CHAPTER 1

Overview

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It has been 25 years since the microfoundations of macro became popular. The changes that have occurred in macro in these 25 years have been substantial. The whole conception of macroeconomics has changed from a Keynesian aggregate fine-tuning conception to a New Classical, policy-ineffective, microeconomic conception, to a New Keynesian "who knows what theory or policy to use" conception.

This book is an introduction to a line of thinking about the macro economy that stands in bold opposition to much of the macroeconomic literature not only of the last 25 years, but of much of the work of 25 years before that – the work that led to the microfoundations work. The approach to macro presented in this volume significantly differs from much of both Classical and Keynesian thought – whether prefixed by new, neo, or whatever. Thus, it is in opposition not only to the New Classical and New Keynesian macroeconomics of the last 15 years, but also to the NeoKeynesian and neoclassical macroeconomics of the last 50 years.

Given such strong claims it is only natural that one wonders how, after 50 years of development, can there be such a fundamentally different approach to macro? I can best answer that with an analogy. Say you are at the base of two mountains whose peaks are above the clouds. You want to climb to the higher peak which means that you must choose one of the two. You do; you choose Mountain A – the Walrasian mountain; you start working your way up the slopes further and further, until finally you get above the clouds. When you do, you see that Mountain B – let's call it a Post Walrasian mountain – is the far higher one. That's what we believe happened in macroeconomics.

This analogy should help explain why a dramatic new approach may be needed to further our understanding of macro issues and why a discussion of that new approach involves the foundations of economic analysis, not extensions of existing work. Whereas most of the debate in macro over the last 50 years has concerned whether we should follow this path or that path, the papers in this

volume will be arguing that the paths aren't the problem; the problem is the mountain – the core Walrasian foundation of macro theory.

The mountain analogy is also useful in explaining the profession's hesitancy to use the approach we advocate. It isn't easy to climb down a mountain, and start again up another mountain. The profession has already climbed so far up the Walrasian mountain, that there is a natural tendency to continue the climb, and to say to yourself – that's high enough. But most economists know, deep down, that it isn't high enough, although institutional incentives (like getting tenure and getting published) have, until recently, kept them from either accepting, or acting upon, what they know. Institutional incentives are now changing; most Walrasian paths have been followed to dead ends; and there is some very fancy math and game theory to apply to the Post Walrasian approach which offer large numbers of dissertation topics. Thus, we are hopeful that a number of younger economists will listen to our plea to move to the Post Walrasian mountain. (Older economists probably have too much invested in the Walrasian approach, and are not spry enough for the alternative climb.) To encourage fellow economists to accept that climb, I would point out that climbing the Post Walrasian mountain will go much faster since, in making that climb, many of the same techniques we have used in climbing the Walrasian mountain may well be relevant; it is the framework that is not.

1.1 Distinguishing characteristics of Post Walrasian macro

We've called the alternative approach to macro that we are advocating *Post Walrasian* to set it in distinct opposition to modern Walrasian or neoWalrasian work.[1] Before deciding on the term Post Walrasian, we explored many other terms: Marshallian macro, New Institutionalist macro, and Coordination macro. All had some votes, but, ultimately, we came to the conclusion that "Post Walrasian" is the best term because it most clearly directs economists to the distinguishing characteristics of our approach. These distinguishing characteristics are multiple equilibria and complexity, bounded rationality, and institutions and non-price coordinating mechanisms.

1.1.1 Multiple equilibria and complexity

Post Walrasian macro conjectures that the solution to a system of simultaneous equations as complex as is necessary to describe our economy has multiple equilibria and complex dynamics. This means that the aggregate economy cannot be meaningfully analyzed in the way that Walrasian economics analyzes it – within a comparative static model that assumes the existence of a unique aggregate equilibrium which is unaffected by dynamic adjustment processes. For a Post Walrasian, the interesting aspects of macroeconomics have all been assumed away by the Walrasian construction of the problem.

1.1.2 Bounded rationality

Post Walrasian macroeconomics conjectures that the macro economy is so complex that rational decision making in the context of a Walrasian-type general equilibrium system taken as a whole is impossible. This is in distinct contrast to Walrasian macroeconomics which conjectures that individuals can rationally deal with the complexity of the economic system and can process information sufficiently fast so that the resulting aggregate equilibrium reflects, in some way, a reasonable amalgam of their collective desires.

