

# THE LIMITS OF MACROECONOMICS

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## Introduction

There is no disillusionment in learning that any field of study or any subfield, such as macroeconomics, has its limits. No set of ideas is limitless in any meaningful sense. Yet, the notion of limits attaches itself naturally to macroeconomics in a way that would seem almost unnatural if applied to microeconomics. Modern macroeconomics is constantly reaching in one direction for its microeconomic roots and in the other direction for its policy relevance. Pronouncements by contemporary macrotheorists, together with the track record of contemporary policymakers, are enough to make us doubt that macroeconomics can reach roots and relevance at the same time.

Shiela Dow (1985, p. 225) suggests that a fundamental difference between new classicism, which she includes in her treatment of mainstream views, and post-Keynesianism, which she favors over the mainstream, is that the new classicists allow their micro-based theory to delimit their policy prescriptions while the post-Keynesians allow policy relevance to guide their theoretical formulations. If we accept Dow's characterization, we can take the gulf that separates these two schools as a measure of the difficulties faced by macroeconomists in search of a theory that is both theoretically sound and policy rich. And these difficulties can be multiplied in accordance with the title of a recent book by Edmund Phelps, *Seven Schools of Macroeconomic Thought* (1990), which suggests a divergence of views rather than a convergence in the field of macroeconomics.

Somewhere between microeconomic principles and macroeconomic phenomena lies a market process whose complexity imposes strict limits on macroeconomic theory—and even stricter limits on

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macroeconomic policy. The second section of my paper deals with this complexity by drawing on pre-Keynesian treatments of capital theory and suggesting that considerations of the economy's capital structure allow for the most forthright and insightful integration of the critical time element into macroeconomic theorizing. The third section argues that capital-free treatments of time in mainstream macroeconomics can be seen as indirect and inadequate ways of coping with the thorny issues of capital theory. The fourth section identifies the limits of macroeconomics in terms of entrepreneurial expectations in the context of a complex capital structure. Finally, the fifth section considers the nature of the limits of macroeconomics and the implications for policy activism, institutional reform, and theoretical advancement.

### Capital Theory: It's About Time

Except for the Austrian school and some sectors of the Swedish and early neoclassical schools, the contending macroeconomic theories are united by a common omission. They neglect to deal with capital or, more pointedly, the economy's intertemporal capital structure in any straightforward and satisfactory way. Yet capital theory offers the richest and most promising forum for the treatment of the critical time element in macroeconomics. According to an early English view, capital puts a time interval between the beginning and end of enterprise (Jevons [1871] 1970, p. 226). In the Swedish construction, capital embodies the tying up of resources over time and is measured (in compound units of dollar years) by the waiting done by owners of capital (Cassel 1903, p. 96ff). The Austrians dealt with this same time element in terms of the "degree of roundaboutness" that characterizes the economy's production process (Böhm-Bawerk [1889] 1959, vol. 2, pp. 79–88 and *passim*). Each of these three formulations has served as a basis for theorizing about capital and could serve as a guide for devising a capital-based macroeconomics.

But capital considerations, to the extent they are accommodated at all in modern macroeconomics, are not well anchored in any of these early insights that link capital to time. In conventional income-expenditure analysis, enterprise has a beginning or an end, but not both. The existing structure of capital, summarily treated as the economy's capital stock, is taken as a given, an end of some process of accumulation whose beginnings are no part of the theory. Additions to the capital stock, investments, have only a beginning. Inspired by Keynes's animal spirits or by some other similarly unexplained

state of business confidence or profit expectations, current investment activity must eventually come to some end, but that end comes into view only in theories of economic growth, not in macroeconomics *per se*. The relationships among macroeconomic magnitudes in the context of beginningless capital and endless investment do not adequately reflect the time element in macroeconomics.

