

Beyond New Keynesian Economics: Towards a Post Walrasian Macroeconomics*

David Colander, Middlebury College¹

In the early 1990s in a two-volume edited book (Mankiw and Romer 1990) and in two survey articles (Gordon 1991, Mankiw 1990), the economics profession has seen the popularization of a new school of Keynesian macroeconomics. Now it's becoming commonplace to say that there's New Keynesian economics, to go along with post Keynesian economics (no hyphen), post-Keynesians economics (with hyphen), neoKeynesian economics (sometimes with a hyphen, sometimes not), and, of course, just plain Keynesian economics.

While the development of a New Keynesian terminology was inevitable after the New Classical terminology came into being--for every Classical variation there exists a Keynesian counterpart--it is not so clear that the new classification system adds much to our understanding. There are now so many dimensions of Keynesian and Classical thought that the nomenclature is becoming more confusing than helpful. Most economists I talk to, even Greg Mankiw who edited the book that popularized the term, are tired of the infinite variations on the Keynesian/Classical theme.² I agree. But the fact that the Keynesian/Classical variations have played out does not resolve the problem of how one explains to non-specialists the variations in approaches to macro that exist.

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²In private correspondence to me Mankiw writes:

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Requirements for Using New Terminology

As an historian of recent economic thought and as a textbook author, I look upon nomenclature issues as issues of serious concern. I see my job as trying to make sense of what economists are doing, putting their work into perspective, and providing a summary of high level work that students and other economists who do not specialize in the field will find helpful. The development of new classifications is a natural way to achieve these goals.

Any classification scheme that will be helpful to students and non-specialists requires significant simplification and squeezing of ideas into cubbyholes into which they do not quite fit. So I am sympathetic to the problems of classifying schools of thought, and recognize that any classification system will be less than perfect. It was in attempting to simplify some recent developments in macro thinking for students that I first started to use the term, New Keynesian.³

In considering the development of any terminology it is helpful to start with the question: What set of characteristics should a body of thought have to warrant its own name? In my work I have developed the following criteria: (1) The use of the name should help organize thinking about the issues to which it refers and it should do so in a way that is understandable to the non-specialist. (2) It should seem natural and intuitive to most practitioners and acceptable to those thus classified.⁴ If the name doesn't meet these two criteria it will simply clutter the terminological landscape; if it does, then the name can serve a useful purpose: it can complete a picture, and make not only the new work clear,

³ Michael Parkin, I, and perhaps others, started using the term, New Keynesian, in the mid 1980s to describe the Keynesian response to New Classicals. I started using the term (Colander 1986, Koford and Colander 1985) to classify the work of those economists who were trying to provide a n answer to New Classicals.

⁴I am thankful to Michael Parkin for suggesting this second criterion.

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but, like the final piece of a puzzle, also make the previous work clearer. Otherwise the classification will confuse, not clarify. Just as a piece of a puzzle in the wrong place will obscure a picture rather than complete it, so, too, will a loosely-used term.

The Problem with the New Keynesian Terminology

It is because it does not meet the above criteria that people are disparaging of the New Keynesian terminology. Using the above criteria, if the term New Keynesian is to be helpful, it must be easily distinguishable from other classifications of Keynesianism and from Classical thought. Since these other classifications are vague, this is a difficult goal to meet. The standard use of the term, New Keynesian, which is based in large part on Mankiw and Romer's definition, does not meet this goal.

To see the problems the vagueness creates consider Mankiw and Romer's definition. They define New Keynesian economics in relation to two questions about a macroeconomic theory:

1. Does the theory violate the classical dichotomy?
2. Does the theory assume that real market imperfections in the economy are crucial for understanding economic fluctuations? (Mankiw and Romer 1990, Vol. 1, p. 2.)

They respond to these questions by writing: "Among the prominent approaches to macroeconomics, New Keynesian economics is alone in answering both questions in the affirmative." (Vol. 1, p. 2.) This response is problematic. All Keynesians would answer both those questions affirmatively and thus would be classified as New Keynesians by Mankiw and Romer.

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Later in their discussion Mankiw and Romer accept that "many older macroeconomic theories rejected the classical dichotomy," so it seems that it is the second part of the definition that Mankiw and Romer believe separates New Keynesians from other types of Keynesians. But that second part is not defining; what Keynesian would argue, if he or she is judging markets relative to a unique equilibrium Walrasian system, that he or she is not assuming real market imperfections, and that those market imperfections are not crucial to understanding economic fluctuations. The distinguishing characteristics among subgroups of Keynesians are not in whether market imperfections are crucial; the distinguishing characteristics are in how those imperfections enter in and what they are.

Mankiw and Romer provide little support for their definition; in the one line of justification they do give to the second characteristic they concede that "[Keynesians] usually *did not emphasize* real imperfections as a key part of the story. For example, most of the Keynesian economists of the 1970s imposed wage and price rigidities on otherwise Walrasian economics."

