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978-1-107-02319-2 - Transforming Modern Macroeconomics: Exploring Disequilibrium  
Microfoundations, 1956–2003

Roger E. Backhouse and Mauro Boianovsky

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## ONE

## Introduction

## THE SEARCH FOR MICROFOUNDATIONS

This book tells the story of the search that took place, in the second half of the twentieth century, for a more rigorous macroeconomic theory. This was a time when many developments in macroeconomic theory were driven by economic events and by new policy challenges. In the 1960s, economists needed to explain economic growth – why some countries grew rapidly and others remained poor – and why prices were rising even when the shortages associated with the Korean War had ended. After 1973, the problem of stagflation, simultaneously rising inflation and unemployment, suddenly emerged, making the need for new theories even more urgent. However, the shape of the new theories that emerged was driven just as much by the concern, shared by most economists, to develop a macroeconomic theory that could be derived rigorously from theories about how individual households and firms responded to the circumstances they faced. In the language that economists started using in the 1970s, they sought a macroeconomic theory that had rigorous microfoundations.

The approach to the problem of microfoundations that was to become dominant involved modeling households and firms as optimizing agents, operating in perfectly competitive markets. Most economists took this as an approach with which they had to engage, even if they did not agree with it and wanted to work with other types of model. The most rigorous instantiation of this theory was the theory of general competitive equilibrium, in which formal axiomatic methods were used to analyze equilibrium in models with arbitrary numbers of agents and very general assumptions about technology and consumers' preferences. Using miniature general equilibrium models involving one or two "representative" agents, many macroeconomists concluded that, unless people had limited information

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(a situation that would not last very long, because people would learn from experience) the economy must be in equilibrium: the combination of optimizing agents and competitive markets implied that supply must equal demand in all markets. The concept of involuntary unemployment, the essence of which is that the supply of labor exceeds demand, did not make sense. The most prominent work in this genre was the new classical macroeconomics and, shortly after that, real business cycle theory. Although these models were very different from his, this conception of equilibrium was widely named “Walrasian,” after the nineteenth-century pioneer of general equilibrium theory Léon Walras, whose *Elements d’économie politique pure* (1874), was taken to have originated this approach. The approach contrasted with the Keynesian models that, prior to the 1970s, formed the basis on which the macroeconomic consensus rested.

However, the search for microfoundations, which was well under way long before the 1970s, for reasons that clearly had nothing to do with the macroeconomic challenges of that period, also involved economists who argued that Walrasian models were not suitable for analyzing the real world. These economists sought to derive “disequilibrium” or non-Walrasian microfoundations for macroeconomics that could displace the unrealistic and inappropriate assumption of perfectly competitive equilibrium.

#### MYTHS ABOUT THE SEARCH FOR MICROFOUNDATIONS

The story of the evolution of macroeconomics from the 1950s to the 1990s has been told many times, but usually by practitioners reflecting on their subject in textbooks (e.g., Blanchard 2003) or through public reflections on the progress that the field has made (e.g., Mankiw 1990; Woodford 1999; Blanchard 2000) or in claims that the field has gone wrong (e.g., Solow 1997; Krugman 2009).<sup>1</sup> The problem with most of this literature, we argue,

<sup>1</sup> An important exception is Hoover (2012), who traces the search for microfoundations back to Keynes, arguing that before the 1970s great importance was attached to the heterogeneity of agents. Extended discussions can also be found in *The New Palgrave Dictionary of Economics*, the first edition of which covered the topic in three articles: “Macroeconomics: Relation with Microeconomics” (Howitt 1987) and “Disequilibrium Analysis” (Bénassy 1987a) and “Rationed Equilibria” (Bénassy 1987b). In the second edition, these were replaced with an article on “Microfoundations” (Janssen 2008), “Dynamic Models with Non-Clearing Markets” (Bénassy 2008a), and “Non-Clearing Markets in General Equilibrium” (Bénassy 2008b). Bénassy (1995, 2006) has also edited and discussed two substantial collections of articles on the topic. Other significant surveys discussions include Silvestre (1992), Janssen (1993), and Busetto (1995). Weintraub (2008) provides a skeptical note about the (ir)relevance of modern developments for the microfoundations debate. His earlier work on the search for microfoundations (E. R. Weintraub 1977, 1979)

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is that, with very few exceptions, it either misses important developments in macroeconomics that were increasingly spurned in and after the 1970s or does not see their full significance. Like most intellectual historians, we are interested in blind alleys and ideas that proved mistaken as much as in ideas that were ultimately successful. However, the story is intriguing because, as we show, many of these abandoned theories were aimed at addressing problems for which the successful theories had no solution.