Post Walrasian macroeconomics does not give up rationality; it simply gives up global rationality as being beyond the processing capabilities of individuals. For Post Walrasians rationality has more local characteristics; it is bounded, not global, rationality.

1.1.3 Institutions and non-price coordinating mechanisms

The real world does not exhibit the chaotic results that would be the likely result of the two previous Post Walrasian conjectures. Walrasian advocates argue that this observation suggests that the Walrasian conjectures of unique equilibria and non-complex dynamics are the correct ones. Post Walrasians disagree; they see the reason why the aggregate economy is relatively stable is the existence of multilayered institutions – conventions, legal and social, that impose restrictions on 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 whereas they are seen as simply frictions in Walrasian macroeconomics. In Post Walrasian macro, institutions provide systemic stability and, thus, must be an integral part of the analysis.

These three defining characteristics are, of course, interconnected; the reason there are multiple equilibria is the economy's complexity, and the reason institutions exist is to reduce the complexity for individuals, and to reduce the number of equilibria the economy can reach.

1.2 The Post Walrasian indictment of Walrasian macro

The Post Walrasian indictment of Walrasian macro is that it has not taken the complexity of the aggregate economy seriously either in its assumptions of individuals' ability to deal with that complexity, or in the structure of its models. When considering the macro economy's complexity Walrasian macro economists have always blinked – and fudged the intuition behind the math – by which I mean they have structured the formal specification of the problem so as

to come up with a unique analytic solution using a system of comparative static equations with linear dynamics. Walrasian economists have always chosen to avoid dealing with that complexity, making Walrasian economics the equivalent of what Kenneth Boulding called "the celestial mechanics of a non-existent world."

Both Keynesians and Classicals have fudged, which has resulted in a wonderful charade. The two groups debate the relative merits of their respective fudges – Keynesians calling the Classical market-clearing fudge inconceivable, and Classicals calling Keynesians' fixed wage or price fudge *ad hoc*. Post Walrasians call both fudges unreasonable and *ad hoc* because the underlying analytic model of both is unreasonable and *ad hoc*; they are both on the wrong mountain.

Taking the complexity of the aggregate economy seriously undermines much of the theorizing that has been done in macro over the last 50 years. It means walking down the Walrasian mountain. For example, how can one look for rational micro foundations in a world that is so complex that on pure analytic grounds just about anything can happen. Yes, if one is careful enough to spell out an otherworldly (or, at least, other-islandly) story, one can come to an analytic solution that bears some relation to what we observe; but, for most, that analytic solution is intuitively unsatisfying as a description of the actual economy. Only people dealing in the same otherworldly world are interested in it. Yes, we can get graduate students to deal in that otherworldly world – if they are given no other choice – but is it one they would want to deal with if we didn't hold such "job or no job" power over them? We think not. Somehow, we need a more worldly macroeconomics – one that has a closer intuitive relation to the world within which we live.

The above argument is not about abstraction, or mathematics; it is about the intuitive foundations of the abstractions being made. Thus, while many past critics of Walrasian economics have based their criticism on the excessive mathematical nature of Walrasian models, I want to be clear that that is not the Post Walrasian criticism; if anything, the Post Walrasian criticism is that the mathematics used in Walrasian macroeconomics is too simple to correspond to the complex reality. The Post Walrasian critique of Keynesian and Classical models is that while they look impressive to non-mathematicians, to true mathematicians they are unsatisfying as descriptive of our economy. Thus, in Post Walrasian theory, you will see much discussion of mathematical tools that are at the outer edge of most economists' bag of tools – tools such as chaos theory and nonlinear dynamics.

The justification often given for the simple mathematics used in Walrasian macro is the need to have policy relevance. But to create a formally unsatisfying policy model that doesn't correspond to the way a reasonable policy maker sees the economy working can only lead to unsatisfying policy. About the only rea-

son I can think of for doing so is to give the policy analysis an inappropriate aura of science. I am not claiming that that is the conscious reason it was done, but I do believe that it is likely an unconscious reason pushing for such inappropriate mathematization. Thus, the Post Walrasian critique is an attack on Walrasian theory from both sides. On the one hand, if one wants to deal meaningfully with the mathematics, one had better significantly beef up one's mathematical tools in one's formal models. On the other hand, it argues that if one wants to deal meaningfully with policy, one had better beef up one's understanding of institutions. Walrasian theory has tried to walk the middle road, and the result has been an unsatisfying split – from both a theoretical and a policy perspective.