Gordon (1990) gives a good, clear perspective and overview of the work Mankiw and Romer call New Keynesian. But he does not ask the terminological question: Does this set of work deserve to be called by a separate name? He essentially accepts the use of the Mankiw and Romer terminology. Gordon's short discussion of the definition of the term, New Keynesian, states that it is "research within the Keynesian tradition that attempts to build the microeconomic foundations of wage and price stickiness." Since work on microfoundations has been ongoing since the late 1960s, particularly with the Phelps volume (1969), this places the origins of New Keynesian economics prior to New Classical economics. But that is not the case; as Gordon states immediately following that quotation,

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and as he reiterates in a footnote, New Keynesian work is a reaction to New Classical work.⁵

Gordon's excellent survey of the literature that Mankiw and Romer call New Keynesian is critical of much of it. For example, he writes, "Much existing new-Keynesian theorizing is riddled with inconsistencies as a result of its neglect of constraints and spillovers." (1138) His critical discussion of how that work fits together calls Mankiw's and Romer's use of the term into question; work that is inconsistent, and that is incompatible with other work, should not be classified under the same name as the work with which it is said to be inconsistent and incompatible.

In summary the problem with the term, New Keynesian, is that it includes a wide variety of disparate work under the term, "New Keynesian" and provides little insight about what is revolutionary about the work.

Classifying the Different Components of New Keynesian Literature

Despite the problems with the terminology most people use the New Keynesian classification because they find much original work in the papers which Mankiw and Romer classify as New Keynesian. The problem is not its originality; it is its disparity. The work includes within it subgroups of work so broad and disparate as to require at least three different classifications, one of which is not even Keynesian.

Stiglitzian Economics

For example, the partial equilibrium work of Stiglitz (Stiglitz and Weiss 1981), and Akerlof (1970), and others on the informational content of prices is definitely new and

⁵Gordon states that "the adjective, "New Keynesian," nicely juxtaposes this body of research with its arch-opposite, the new-classical approach." (P. 1115.)

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exciting work. In it prices have multiple functions; besides equating supply and demand, they also provide information to individuals. This information role of prices means that they do not necessarily equate supply and demand, at least in the traditional sense. For example, say an unemployed worker offers to work for half the going wage. If firms interpret that offer as meaning he or she is a low quality worker, they may still not hire him or her. When that happens strategies change and there can be no presumption that the market equilibrates at a no involuntary unemployment equilibrium.

Stiglitz's work has much relevance to providing a microfoundation to Keynesianism far down the road, but this work's importance is far greater than that. Accepting the Stiglitz argument does no less than change one's conception of what is meant by a partial equilibrium supply-demand equilibrium; it deserves its own classification which conveys the breath of its import. New Keynesian is far too confining. It might be called Stiglitzian, Akerlofian, or even Akerlitzian (Stiglitzian?), but if the classification terminology is to be helpful, it should not be limited to a Keynesian macroeconomic term.

In this aspect of their work neither Stiglitz nor Akerlof claim to be writing in a Keynesian tradition; they are, instead, providing a theory about how equilibrium unemployment could come about in a single market. They are providing a partial equilibrium explanation of unemployment that is fundamentally different than the Keynesian attempt to provide a general theory of the aggregate economy that would lead to an under full employment equilibrium. In many ways Stiglitz's work fits much better in the Classical Pigovian tradition of unemployment that Keynes was providing an alternative to, than it does in a Keynesian tradition. Classifying Stiglitz's informational work as New Keynesian misleads people as to its origins and connections and does not help people understand the revolutionary aspect of that work. The same holds for Phelps' new macroeconomic synthesis in *Structural Slumps*. (1994) His equilibrium explanations for a

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moving steady state natural rate equilibrium is far more characteristic of Pigou's structural analysis than of Keynes' demand deficiency analysis.

New NeoKeynesian Economics

A second theme of the work that has been called New Keynesian does fall under the broad Keynesian label as that label has been used. This includes the work of Mankiw (1985) and others on costly price adjustment, the work of Fischer (1977) and Taylor (1979) and others on slow wage and price adjustment, and the work of Hall (1986), Hart (1982), and others on imperfect competition. This work is definitely in a neoKeynesian tradition, but it is not clear that it is a dramatic enough departure from earlier work to warrant the "new" prefix. Keynesian economists have long been worried about these issues of microfoundation of macro; they may not have modeled it quite as formally as these authors, but the themes have long been there.

One could argue that since the more recent work uses a different methodology than previous work, and structures the questions it poses slightly differently, and more systematically attempts to provide a microfoundation to the neoKeynesian IS/LM model, that it might warrant a sub classification of its own. If that is true, a far better classification would be New neoKeynesian to distinguish it from old neoKeynesian.

The reason it should be called New neoKeynesian, if it is to have a separate classification, is that it is traditional Keynesian work that provides a foundation for the neoKeynesian model; it is evolutionary within the neoKeynesian tradition, not revolutionary. Indeed, most of the authors of this work have the traditional neoKeynesian model in the back of their minds. Mankiw actually states as much; he writes, "this [New Keynesian] research can be viewed as attempting to put textbook Keynesian analysis on a

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firmer microeconomic foundation." (Mankiw 1990, 1648). Let me be clear: I am not advocating the term, new neoKeynesian; since I don't think the term New Keynesian meets an appropriate "new terminology criteria" I do not support subdivisions of that terminology. I point it only to show how difficult it is to meaningfully classify work while using this New Keynesian terminology.