An example of failure even to mention the search for disequilibrium microfoundations is the account provided by Michael Woodford (1999), whose textbook became very influential after the millennium. The starting point in his account is the Keynesian revolution, the contribution of which he argues was to shift attention from the business cycle to statics to the simultaneous determination of prices, the rate of interest, output, and employment. Although it involved neglecting important problems, it focused attention on problems that had to be solved if the field was to make progress. Initially, there was a methodological gulf between Keynesian macroeconomics and classical microeconomics, but this was, he claimed, bridged by viewing macroeconomics through the lens of general equilibrium theory. The resulting neoclassical synthesis involved the “redefinition of the scope of Keynesian analysis as relating purely to the period before wages and prices were able to adjust” (Woodford 1999:10). Despite this achievement, “the perceived incompleteness of the theoretical foundations of Keynesian economics continued to motivate important work of criticism and refinement” (Woodford 1999:11), notably analyzing components of the Keynesian model such as the consumption function and the demand for liquid assets in terms of individual optimizing behavior.

The challenge to the first neoclassical synthesis, Woodford argues, came with “the great inflation,” which caused a crisis in Keynesian economics. The need for analysis of the relationship between policy and inflation,

is discussed in Chapter 8. Solow (2004) provides an example of the clear recognition by a leading macroeconomic theorist of the notion that macroeconomic models have always had microfoundations, even if less formal microfoundations than those found in the modern literature. There have been some other accounts of the search for microfoundations (e.g., Van Ees and Garretsen 1990; Garretsen 1992; Janssen 1993; Kirman 1993; Rizvi 1994; Hartley 1997; Gallegati and Kirman 1999; De Antoni 2006; De Vroey 2006; and Arena 2010). However, while they have made some valuable points (e.g., Van Ees and Garretsen have pointed out that the concerns of the disequilibrium macro were far more ambitious than merely explaining wage stickiness), their concerns are substantially different from ours. Janssen’s concerns are methodological, while Garretsen is concerned with developing an interpretation of Keynes. Rizvi, though providing a discussion that covers many of the works that we discuss, focuses on evaluating general equilibrium theory. De Vroey (2006) and Arena (2010) are focused on material outside the story on which we focus.

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which Keynesian economics, being essentially static, could not provide, led to a reassessment and the rise of new theories.

Most notably a framework was needed that would clarify the links between macroeconomic policy and the eventual changes in the general price level that would result from it. Attention to this problem soon pointed up other weaknesses of Keynesian models, such as their neglect of the endogeneity of expectations and of the determinants of supply costs. Together with the lingering conceptual problem of the relationship between macroeconomic and microeconomic theory, these issues provided fuel for a series of fundamental critiques of Keynesian economics, that have often been described as “revolutions” or “counter-revolutions” in their own right. (Woodford 1999:14)

From here, Woodford discusses “monetarism,” “rational expectations and the new classical macroeconomics,” and “real business cycle theory,” noting that it proved “possible to incorporate rational expectations – and indeed, intertemporal optimizing behavior – into models of nominal wage and price rigidity” to obtain “new Keynesian models” (1999:24). By the 1990s, this variety of approaches, distinguished by attitudes to wage and price flexibility and by methodological differences, set the scene for what he labels, with a modest question mark, the new neoclassical synthesis. Like the synthesis represented by Patinkin, this approach uses the tools of general equilibrium theory to bridge the divide between macro and micro, but it does so using dynamic models.

Today this [using general equilibrium theory] means using intertemporal general equilibrium analysis to model the complete dynamics of the macroeconomy – just as is done in modern theories of financial markets, industry structure and so on – rather than simply using a static general-equilibrium model to describe the long-run position toward which the economy should tend asymptotically. In practice this means that the methodology of the new synthesis is largely that of the real business cycle literature, even though wage and price rigidities are allowed for, and the determinants of (individually) optimal wage and price-setting decisions are modeled in detail. (Woodford 1999:29)

Although based on real business cycle methodology, which in turn drew on the new classical macroeconomics, Woodford’s was a synthesis in the sense that it finds a role for both Keynesian and classical ideas. The two views are relevant in different situations. He disparaged the idea of describing the synthesis as Keynesian on the grounds that such nomenclature was not appropriate in science: one does not, for example, have “Einsteinian physicists.”