The views expressed above are shared, in varying forms, by all the authors in this volume, although many of the authors are more politic than I, and would not have put it so bluntly (and a couple of the authors are even less politic than I, and would have put it more bluntly). While they agree in general, the authors differ substantially about specifics. To condemn Walrasian macro is the easy part; deciding what to put in its stead is the hard part. This volume touches on the hard part, but, to be honest, it concerns mostly the easy part. By that I mean that the work presented here is suggestive rather than defining. Thus, what you will be presented with in this volume is not a research program, but instead a call for the establishment of one, and the outline for what that research program might look like.

It essentially is a crying out of a group of macro economists to the profession to work towards designing a macro model that is intuitively reasonable, but is still within the mainstream tradition. It is a cry for reasonable assumptions because the assumptions made by traditional macro theories – Keynesian and Classical – either define away most of the interesting issues in macro, or assume that individuals act in unreasonable ways. For example, how can you use a model of macro that has no role for money – a model in which the costs of inflation are trivial – to capture policy issues in an economy in which economic policy makers, and their economic advisors, see inflation as the biggest evil, and contractionary monetary policy as the best way to stop inflation?

1.3 Antecedents to Post Walrasian macroeconomics

The ideas in Post Walrasian macro have been around for a long time and I want to be clear that the contributors of this volume are making no claims that the ideas expressed here are new. Many economists have known the other mountain is there, and at times mainstream economists have talked as if they were on this alternative mountain. Thus, it is not surprising that there are many possible antecedents to Post Walrasian work in both Classical and Keynesian schools of

thought. For example, some will argue that early Classical economists, such as Dennis Robertson, or Frederick Hayek, understood the importance of complexity, and that Keynes's work undermined their attempt to deal with it. Others will argue that it was Keynes who really understood complexity, and that the neoWalrasians undermined Keynes. Certainly some non-mainstream interpreters of Keynes, such as Mary Timlin, Paul Davidson, and G.L.S. Shackle, have been talking about a Post Walrasian mountain, not a Walrasian mountain.

In addition, many of the contributors to this volume have been working in this Post Walrasian tradition for a long time, although their work and contributions often have been misinterpreted. Robert Clower and Axel Leijonhufvud's work is best known. What makes their work take on a new relevance is the New Classical challenge to Keynesian macroeconomics, which has undermined the neoKeynesian macro model. Their earlier work offers a reasonable Keynesian response to the New Classical challenge.

How can their work be a response to New Classical economics when it was done before New Classical economics was even known? I believe it is because they understood the New Classical arguments long before Robert Lucas formulated them, but they dismissed the New Classical response as unreasonable. They tried to deal with the issues in a more substantive way, but because their work challenged the foundations of Walrasian economic thinking, the profession shied away from, and misinterpreted, it. For whatever reason, while the Post Walrasian arguments have been made before, they have not been heard by the profession.

This book will not deal with these antecedent issues – it really doesn't matter who originated the ideas; what matters is that they are reasonable, and that they make intuitive sense. The argument in this volume is that, whoever developed it, the Post Walrasian approach to macro is a more reasonable way to analyze the aggregate economy than is the Walrasian approach.

1.4 Non-Walrasian and Post Walrasian macro

The issues being raised in this volume are, more and more, being raised by modern economists. Some of the best, such as Michael Woodford, or J.-M. Grandmont, have dealt with these problems in their models, and have created what might be called non-Walrasian models. Their work accepts the existence of multiple equilibria, and they seriously try to analyze how an economy might deal with these. But compared to the work presented in this book, they have gone only part way toward the Post Walrasian vision of the complex economy.

Their non-Walrasian approach is still trying to keep a foot on the Walrasian mountain – maintaining the assumption of global rationality. They do not see institutions as giving systemic rationality to the economy, and are still looking for a non-sequentially determined aggregate equilibrium. Post Walrasian macro sees the economy as too complex for such a non-Walrasian solution to exist. It

looks for a hierarchical system of sequentially solved equations – equations that on the lowest levels may have a unique aggregate equilibrium. That uniqueness is, however, institutionally determined; it is not inherent in the system independent of the institutions.