Extra Market Coordination Problems

A third theme in the work that has been classified New Keynesian involves extra-market coordination failures, and spillover effects among markets. This work accepts the Keynesian notion that the competitive market will not necessarily lead to a Pareto Optimal result and explores why. In this work macroeconomic problem is analyzed as a strategic game theoretic problem with multiple solutions and dynamic spillovers from one market to another become the central focus of economic analysis. Work that fits in here that Mankiw includes at New Keynesian includes work by Cooper and John (1988) and John Bryant (1983).

It was to separate out this work from other work that I argued about the definition of New Keynesian economics. I tried to limit the term, New Keynesian, to this work. I had little success. One problem with my alternative definition which focused on extra market coordination failures was that some practitioners were not happy with it. Post Keynesians objected to a new term which I argued included them, but also included me, Robert Clower and Axel Leijonhufvud. Their objections were reasonable since Post-Keynesian work had prior claim to many of the views that I ascribed to New Keynesian work. If "new" included most of "post", how could it be new? A second problem was that this coordination failure economics had little to say in the way of policy, and the term Keynesian usually conjured up significant visions of policy.

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I did have some success and I am pleased to see that Paul Davidson (1994) notes that Michael Parkin, who was cited by Gordon as the originator of the term, has now agreed with me that if the term, New Keynesian, is to be used, it should be limited to this coordination work. Nonetheless, I hereby concede the definitional battle for New Keynesian economics. Mankiw's broad, almost meaningless, definition is what people have in their minds when they think of New Keynesian economics, and it is not going to change. Given this reality I have come to the conclusion that the term, Keynesian, has too much baggage with it to be useful in using it to classify any new work. It is more than fully subdivided. Thus, it is time to come up with a new division of approaches to macro.

An Alternative Classification Scheme for Distinguishing Approaches to Macroeconomic Theorizing

The new classification system of macro that I propose is between *Walrasian macro* in its various forms, and what I call *non Walrasian macro*. *Walrasian macro* includes all macro economic work that accepts the existence of a unique aggregate equilibrium toward which the aggregate economy is tending.⁶ Since most existing Classical and neoKeynesian work accepts the existence of a unique aggregate equilibrium this term includes much of what is currently called neoclassical economics, neo Keynesian economics and what I above called new neo-Keynesian economics.

⁶ Just as the term Keynesian can mean many things, so too can the term Walrasian. I am using it to mean the unique equilibrium system in which a auctioneer sets price and no trading is done at disequilibrium prices even though the system is always in disequilibrium. Donald Walker (1994) points out that while this view of Walras follows from the forth edition of the *Elements*, the version most English speaking economists are familiar with, since that was the version translated, in earlier versions there was a different, more meaningful system--one which is closer to what I am calling Post-Walrasian. Walker calls this earlier version the "mature Walras" and attributes the later version to Walras' intellectual decline that began in the mid 1890s. Thus, in some ways what I am calling Post Walrasian, and which elsewhere (Colander 1995) I associate with Marshall, could in some ways be called "mature Walrasian."

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Non Walrasian macroeconomics does not accept the existence of a unique equilibrium for the aggregate economy. It approaches macro from a fundamentally different perspective than does Walrasian macro, and analyzes it under the presumption that there are multiple equilibria. The existence of multiple equilibria makes an enormous difference for macroeconomic theorizing. Specifically, assuming equilibria is no longer the equivalent to assuming optimality. Moreover, the entire modeling strategy changes since simple calculus is no longer relevant. It leads on to an analysis of strategic complementarities in which there are multiple paths the aggregate economy can follow depending on which of a set of reasonable strategies individuals choose.

Notice that Non Walrasian macro overlaps with one part of New Keynesian macroeconomics--with the work that sees the requirement for extra market coordinating mechanisms. It is an enormously broad division and will be broken up in numerous ways as researchers follow different strategies in trying to come to grips with the problems of conceptualizing within this non-Walrasian framework. For example in my work, (Colander, 1996) I have tried to deal with the complexities by additional assumptions and have given this approach the name: Post Walrasian macro. The additional assumptions I propose are:

1. Not only does the economy exhibit multiple equilibrium; it also exhibits complex dynamics. An economy with complex dynamics cannot meaningfully be analyzed within a comparative state model that assumes the aggregate equilibria are unaffected by the dynamic adjustment process.
2. I further conjecture that the aggregate economy is so complex that general equilibrium rational decision making is impossible. I do not give up rationality I simply give up global rationality as being beyond the capabilities of individuals. For Post Walrasians rationality is bounded rationality.

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3. The above two conjectures would likely mean that the economy would exhibit chaotic results. What prevents those chaotic results is a third conjecture--that the reason the aggregate economy is relatively stable is the existence of multi-layered institutions--conventions, legal and social, that impose restrictions in individual actions--which limit individual actions within ranges. These institutions impose the stability that exists in the system and reduce the complexity of decision making for individuals. thus, institutions play a central role in Post Walrasian macroeconomics; one cannot analyze about an institutionless world. Markets coordinate individual actions within institutions; to understand that coordination, one must understand how the institutions work.

Exploring the implications of these three assumptions in a multiple equilibrium world is an enormous task, but, when done, will likely lead to a new view of the way the economy works that differs significantly from current mainstream approaches. It has much more connection with economists currently working out of the mainstream. For example, this Post Walrasian approach is a broad approach which I believe is big enough to include myself, Robert Clower, Axel Leijonhufvud, many, if not all post Keynesians, as well as many Marxists and Austrians.