A number of features of Woodford’s account need to be challenged. The first is that he is concerned with policy: it is the policy challenges that drew

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attention to the problems in Keynesian economics and hence prompted the need for re-evaluation of macroeconomic theory. There is no suggestion that a reappraisal of Keynesian economics was well under way before the new policy challenges arose; neither is there any suggestion that these challenges had to do with the general equilibrium framework itself. Second, Keynesian phenomena are equated with wage and price inflexibility, without suggesting that this explanation might have been one of the major issues under debate.

Woodford is not the only author to have removed disequilibrium theory from the history of macroeconomics. In his macroeconomics textbook, Blanchard (2003:572–81), is silent, jumping straight from “the neoclassical synthesis” to “the rational expectations critique” and “modern developments.” Even a distinguished historian of economic thought, Mark Blaug (1992, ch. 12), offers a methodological interpretation of the history of macroeconomics between the 1960s and 1980s as a debate between Keynesians and monetarists in which disequilibrium macroeconomics is barely mentioned. By the late 1980s and early 1990s, most surveys of competing schools of macroeconomic thought either omitted disequilibrium macro altogether (e.g., Phelps 1990), or treated it as a finished episode (e.g. Snowdon, Vane, and Wynarczyk 1994:109–23), which, by forcefully bringing into the picture the issue of the microfoundations of macroeconomics, led both to the revival of interest in the market-clearing approach (New Classical school) and to attempts to rationalize wage and price stickiness (New Keynesian economics). The latter may be correct, but, as we hope to show, it is a limited view.

A clue that something significant is missing from the argument is that many of the names that dominated the period’s macroeconomic literature are either absent from Woodford’s account, or play minor roles: Robert Clower, Axel Leijonhufvud, Robert Solow, Robert Barro, Herschel Grossman, Frank Hahn, Jacques Drèze, Jean-Pascal Bénassy and Edmond Malinvaud. Not only is what was, in 1988, almost twenty years after its publication, the most-cited article in the *American Economic Review*, “A General Disequilibrium Model of Income and Employment” (Barro and Grossman 1971; see Anonymous 1988) not mentioned, but the entire literature to which it was a contribution is passed over. Barro and Grossman’s article was cited 325 times, and in addition, their subsequent book (1976) was cited 285 times. Citation counts do not prove that an article is important, but they sound a warning.

Figure 1.1 shows that there was a sizeable literature on disequilibrium analysis and that it began before the dramatic events of 1973. In the words of Peter Howitt (1990:10), “for a brief period in the early 1970s,” disequilibrium

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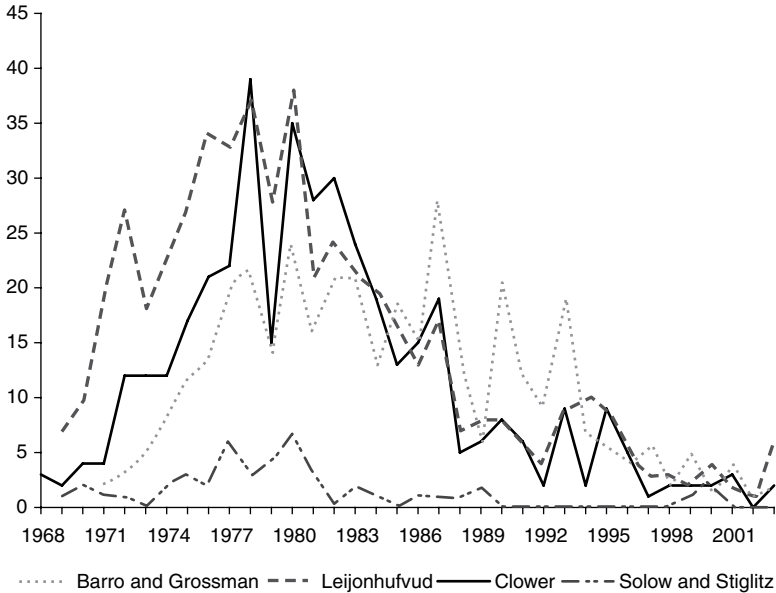
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Figure 1.1. Citation counts for Clower (1965), Leijonhufvud (1968), and Barro and Grossman (1971)

macro was “the hottest topic in macroeconomics”. It also shows that interest in these works continued well into the 1990s.