The Post Walrasian next step is that if there are a multiplicity of equilibria out there, then individuals would have to have some way to deal with deciding which of those multiple equilibria existed. The complexity of solving everything simultaneously would exceed the computing capabilities of not only macro economists, but also of the individuals in the economy, and alternative ways of solving the problems would be found. The way posited in Post Walrasian economics is that individuals accept conventions, and these institutional constraints upon their actions. These imposed institutional constraints create the sufficiently stable environment within which individuals can operate. If individuals were globally rational, the economy would be unstable. Notice the major change in the approach and view of rationality. In Walrasian economics institutional constraints on individuals prevent the attainment of optimality; in Post Walrasian macroeconomics the constraints are systemic requirements for stability. Without the institutional constraints, there would be no functioning economy.

This difference in view creates a major difference in the research program. In the Post Walrasian program the micro and macro problems must be solved simultaneously. One cannot assume competitive markets exist independently of individuals' incentives to set them up, or from observation. One needs a theory of institutions, of which markets are one, before one can analyze what markets do. To say the market will solve a problem is meaningless since it is unclear what the market is.

1.5 Rational expectations and Post Walrasian macro

The differences in approach go back to the original work on rational expectations. That work involved a research project considering the corn/hog model of fluctuations. Richard Muth and Herbert Simon, who were both working on it, felt that the standard answer – of expectations being based on last year's price – was too simplistic, but they disagreed on what the alternative should be. Simon argued that the institutions that existed would play a central role in the appropriate model. Muth disagreed; he argued that process and institutions did not matter: We should assume that the market would achieve equilibrium. His argument for doing so was simple and sound: Farmers aren't stupid; they have access to the best information, which includes economists' predictions, so if the supply demand model is the correct one, they have access to it, and hence will use the expectations of economists' model in making predictions.

Interestingly, Muth's proposed solution did not gain widespread acceptance, and was little known for 10 years after he published it. My suspicion why it did

not gain widespread acceptance is that it just did not fit in with most economists' intuition. They, for some reason, did not consider the inconsistency of their use of a unique, fully deterministic, supply demand model with an expectation that was inconsistent with that model.

The concept of rational expectations became well known in the 1970s when Robert Lucas and Leonard Rapping used it to solve a Walrasian general equilibrium macro model. This is, of course, a wonderful irony – economists were unwilling to use the rational expectations assumption in partial equilibrium models, but were willing to use it as a method of incorporating expectations into a general equilibrium system – a system requiring much more information processing. I suspect the reason why it was found acceptable there and not in single market analysis was the almost total intractability of the general equilibrium system without that assumption. Simon's goal – trying to specify a reasonable process in a single market – might have been a reasonable goal; the general equilibrium corresponding goal – trying to specify a reasonable process in a multitude of interrelated markets – was almost beyond comprehension. It was likely non-computable.

The rational expectations argument was very compatible with Classical economic thinking – markets work, and the assumption let one show formally that markets work.[2] It presented a fundamental challenge to Keynesians using a general equilibrium model; to use that model with any assumption other than rational expectations runs into logical consistency problems. An answer to the problem was earlier suggested by Alan Walters (1971). He pointed out that Muth's reasoning called only for "model consistent" expectations. Thus, there was nothing inherently rational about the rational expectations used by New Classical economists. What that meant was that if economists' model was not a supply demand model, but was, instead, a complex model that had no solution, any type of expectations could be rational expectations. Thus, to avoid the logical problem, all Keynesian economists had to do was to give up their model that had a unique equilibrium deterministic solution. It is that solution that Post Walrasians suggest. If Keynesians accept it, it means that their model is as logically consistent as the New Classical macro model.

The Post Walrasian answer to the rational expectations challenge is to agree that "model consistent expectations" are reasonable, but that to argue that the Walrasian general equilibrium model is not reasonable. With this answer one is brought back to Simon's approach to dealing with expectations – institutions and process are centrally important in the analysis of the economy.