The litmus test for whether work is Post Walrasian is its approach to the microeconomic foundations of macro. Walrasian macro is searching for some unique microfoundation to macro as an explanation for market failure. This allows it to move from an analysis a representative individual to the aggregate economy. From a Post Walrasian perspective, such a representative individual approach does not make sense. Post-Walrasian macro denies the existence of a non-contextual microfoundations and hence of a unique representative individual. It argues essentially that the macro economy is sufficiently complex and decisions sufficiently strategic that determining a rational approach to macro decisions that fits a Walrasian general equilibrium framework is impossible for the actors in the economy. Instead, "Post-Walrasian rational" individuals

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must make decisions within a macro context; they exhibit bounded rationality, not global rationality. and the aggregate economy must be modeled accordingly.

I would include a variety of disparate work within the Post Walrasian label. I would include the work of John Bryant (1983), Cooper and John (1988), Costas Azariadis (1981), Cass and Shell (1983), Leijonhufvud (1993), Koford and Colander (1985), Garretsen (1991), van Ees (1991), Farmer (1993) and Rosser (1991). Brian Arthur's, (1994) and the Santa Fe Institute's work also ties in closely with this approach.

Notice the enormous disparity of this work when considered along traditional Keynesian/Classical lines. Clower cringes when called a Keynesian; Davidson cringes if he is called anything but a Keynesian. Bryant is working in a New Classical tradition and is highly technical; Leijonhufvud is working in a historical Keynesian tradition. Cass and Shell and Farmer are highly technical general equilibrium theorists discussing why sunspot equilibria are likely; Van Ees and Garretson are working in a European Malinvaudesque Keynesian tradition, and who knows what tradition I am working in?

Despite these differences, from this diverse work comes a fundamentally different vision of the macroeconomic problem as compared to the Walrasian vision. The difference concerns the uniqueness of the equilibrium towards which the economy will gravitate, and the nature of the market's solution to the coordination problem. In a Walrasian tradition markets are assumed somehow to exist, and somehow to cause the economy to gravitate to a unique equilibrium. The Keynesian version of Walrasian macro allows for temporary deviations from that equilibrium solution of that combination of markets, while the Classical version sees the economy always on that equilibrium, but otherwise the Walrasian Classical and Keynesian approaches are the same.

The Post-Walrasian approach to macro does not take markets as given. Markets are built up by individuals as a method of coordinating individual's actions. Thus, markets

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involve institutions created by people, and the analysis of economic problems must include an analysis of the constraints those institutions impose on the individual decision makers.

The difference between Walrasian and Post Walrasian macro can be demonstrated in their alternative formal specification of the aggregate production functions. Walrasian work models the aggregate production function either implicitly or explicitly as stable and unique. By that I mean it assumes that the production function is relatively stable and that there is a specific amount of aggregate output forthcoming for every specific amount of capital and labor. Its canonical production function is

$$x = f(K, L)$$

Shifts in aggregate production due to coordination failures of non market variables are afterthoughts.

In Post Walrasian work, the aggregate production function must be modeled differently to allow direct consideration of alternative levels of output due to non-market coordination failures and multiple equilibria. The production function must allow the same amount of capital and labor to be associated with different levels of output. It must allow for shifts in aggregate output due to demand spillover effects, externalities, coordination failures, or whatever. One way to include such effects in the aggregate production function is to specify it as follows:

$$x = f(K, L, C)$$

where C stands for the degree of non-market coordination in the economy

Post Walrasian macroeconomics focuses on the analysis of the C variable. Coordination is a very general term, so let me give an example of what I mean. Say, people expect low demand--they produce little based on that expectation, and thus the expectation of low

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demand becomes self-fulfilling. Output decreases because people expected low output. In the Walrasian production function for that result to be formally explained, one must show the reason firms wanted to hire fewer workers- i.e. the real wage is too high. One is then led to search for an explanation of why the wage rate is held too high to explain a decrease in aggregate output.

Using the Post Walrasian production function, a decrease in aggregate output can have many explanations which have nothing to do with the real wage. For example, the decrease could be explained as an expectations coordination failure that the market does not resolve. In the Post Walrasian approach there is no presumption that some abstract market will lead to an ideal result; the market itself is endogenous, as are expectations, and broad array of activities. When there is poor coordination of expectations, factor productivity, and aggregate output, can fall even with no change in inputs or technology.

With multiple aggregate equilibria, depending on how the causes of unemployment interact with expectations and other coordinating variables, unemployment equilibria may be preferable to full employment equilibria. For example, maintaining full employment in the market economy would require a highly flexible wage and price level. That flexibility could cause other serious coordinating failures which would lower output so much that less, not more, output is forthcoming. Thus, in the Post Walrasian specification of the aggregate production function wage inflexibility could be a good thing, rather than a bad thing.

The coordination specification of the production function is broad, and many different interpretations are possible. It is simply a construct that allows for a broader range of argumentation than does the Walrasian production function. In the Post Walrasian approach one does not need to rely on microfoundations problems to explain undesirable

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aggregate results. What one needs is a macrofoundations for micro--and that macrofoundations determines the degree of coordination in the economy.

Is an Analytic Post Walrasian Model Possible?