Capital in mainstream macroeconomics is neither marked by beginning and end nor conceived as Casselian waiting. Theoretical constructions in which investment is simply one of several categories of spending do not allow for the two-dimensional measure suggested by Cassel. Spending by consumers, investors, and the government during a given accounting period is measured in dollars and not dollar years. And if net investment is to be added to the existing capital, then capital too must be measured simply in dollars. A time dimension cannot be accorded capital and investment without destroying their conformability with the other spending magnitudes. But if, in the same theoretical construction, the rate of interest is conceived as the price of capital, an internal inconsistency is introduced. Dimensional conformability requires that the interest rate must be the price of something measured in dollar years.<sup>1</sup> The common practice of glossing over such difficulties in capital theory by not explicitly assigning dimensions to capital was noted early on by Joan Robinson ([1953] 1971, p. 47). Flagging such dimensional difficulties here is not intended, as Robinson would have had it, as a prelude to a wholesale dismissal of neoclassical production theory but rather as further justification for maintaining an explicit time dimension in the concepts of capital and investment—and particularly in the treatment of the economy's capital structure as incorporated into macroeconomics.

The Austrian concept of "roundaboutness" is typically conceived as an average period of production and is expressed simply in years. It is the time dimension distilled from the dimensionally complex concept of waiting. If roundaboutness has been averaged over a total capital value, then there is a corresponding total roundaboutness that is conceptually equivalent to Casselian waiting. But roundaboutness, like waiting, plays no role in mainstream macroeconomics. It has been rejected on two grounds. One is an argument, initially made by John B. Clark (1924) and later defended by Frank Knight (1934), that in an ongoing economy production and consumption are, in effect, simultaneous. Accordingly, roundaboutness, if at all definable,

<sup>1</sup>For an application of dimensional analysis to the issue of the interest rate as a price, see Garrison (1988, pp. 49–51).

is irrelevant. The other is the demonstration—implicit in the work of Piero Sraffa (1960) and explicit in a key article by Paul Samuelson ([1966] 1971)—that there is an inherent difficulty in ranking production processes either on the basis of capital intensity or on the basis of the (average) roundaboutness associated with each.

The first claim that production time is irrelevant lacks plausibility; the second claim that roundaboutness, which has both a value dimension and a time dimension, is uniquely related to neither of the two separate dimensions is not in doubt. Nor is it in doubt, for that matter, that the inverse relationship, emphasized by the Austrian economists, between roundaboutness and the interest rate is clouded by the *definitional* dependence of roundaboutness on capital value and hence on the rate of interest. But neither Knight nor Samuelson—nor anyone else—has provided adequate grounds for ignoring or downplaying the admittedly complex time element embodied in capital and investment.

The fact that conventional macroeconomics does not incorporate a capital structure or a time element in any fundamental way has telling consequences in terms of possible directions for development of macroeconomic theory and provides a basis for identifying and evaluating different schools of macroeconomic thought. If the economy's capital structure is not an integral part of the theoretical construction, then the market mechanisms that create and maintain that structure can be treated only in some summary of fragmentary fashion. A casual survey of macroeconomic literature suggests that there are two summary techniques and many of the fragmentary variety. The greatest contrast is exhibited between theories that assume these market mechanisms work perfectly well (and hence need not be analyzed) and theories that assume these markets mechanisms are totally dysfunctional (and hence cannot be analyzed). Representatives of the works-perfectly-well theories include much of monetarism and most of new classicism; representatives of the totally dysfunctional theories include fundamentalist Keynesianism as rooted in Keynes's 1937 restatement of his *General Theory* as well as Austro-Keynesian nihilism as expounded from the Keynesian side by G. L. S. Shackle (1974) and from the Austrian side by Ludwig M. Lachmann (1976).<sup>2</sup>

Theorists who do not incorporate a capital structure in their macroeconomics but reject either of the two extreme assumptions about the efficacy of the market mechanisms that create and maintain that

<sup>2</sup>For an extended capital-based contrast of Keynesianism and monetarism and a treatment of the Austrian alternative as a middle-ground position, see Garrison (1984, 1989).

structure are left to pick and choose in ad hoc fashion. They must select from among many aspects of the market process some aspect of it that is thought to be particularly significant and worthy of attention. For Keynesianism as set out by income-expenditure analysis, expectations, which are explained largely by group psychology, dominate in determining the level of investment. The interest rate, which is governed largely by changes in liquidity preferences, plays a subordinate role in investment decisions, as reflected in an interest-inelastic demand for investment funds. For post-Keynesians, mark-up pricing made possible by oligopolistic elements in the economy satisfy the needs of the capitalist class for internal finance and enable investments to be undertaken. For new Keynesians, contracting costs for labor, which result in wage and price stickiness and in staggering of wage-rate adjustments, weigh heavily in translating parametric changes into changes in levels of employment and investment.