Theoretically, this new work places macro in a strategic game-theoretic, rather than a functionally deterministic, setting. But it is a complicated layered game that is far too difficult to solve analytically. Yet, for an economy to work, that gigantic game must be solved in one way or another, and that means that coordinating devices – institutions – must be developed to reduce the number of

potential equilibria to a manageable number. Macroeconomics cannot be studied or understood without an understanding of these coordinating devices and the limitations these coordinating devices place on individual decision making.

1.6 Post Walrasian macro and New Keynesian macro

The term New Keynesian has been much discussed in the early 1990s. Unfortunately, much of what goes under the name New Keynesian makes the same leap of faith as does New Classical economics. In order to make its microfoundations tractable, many New Keynesian researchers have been forced to make "representative individual" assumptions using partial equilibrium analysis to consider the problems facing the aggregate economy. This representative individual approach implicitly accepts the unique aggregate equilibrium assumption, and sees macro problems as being created by deviations from that equilibrium.

The Post Walrasian approach advocated in the papers in this volume sees the macro problem differently than do the standard approaches. It rejects the representative individual assumption, and the unique equilibrium assumption. There are many alternative equilibria that the economy can reach; institutions limit those equilibria and create systemic stability, but in doing so they impose constraints on the individuals in the economy. Those systemic macro constraints must be considered in analyzing the representative individual considered outside the context of the aggregate within which that individual exists. One cannot assume them away. Thus the representative agent of the Post Walrasian macro is an agent who is constrained by institutional considerations. Spelling out those constraints is one of the tasks Post Walrasians have set out for themselves.

For modeling purposes, the Post Walrasian approach means there is an extra component of the production function that might be called a coordination component. This extra component eliminates the one to one relationship between inputs and outputs that exists with the standard aggregate production function. Given different degrees of coordination, the same physical inputs can yield quite different aggregate outputs. Some of the most important of the coordinating mechanisms in the economy are those that affect expectations.

1.7 Post Walrasian economics is a theoretical and methodological revolution, not a policy revolution

The Post Walrasian view that extra-market coordination mechanisms are necessary to bring about a desirable equilibrium may make it seem that Post Walrasian economics belongs on the activist side of the political spectrum. That is not the case. How to come to any policy decision depends on one's theory of how society deals with complexity, and there is no simple answer to that question. The Austrian spontaneous generation of institutions is one approach, and the Institu-

tionalist indicative planning approach is another. Both can fit in a PostWalrasian framework. The lack of any policy views automatically flowing from Post Walrasian macro can be seen in the authors represented in this volume. Their political views span the political spectrum; some follow from a New Classical laissez-faire approach, some follow a Keynesian activist approach, and some follow an eclectic approach. I don't even know what the macro policy views of a number of the contributors are. Nor do I care.

The Post Walrasian macro revolution is about how one approaches and analyzes the macro economy, not about what specific policies that analysis leads to. This distinguishes it from the Keynesian and New Classical revolutions which had either implicit, or explicit, policy agendas. I suspect that those agendas influenced their analyses – helping these researchers justify their intuitively unsatisfying assumptions: The assumptions had to be OK because they led to the right policy conclusion. It is precisely that connection between policy and model that I believe was wrong with the earlier approaches. Policy views should follow from, not lead to, economic models.

1.8 Description of the papers in the volume

The volume is divided into four sections. The first section deals with the conceptual foundation of Post Walrasian macroeconomics – the vision behind the approach. It includes three conceptual "thought pieces" that will be of interest to a broad group of economists, even those who do not see themselves as macro specialists. The second section contains three papers that deal with historical and analytical foundations of the macrofoundations approach. Those, too, should be of general interest.

The third section provides some specific complaints about Walrasian models and provides some alternative Post Walrasian models. These papers are at a slightly more technical level of discussion, but the authors avoid highly technical discussions and provide papers that give an interested reader an idea of what the technical approaches are, and how they relate to the Post Walrasian conception, rather than extend Post Walrasian theory. The final section relates Post Walrasian theory with Phelps's new structuralist theory, which is representative of the best of the modern development of Walrasian theory and policy. The book concludes with an annotated bibliography that should be useful to anyone planning to do research in this area.

1.8.1 The Post Walrasian vision

The leadoff paper in the volume, by Robert Clower and Peter Howitt, provides a general critique of the Walrasian (they call it neoWalrasian) approach. They argue that you can't just throw in institutions as you need them to make your