The above broad conceptualizations are the easy part of the analysis. In many ways, those broad conceptualizations are too easy since the multiple equilibria framework can be consistent with just about any result. For Post Walrasian economics to be meaningful, it must say something more than "anything goes." Most economists, quite correctly, demand more than broad conceptualizations, and, to be honest, Post Walrasian economics has not delivered anything more as yet. This failure has led many economists, who accept that the problems of multiple equilibria exist, nonetheless to make a leap of faith: that assuming those problems away to make the macro model tractable will not do too great an injustice to their analysis. They will make this leap of faith based on tractability, not intuition.

People who work in the Post Walrasian tradition are not willing to make that leap of faith. But that does not mean that they accept the "anything goes" model. Instead they try to understand small aspects of the aggregate dynamic adjustment process, and see potential problems that can arise. They are willing to content themselves with a much smaller domain for theory in understanding the macro economy than are economists working in a Walrasian tradition.

Accepting the full complexity of the economy most likely means that no analytic solution to the macro question of how markets interact will be reachable. At best, what one can hope for from a theory that accepts the complexity of the aggregate economy is that it provide some insight into the directional implications of observed shocks—how the

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economy might deviate from the direction it might like to go. Compared to the broad goals of the Walrasian strands of macro, these Post Walrasian hopes for what one might get out of macro theory are limited; such reduced hopes are the costs of taking the complexities of the aggregate economy seriously.

The above work and vision of the economy which I have described as Post Walrasian is a vision that turns New Classical economics on its head. It sees Walrasian economics as a special, and not especially interesting, subclass of Post Walrasian economics, one which assumes a unique aggregate equilibrium and therefore eliminates the need for an explicit analysis of the macrofoundations of micro. Its general equilibrium foundations are in Marshall, not Walras.⁷ Post Walrasian economics does not assume a single equilibrium and hence has at its foundation a macrofoundation to micro to set the context for micro analysis. Precisely what that macrofoundation of micro will be has yet to be determined; the work is still in its infancy, but the recognition of the need for it ties the Post Walrasian work together. The focus of Post Walrasian policy analysis is not the choices made by people, given institutions; the focus of policy analysis is the choices presented to people by institutions, and a consideration of how changing institutions will change those choices, and thereby change the aggregate equilibrium.

Was Keynes a Post Walrasian?

I make no formal claims that Keynes was a Post Walrasian. Keynes said many things, and can be interpreted in different ways and I do not want to get into any debate about what Keynes really meant. I'd lose, and I don't care that I'd lose. What I do claim is that thinking of the Keynesian arguments within a Post Walrasian framework opens up new avenues of discussion between different views that the Walrasian approach closes off.

⁷For a discussion of the Marshallian general equilibrium approach, see Colander (1995)

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That is precisely why the Post Walrasian approach needs to be distinguished from the Walrasian approach.

Concluding Comment

Classification is fundamentally important. But it is primarily for students to learn about different approaches. As ideas change, as certain approaches pan out, and others do not, the nature of approaches changes, and when that happens, the classifications can become albatrosses around people's necks. Fights ensue about who is what, and whether one approach or another belongs in a certain classification. Researchers close their mind to alternative approaches simply because it does not fit their classification.

Just as I believe the economy is path dependent, so too do I believe that classifications are path dependent; they evolve over time, and the useful classifications used in one time period become the blinders of another. For a number of years now I have become convinced that the term "neoclassical" is no longer relevant. The interesting and dynamic mainstream economists that I talk to, and there are many of them, are working on issues that do not fit what non-mainstream economists mean when they say "neoclassical." Non-mainstream economists use the term, neo-classical, as a catch-all for what they don't like. That's the worst type use of a classification. I've also become disenchanted with any classification that has the term "Keynesian" in it, and, yes, that includes new, neo, Post, post, new-neo, and non. There's too much baggage associated with the terminology and debates become centered around the baggage rather than around the issues.

In my view there are many interesting issues which are totally under explored, and various groups are beginning to explore them. I'm tempted to say that we are entering the Post Classical era--an era in which the enormous restrictions on thinking that characterized the neo-classical era--have been removed, and there has been a collateral reduction in

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heterodox approaches. There are significant rents to be lost in that reduction, but there are, simultaneously, enormous gains to be made in our understanding of the economy.

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If there is a role for macro policy, that role is to internalize an externality which exists because of a missing market. Macroeconomics is the study of how alternative property right structures can lead to alternative equilibria, and how alternative institutional structures can substitute for missing property rights.

New Keynesians explore whether it is possible to change the institutional structure so that an alternative preferable equilibrium will be chosen by individuals. This question changes the nature of macro policy questions from questions of policy given an aggregate production function, to a question of institutional structure--of how the aggregate production function should be modified so as to lead rational individuals to choose a preferable equilibrium. This allows New Keynesian economists, like New Classical economists, to maintain an equilibrium framework.

Let me give an example of what I mean by the type of policy questions which the New Keynesian framework allows one to pose. Abba Lerner and I (1981) proposed an alternative set of property rights which established rights in prices; to raise ones nominal price an individual must buy the right from another who lowers their price by an offsetting amount. Thus, with this new institutional structure, the nominal price level would be set by the rules underlying these property rights. We argued that for every different price of raising price the aggregate economy would equilibrate at an alternative equilibrium and that society must choose one of those equilibria. The typical economists' response to our proposal based on the conception of an unchanging production function was that the proposal would make society worse off because it would have transactions and implementation costs. This followed since the typical economists' model of an unchanging

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production function did not allow any benefits following from the proposal. Lerner's and my proposal may, or may not, be worth implementing, but a response that simply assumes away any possible benefits of the proposal is not especially helpful. New Keynesian economics allows such questions to be discussed.