To single out aspects of the market process not explicitly related to the time element in the economy's capital structure is to overlook the intertemporally complex relationship between successive periods of investment and the resulting pattern of output. In theories with atemporal explanations of the level of investment in each period, the capital stock can be nothing other than a simple sum of the separate investment magnitudes. One notable theoretical development within new classicism, however, centers around an aspect of the market process explicitly related to the critical time element. Investment in each period consists partly of new investment and partly of continued investment, which reflects earlier—and possibly regrettable—investment decisions plus what is called time-to-build considerations (Kydland and Prescott 1982). Although the distinction between new and continued investment in the context of a theoretical construction that otherwise has no structure of capital is an ad hoc distinction, it is nonetheless one that is rooted—or at least could be rooted—in the most fundamental insights linking capital and time.<sup>3</sup>

<sup>3</sup>In view of their own critique of mainstream macroeconomics, the new classicists will not take lightly the charge of "ad hocness." But distinguishing between new and continuing investments has no theoretical basis in new classicism. Without a theory of capital structure, the distinction can mean only new or continued involvement of a particular firm. But for macroeconomic relevance, the distinction must apply to the economy's capital structure. The firm-based distinction and the structure-based distinction would be equivalent only if all production processes were characterized by complete vertical integration.

## Adjectival Time

How many different kinds of capital are there in a capital-using economy? Surely there are many, although most of macroeconomics pretends that there is only one. The capital stock grows monolithically as each year's investments are added to it. How many kinds of time are there in a capital-using economy? Surely there is only one kind of time, which underlies all macroeconomics, all economics, all social science, all science, and all reality as we know it. Nonetheless, a casual survey of modern macroeconomics literature reveals a proliferating taxonomy of time: calendar time, mechanical time, analytical time, Newtonian time, Bergsonian time, real time, historical time, expectational time, market processes that are "in time," and market processes that are "out of time."

The long list of adjectives that have been appended to time partly reflects both a variation in writing style and a lack of standardized terminology. Admittedly, several contrasting pairs can be gleaned from the list to express the same—or very similar—meaning. For macroeconomists who think in terms of the economy's capital structure but who read a macroeconomics literature free of such considerations, adjectival time takes on a special meaning. The taxonomy of time is a surrogate, however cryptic and otherwise inadequate, for a taxonomy of capital; it sheds only the most indirect light on the market processes that maintain and modify the economy's intertemporal capital structure.

There are two analytically separable—though actually interrelated—sets of issues for which kinds of time are proxies for other, more substantive aspects of a capital-using economy. One set of issues, which turns on the distinction between historical and analytical time, has to do with the nature of the economy's capital structure; the other set of issues, which makes use of expectational time, has to do with entrepreneurial decisions that lead to the maintenance or modification of the capital structure.

Historical time, which is characterized by an essential irreversibility, is commonly contrasted to analytical time, which, purportedly, can run in both directions. Movements in analytical time are analogous to movements in space. In analytical time, eggs can be cracked and then uncracked; volcanoes can erupt and then unerupt; investment projects can be commenced and then uncommenced. In historical time, some things—cracked eggs, erupted volcanoes, and committed capital among them—cannot be undone. While the notion of time running in both directions, even as a thought experiment, will not survive critical contemplation (How about all six directions? At

the same time?), the issues addressed can be given more direct—and therefore less cryptic—expression by considering the nature of the economy's intertemporal capital structure.