Not all histories ignore disequilibrium macroeconomics as completely as does Woodford’s. However, where the topic is discussed, it is almost invariably as the prelude to the New Keynesian macroeconomics (see, e.g., Mankiw 1990:1655–56; Blaug 1997:672–73, 685–87; Blanchard 2000:1386–87). Disequilibrium macroeconomics is presented as the economics of price rigidity. Economists realized, so the New Keynesian stories run, that conventional theories, based on perfect price flexibility, could not provide an adequate explanation of Keynesian unemployment, and so economists explored the implications of wages and prices being sticky: the result of price stickiness was that markets do not clear, creating spillover effects in other markets. Disequilibrium could imply a demand multiplier under conditions of Keynesian excess supply in both goods and labor markets, or a supply multiplier with generalized excess demand in those markets, depending on the price vector. Such results were “tantalizing” in the macroeconomics of the 1970s (Blanchard 2000:1386). However, there was the problem of which scenario was more likely, which could only be settled by a theory of price formation.

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As suggested by Gregory Mankiw (1990:1655), general disequilibrium models “à la Barro-Grossman do not fit easily into the history of post 1970 macroeconomics. In contrast with most of macroeconomic theories put forward after that, they were not directly aimed at correcting the flaws that provoked the breakdown of the consensus that prevailed until the early 1970s.” More recently, Mankiw (2001:C49n1) has claimed that New Keynesian theories started in the mid 1980s should be interpreted as “explaining why the [excess supply] regime in general disequilibrium models is the normal case.” In the same vein, Huw Dixon (1997:176–79) has argued that the essential insights of disequilibrium macroeconomics about firm rationing in the output market are based on the notion that price exceeds marginal cost, as later developed in the imperfect competition New Keynesian models. New Keynesian economics then enters as a natural development from this, in that it provides explanations of why prices are sticky and does not simply assume it. As in Woodford’s account, the story remains a tale of clear progress.<sup>2</sup> Both versions of what happened to macroeconomics around 1970 – be it Woodford’s writing the search for disequilibrium microfoundations out of the story or presenting disequilibrium macroeconomics as no more than a primitive forerunner of New Keynesian Economics (of which both Mankiw and Dixon are supporters) – miss important elements of the history and hence distort it.

#### REVISING THE HISTORY

Our claim is that if we are to understand the way macroeconomics developed during this period, it is essential to have a much fuller account of the search for disequilibrium microfoundations. The New Keynesian theories capture part of what went on but they nonetheless leave important parts of the story out. The first point is that, as we have already mentioned, disequilibrium theory began before the crisis of the 1970s: the search for a new macroeconomics was not just a response to economic events. It involved many of the leading figures in the discipline, and, crucially, it was an attempt to find an alternative to a theory of general competitive equilibrium believed to be both unrealistic and logically flawed. The second point is that though fixed-price models were important, the literature went well beyond that. Models with price rigidities were used as a first step in the analysis because it was believed that they were a better approximation to

<sup>2</sup> Backhouse (1995, part III) presented one account in this vein. This book can be seen either as a criticism or as a development from that.

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the way real-world markets behaved than were models of market-clearing competitive equilibrium. Where we part company with the new Keynesian accounts cited earlier is that the literature went further than this in important respects:

- (1) Price rigidity was believed to arise because disequilibrium was the inevitable result of adjustments to equilibrium having to take place in real time: it did not arise simply because of institutional market imperfections such as unions or barriers to entry. When market conditions change, prices need to change and, outside organized, centralized markets (such as stock exchanges or commodity markets), this process takes time with the result that some trades take place at disequilibrium prices. Non-Walrasian theories were thus intended as general theories about how markets worked.
- (2) For a significant number of contributors to the literature, the theory was needed because the theory of general competitive equilibrium was logically deficient in that the model contained that no one who could change prices. The story was sometimes told of an “auctioneer” who would cry out prices, with no trading taking place till an equilibrium set of prices had been worked out—the so-called *tâtonnement* process—but this was clearly a fictitious person who was not part of the model. However, though some markets operate like this, most markets do not. More important, if there were such an individual (or agency), it would involve costs, which immediately invalidates the assumption that trading can take place costlessly.
- (3) The literature, contrary to the claims of those who see only fixed-price models, did extend to theories in which prices were endogenous. Models were developed in which agents had the power to set prices. Obviously, this meant that the models were, in a sense, models of imperfect competition. However, as explained in point (1), imperfect competition did not arise because of institutional barriers to competition: it arose simply because, in the absence of a *deus ex machina*, agents had to be the ones who set prices, and if so, they had to have the power to do so, if only whenever prices are out of equilibrium.