The P variable in the coordination function concerns a second type of coordination failure that might occur. Not only can coordination problems exist in expectations and interrelationships of output and expenditure decisions; they can also exist in setting nominal prices and coordinating those decisions to reflect the desired relative prices. Thus, New Keynesian models also provide a new way to view the role of incomes policies. Incomes policies are a way to change the nature of the coordination, and thus they can make the economy more efficient. (See Colander, 1992.)

which may or may not be optimal. Society assigns economists the task of studying that institutional structure and determining whether there might be alternative institutional structures that lead to a preferable equilibrium. Thus, macroeconomists are the societal engineers assigned to study the aggregate production function and see if they can change it, thereby making society operate more efficiently.

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There are a number of reasons why a historically given market institutional structure might not lead to the preferable equilibrium. One is the thin market externality (Diamond 1982); another is the existence of interdependent rational expectations which leads to sunspot equilibria (Cass and Shell 1983); a third is the interdependent effort externality (Cooper and John 1988); a fourth is the monetary unit of account constraint—the need to have a non-accelerating price level to maintain the usefulness of the unit of account—that the use of money imposes on the aggregate economy (Colander 1992a).

Each of these reasons can be identified with a macro externality, and, hence, can be avoided by some set of property rights that internalizes that externality to the individual decision makers. (See Colander 1979, 1981; Lerner and Colander 1982; Colander and Koford 1985). Whether establishing changes in property rights is worthwhile is debatable since establishing new property rights has significant decision and transactions costs; the decision must be based on the costs and benefits of the policy, and how the change in property rights changes the equilibrium. Those are the issues at debate.

The New Keynesian vs .the NeoKeynesian Production Function

A good way to see the basic idea in New Keynesian economics is to compare a textbook version of New Keynesian aggregate production function with a textbook version of Classical and neoKeynesian aggregate production function.

NeoKeynesians, Classicals, and New Classicals all model the short- run aggregate production function as if it can be derived from individual behavior *without taking into account the interrelationships among individual decision makers*. By implicit assumption they assume that production decisions are made independently of demand decisions and

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that a specific level of output, Q_i , will be associated with one combination of outputs. This allows them to specify the production function in the following manner:

$$Q = f(K,L)$$

Having made that assumption they then ask the question: How will the market reconcile these independently-made decisions? Classicals assume price flexibility in the market; neoKeynesians assume some type of market imperfections, but both assume the production function specified above. With multiple equilibria that specification is unacceptable. The same level of inputs can be associated with various levels of output.

The New Keynesian production function does not fit that specification. Since New Keynesian economics sees individual decision making as interdependent, the production function must include some specification (some fudge factor like a quark in physics) that allows multiple equilibria. In Colander (1986) I called that specification C, for coordination. Following that approach the textbook New Keynesian production function is:

$$Q = f(K,L; C)$$

Given this production function two economies (or an economy at two different points in time) with identical amounts of capital and labor but with different amounts of coordination, can have different levels of output.⁸ This coordination factor of production

⁸A recent dramatic real-world example of the significant shift in output occurring is the experience of the formerly socialist countries where output fell thirty or forty percent with little change in

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accounts for the multiple aggregate equilibria or the non-optimal aggregate equilibrium which are a feature of all high level New Keynesian models.

The introduction of this coordination factor makes it possible that output in the economy could fluctuate enormously. It makes it possible that the aggregate market clearing equilibrium depends on people's expectations or other non-market dimensions. In the New Keynesian vision of the aggregate economy individuals interact not only in the market dimension, but also in an expectational dimension. Market failures can occur in either dimension; the New Keynesian work focuses on failures in the expectational dimension; the neoKeynesian work focuses on failures in the market dimension.

An example of the intuition behind the New Keynesian approach is the following: because of this expectational externality, if the representative individual expects low demand, he or she produces little and finds that this choice is right; the economy moves to a low production equilibrium. If people expect high demand, they produce a lot and the economy moves to a high production equilibrium. Thus depending on how expectations are coordinated, an economy with the same amount of capital and labor can produce different levels of output. The New Keynesian supply curve which reflects that New Keynesian production function shifts around in response to non market coordinating institutions. The neoKeynesian supply curve is constant unless there are technological changes.

Given this specification of the aggregate production function, New Keynesian models need not explain deviations from the desired equilibrium; such deviations are inherent in their specification of the production function. New Keynesian models must explain the opposite: why output in the economy fluctuates as little as it does.

unemployment as the admittedly bad coordination imposed by the central planners was eliminated or modified.

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The New Keynesian Research Agenda

The research agenda of New Keynesian economics is to meaningfully specify the coordination factor and explain its relationship to output, unemployment, and inflation. Among other things, it is dependent on the trading institutions in the economy which necessarily include money, the nature of markets, and the degree to which government works to coordinate individuals' decisions. Thus, a more complete specification of the New Keynesian production function would be something like the following:

$$Q = f(K, L, C(M, F)).$$

where C=coordination of expectations

M= monetary policy regime

F= fiscal policy regime

Since coordination, and hence production, is dependent on the monetary and fiscal regime, there is no need to explain how the stabilization role of government comes about. A role for government policy is not deduced from hypothesizing about prices that are imperfectly flexible; it follows from first principles.

