- Solow, Robert M. (2008). The State of Macroeconomics. *Journal of Economic Perspectives*, 22 (1):243–6.
- Taylor, John B. (1989). Monetary Policy and the Stability of Macroeconomic Relationships. *Journal of Applied Econometrics*, 4 (Supplement):S161–S178.
- Tobin, James (1986). The Future of Keynesian Economics. *Eastern Economic Journal*, 12 (4):347–56.
- van den Bergh, Jeroen C., and John M. Gowdy (2003). The Microfoundations of Macroeconomics: An Evolutionary Perspective. *Cambridge Journal of Economics*, 27 (1):65–84.
- Weintraub, E. Roy (1974). *General Equilibrium Theory*. London: Macmillan.
- Weintraub, E. Roy (1977). The Microfoundations of Macroeconomics: A Critical Survey. *Journal of Economic Literature*, 15 (1):1–23.
- Weintraub, E. Roy (1979). *Microfoundations – The Compatibility of Microeconomics and Macroeconomics*. Cambridge: Cambridge University Press.
- Woodford, Michael (2003). *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton: Princeton University Press.