#### A NOTE ON TERMINOLOGY

Discussion of this literature is beset with terminological problems, and different labels abound: non-Walrasian theory, disequilibrium theory, equilibrium with rationing, non-*tâtonnement* theory, fixed-price



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models. Before proceeding, it is important to clarify the way these terms are generally used.

One of the earliest terms was “disequilibrium macroeconomics,” following the title of Barro and Grossman’s article (1971) “A General Disequilibrium Model of Income and Employment.” Equilibrium meant simply market clearing – equality of supply and demand in each market – and “disequilibrium” that this was not so, arising because agents (both households and firms) faced not only a budget constraint but also constraints on what they could buy or sell.

However, the term *equilibrium* can also mean, following its physical meaning as a state of rest or a balance of forces, the solution to a model. In traditional theory, these two meanings were the same, for the only forces were demand and supply understood as the amounts that agents wanted to buy and sell at the prices they faced. In models with rationing, on the other hand, agents were assumed to face constraints that forced them off conventionally defined supply and demand schedules, so the two meanings of disequilibrium diverged. It was possible to have equilibrium (in the sense of a balance of forces) in which there was disequilibrium (in the sense that supply and demand are unequal in one or more markets). This was the essence of disequilibrium models, for the claim was that markets would not converge to a position where all markets cleared.

This terminological problem becomes particularly obvious in the case of general equilibrium models. When Barro and Grossman wrote of a “general” disequilibrium model they meant one in which there could be disequilibrium in any or all markets, not simply, as in much of the literature, just the labor market. Theirs was, however, a macroeconomic model in that it dealt with aggregates: there were markets for labor and commodities.<sup>3</sup> However, the term “general equilibrium theory” had come to mean a particular type of model – microeconomic in that it modeled an arbitrary number of potentially heterogeneous agents, but general in that it modeled all markets simultaneously and that very general assumptions were made about consumers’ preferences and about technology. Moreover, general equilibrium analysis focused on proving that equilibrium existed and investigating whether it was unique and stable. The result was that when price rigidities and imperfect competition were analyzed within this framework, producing models in which markets did not clear – disequilibrium models according to one meaning of the term – they were still called

<sup>3</sup> There is a need for a third market in the background, but this does not need to be modeled explicitly.

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general equilibrium models, because of the genre of which they clearly formed a part.

Equilibrium can also mean that agents face situations in which, given the constraints they encounter (which of course include market conditions) they have no reason to change their behavior – that consumers are maximizing utility and firms are maximizing profit. In the traditional general equilibrium model, in which supply and demand schedules described behavior, equilibrium in this sense implied market clearing. However, once we depart from that framework, problems arise. If competition is imperfect, or monopolistic, individual agents have some market power in that they can change the prices at which they trade. Equilibrium, in the sense of a situation where maximizing agents will not wish to change their behavior, will not imply market clearing, for it will not be profitable for sellers to lower their prices to the market clearing level. Similarly, if agents have mistaken expectations or asymmetric information, or are bound by long-term or even implicit contracts, they may choose to remain in situations in which markets do not clear.

A widespread feature of this literature is rationing, the term “equilibrium with rationing” being common. It is particularly important in the general equilibrium literature for, if agents are not identical, the rationing scheme may matter. For example, when there is a shortage of goods, is everyone forced to consume less, or do some people get all they want and others nothing (as when some people are fully employed and others have no work)? Or, if there is a shortage of goods, are they allocated by first-come first-served, queuing, a lottery, or some other mechanism? Rationing raises further questions. Does rationing imply that agents are not maximizing utility or profit? One answer is that they are maximizing subject to a constraint on the quantity that they can buy or sell. However, this raises the question as to why they do not offer higher prices to obtain goods that are in short supply, or offer to reduce prices to sell goods or labor for which there is insufficient demand. Surely, some economists argue, rationing caused simply by the fact that prices have not adjusted to equilibrium must imply non-maximizing behavior.

Rationing also raises a question about competition. Perfect competition refers to a market in which agents are price takers – they cannot change price – and they can buy or sell as much as they wish at the prevailing prices. Rationing violates that assumption, which implies that competition cannot be perfect if there is rationing. Equilibrium with rationing thus becomes equilibrium with imperfect competition. Thus, if out-of-equilibrium transactions are seen as an inevitable consequence of economic activity taking