With their alternative specification of the aggregate specification function, New Keynesian models maintain a potential role for monetary and fiscal policy even with rational expectations because they provide an alternative path through which monetary policy and fiscal policy affect the real economy: monetary and fiscal policy affect

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aggregate demand and thereby affect aggregate supply, which further affects aggregate demand and so on. Thus, New Keynesian models bring the multiplier process into the analysis, not in a mechanical way, but in a psychological expectational way. The multiplier process is individually rational, but collectively irrational.

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The justification for needing a macrofoundation for micro is analytic work that shows that multiple aggregate equilibria are a likely outcome of market interactions, and that a unique aggregate equilibrium will be forthcoming only if one makes strong ad hoc assumptions. Without making these ad hoc assumptions, there is no reason to assume that the economy will not move from one aggregate equilibrium to another. Without a single equilibrium, no unique rational expectation exists, and the aggregate economy can be subject to expectational bubbles and fluctuations as it moves from one equilibrium to another.

In Post Walrasian economic institutions are not imposed as they are not a Barro Grossman fixed price model or a Malinvaud approach. In these Walrasian Keynesian approach the little green flex price Walrasian auctioneer is replaced by the little red fixed price slow acting Walrasian auctioneer. In the Post Walrasian general equilibrium approach the auctioneer does not exist, but is instead in us and our institutions; market structure--the institutions which form our market--is endogenous.. We can only understand the workings of the markets by understanding those institutions.

The work I classify as Post Walrasian builds on these insights about multiple aggregate equilibria, and hence differs significantly from the new neoKeynesian work. Instead of trying to provide a microfoundation of macro within a single equilibrium Walrasian framework, this work places the macroeconomic problem within an aggregate multiple equilibria framework. In that framework even with rational expectations and full flexibility of prices, an economy can experience general equilibrium coordination failures.

The above insight means that, ironically, neither real and nominal wage and price rigidities, nor a dichotomy between the real and nominal sector, plays much of a direct role in distinguishing the two types of macro. It concerns the nature of the equilibria the economy reaches. Post Walrasian work can see the economy as potentially flitting from

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one equilibrium to another; in Walrasian work there is only one equilibrium, so if one wants to consider deviations from the optimum, one is forced to assume disequilibrium.

The Central Issue of Post Walrasian Macroeconomics

The standard neoKeynesian model makes what might be called the *independence assumption*: *The aggregate economy can be analyzed by analyzing the individual's decision independent of the interaction with the whole.* This assumption allows one to specify a representative agent and talk about the economy as if it were made up of many of these agents acting independently of their interaction with the whole.

One of the manifestations of this assumption is that one can specify the aggregate supply and demand functions as independent, not interdependent, functions, and assume that studying the issue of price flexibility within an implicit backdrop of perfectly competitive markets will provide insight into questions about coordination problems between aggregate supply and demand. Most of the work Mankiw and Romer describe implicitly makes that independence assumption, and hence it falls into the Walrasian category. *The distinguishing feature of Post Walrasian economics, as I define it, is that it does not accept that independence assumption*; it sees the coordination problem as more deeply embedded in the institutional structure of markets than the neoKeynesian model allows.

Coordination failures are possible in many dimensions and thus there are many strains of Post Walrasian macro. For example, expectations can be interdependent, and hence the expectation that one person holds can affect the decision of another; so too can effort of individuals and production decisions of firms be interdependent. A rational individual would make such interdependent decisions contingent on his or her belief of

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others people's beliefs. To adequately specify a model which includes such interdependent expectations, one must fully specify the contingent beliefs of individuals.

When coordination failures exist, one cannot analyze an interdependent economy via a representative agent considered independently of the whole if there exist any macroexternalities (effects of individual decisions which the existing institutional structure does not adequately coordinate). Thus, another way of describing Post Walrasian macro models is that they are models that focus on macroexternalities.

Macroexternalities can have two effects: they can lead to a single general equilibrium which is less desirable than some other equilibrium, or they can be an externality which gives the model multiple aggregate equilibria with no way for individuals to choose which of these equilibria the economy will gravitate toward. Shocks can push the economy from one equilibrium to another.

Potential Justifications for the Independence Assumption

The interdependence of individual choices is a priori obvious, but assuming interdependent choices makes one's models extraordinarily messy. Interdependent choice models violate Occam's Razor with a vengeance. Thus, if the independence assumption can be justified, it would be a highly desirable assumption to use.

There are two justifications that one could give. First, theoretically, multiple equilibria can be ranked, and it can be assumed that society chooses the preferable equilibrium; if an argument can be made that society chooses among equilibria, that argument can be used to reduce any multiple equilibrium model to a single equilibrium model. (This is of course a variant of the \$20 bill on the pavement argument, and is the implicit justification that New Classicals use for assuming a single equilibrium.) If there

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were no societal decision costs and transactions costs, this argument would make sense. It is reasonable to assume that the people in an economy with no transactions and decision costs would establish property rights in every interdependent action and thereby eliminate all macro externalities. But, of course, if there were no transactions and decision costs, there would be no need for markets and money. Markets and money exist because they reduce transactions costs; thus, Post Walrasians do not find this justification acceptable.

Alternatively, one could assume that there are transactions and decision costs, and that society takes these into account and chooses an institutional structure that appropriately eliminates those externalities that can be cost effectively eliminated, leaving only those externalities which are not cost effective to eliminate. (This is the "that which is optimal" view.) Considering any other equilibrium would be subject to the Nirvana Criticism. NeoKeynesian economics is implicitly based on this second argument; if it weren't, neoKeynesians could not use the single equilibrium production function they do. Post Walrasians argue that this second justification is also unacceptable. If it were true, there would be no need to have economists since what is optimal. If a rational society is investing in economists, society must believe that it is cost effective to study the economy to see if it can be improved. So society must not assume that the institutional structure of the economy is a priori optimal.

Since Post-Walrasians find neither of these two justifications acceptable, they argue that one cannot avoid the messiness imposed by interdependent choice. To do so is to assume away the central issues of macroeconomics⁹

The Macro Foundations of Micro and Post Walrasian Economics

⁹Such methodological questions that underlie the New Keynesian rejection of the independent choice assumption have been far from most New Keynesian minds, but those questions are important to consider in explaining why New Keynesian work deserves a separate classification.

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The need for a *macrofoundations of microeconomics* follows from giving up the independence assumption since without that assumption one cannot build up from a representative individual or firm to an analysis of the aggregate economy. In the post Walrasian view individuals' actions can only be understood or interpreted *contextually* within an aggregate model of the entire economy. To talk about individual action in a partial equilibrium context devoid of a discussion of how that context is influenced by the aggregate economy is meaningless. Thus, a meaningful macroeconomic foundation for micro must be developed prior to a meaningful microeconomic foundation for macro.

To see the implications of the above discussion, let us now reconsider the first question Mankiw and Romer ask to determine whether a work is New Keynesian: Does it accept the Classical Dichotomy? As with all Keynesian work the answer is “no; it doesn't,” but the reasons why Post Walrasians don't accept it are fundamentally different than the reasons why Walrasian Keynesians don't accept it. In this Post Walrasian work the failure of the Classical dichotomy is much more substantial than on the grounds of sticky prices or any Pigou effect. The Classical dichotomy is broken in the macro foundations of micro and hence in the initial institutional structure of the economy. No micro justification is needed for explaining why money affects the economy; one cannot talk meaningfully about the aggregate economy without having already built in money on the production side; money makes the economy more efficient, but that efficiency imposes certain institutional constraints on individuals, which break the dichotomy. You can't assume the efficiency gains of money without also assuming the institutional constraints imposed by money.

To say that money and the violation of the Classical dichotomy play important roles in Post Walrasian economics does not mean that you will find these issues discussed in much of the work I classify as Post Walrasian. The work is still in its infancy and much of it is still dealing with demonstrating that before one begins developing a microfoundation of macro, one must first develop a macrofoundation of micro which will

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choose among various equilibria, or at least limit them to a small number. The next step is to develop a way of analyzing the choice among alternative aggregate equilibria.

One approach would be to use a two part analytic approach in which one first analyzes the choice of institutions. Having done that one then analyzes how individuals choose given those institutions.¹⁰ A second approach advocated by Leijonhufvud (1993) is to use computer simulation to choose among alternative equilibria, and then to use the results of that simulation as one's macrofoundation of micro. It follows that any micro theorizing would have to be contextual to that simulation. A third approach is to use the real world as one's simulation and assume that society operates within the existing historically-given institutional structure which may or may not be optimal.

These three approaches are complements, not substitutes, and there is likely to be much debate about what is the appropriate macrofoundation of micro. However, regardless of which of the three approaches is used, the microfoundations of macro will be fundamentally different than anything that we now see in the neoKeynesian microfoundations of macro. That is why this work needs its own separate classification.

¹⁰I discuss this approach in Colander (forthcoming).

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Multiple Equilibria, Wage and Price Flexibility, and Unemployment

One of the reasons I believe Keynesian economics evolved into neoKeynesian economics has been the desire of Keynesian theorists to have their model lead directly to a theory of disequilibrium unemployment of labor. A prerequisite for disequilibrium unemployment to exist is non-market clearing wages. Hence the flexibility of real wages became a central focus of the analysis. In Post Walrasian approach economics, any theory of unemployment will be indirectly reached and will include an explanation why the institutional structure of an economy that can include some disequilibrium unemployment might be chosen by society over a full employment institutional structure. When wage and price level flexibility cause coordination failures, a full employment equilibrium is not necessarily preferred to an unemployment equilibrium.

What I am arguing is that too much wage and price flexibility has an institutional cost; it destroys the functioning of money and the financial institutions built around money. In the Post Walrasian approach it is this institutional cost of money that is inherent in the macrofoundations of money, not any menu cost of price adjustment, that explains why wages and prices are not perfectly flexible. It follows that any resulting unemployment is closely tied to the entire institutional structure of the economy, not just to fixed nominal wages or prices. Unemployment can only be understood relative to the choice of institutional structure. In this Post Walrasian approach all unemployment is structural in a much deeper sense than simply nominal wage and price structural inflexibilities. Such inflexibilities may cause some unemployment, but eliminating them will involve changing the entire structure and may increase, rather than decrease unemployment, since they may decrease coordination elsewhere in the system.

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