Capital goods that make up the structure differ in terms of durability and specificity. Relationships among the heterogeneous collection of capital goods vary in degrees of both atemporal and intertemporal substitutability and complementarity. If capital goods were wholly nonspecific, if the collection of them were fully homogeneous so that any one capital good is a perfect substitute for any other, then production processes could proceed as if time ran both ways. A half-finished performance hall could be completed—with no effects on cost or construction time—as a bowling alley; the production process that yields musical instruments could—with an eleventh-hour change of mind—yield bowling pins and bowling balls instead. It would be as if the construction of a performance hall and the making of musical instruments, once commenced, were then uncommenced to facilitate the construction of a bowling alley and the production of bowling equipment. The total production time—into which the backward-moving components of time enter negatively—would be no greater than if bowling had given shape to the production process from the start.

Treatments of macroeconomic issues in which historical time is played off against analytical time are capital-based macroeconomics in silhouette. To feature time irreversibility is to recognize that the intertemporal capital structure has a particular profile. But the black-and-white distinction between historical and analytical time is too crude and too cryptic to shed any light on the actual complexity of the capital structure and on the causes and consequences of capital maintenance and capital restructuring.<sup>4</sup>

Expectational time is a phrase that refers to a time horizon rather than to the actual passage of time in one direction or another. For what period of time do investors plan? The formation of expectations and the commitment to investment undertakings have a critical time dimension in macroeconomics. But the acts of forming expectations and making commitments are largely unanchored in mainstream macroeconomic theory; they lack both subject and direct object. The subject of such acts is the entrepreneur, who has a shadowy existence in most of mainstream economics: in microeconomics as well as

<sup>4</sup>It could be argued that the distinction made here and in subsequent sections between maintenance and restructuring is itself too crude. The intent is to include as maintenance all sorts of market-specific adjustments that macroeconomics can safely ignore and to include in restructuring the systematic shifting of resources within the structure of production that alters the intertemporal pattern of output.

macroeconomics. The proximate objects of such acts are the components of the capital structure; any contemplated additions or modifications are evaluated in light of the capital structure as it is currently perceived to exist.

The attempt to finesse a theory of entrepreneurship in the context of a complex intertemporal capital structure by incorporating expectational time into macroeconomics has had but little success. Polar contrasts can be made (as in Keynes [1936] 1964, chap. 5) between short-run expectations (which are formed and reformed continuously and confidently on the basis of timely and relevant feedback) and long-run expectations (which are totally baseless acts of imagination). And plausible claims can be made about changes in planning horizons attributable, say, to a change in the rate of technological progress or to an increase or decrease in stability of a policy regime. But identifying the macroeconomic significance of changing expectations that cause investment activity to turn from maintenance of a given capital structure to structural modification requires more than considerations of expectational time can deliver. Explicit consideration must be given to the capital structure itself and to the entrepreneurs who form expectations on the basis of their perception of it.

### Does It Matter That Expectations Are Subjective?

Reflective writings on economic theory acknowledge the essential subjective character of its fundamental concepts. Consumption utilities, even costs, and certainly entrepreneurial expectations are subjective in ways that few economists would dispute. For issues of basic methodology and philosophy of science, subjectivist considerations are given great weight. And in modern macroeconomics, schools of thought can be categorized on the basis of whether or not—and to what extent—they give play to the subjectivity of expectations.

The polar extremes identified earlier, Keynesian fundamentalism and new classicism, can serve to illustrate. In the first extreme, critical questions about the state of long-term expectations, about the profitability of investment activities, guide discussion about the future of the macroeconomy. However, answering such questions with Keynes's oft-quoted punchline that "We simply don't know" cuts discussion short. In the second extreme, it is postulated that entrepreneurs, if not economists, *do* know or that they behave, collectively, as if they do. With the assumption of rational expectations, the essential subjectivity of entrepreneurial expectations is downplayed if not completely eliminated, as is the distinction between the past and the future.



Identifying the limits of macroeconomics requires that we reject both polar extremes. Rather than make some assumption that either features or hides the subjectivity of expectations, we must seek a substantive answer to the question "Does it matter that expectations are subjective?" Considerations of the nature of entrepreneurial activities in the context of a complex intertemporal capital structure suggest a hedged answer: "Sometimes it doesn't, and sometimes it does." In the most general terms, our specific answer depends on whether the intertemporal structure of capital is simply being maintained or is undergoing systematic modifications in the face of some economywide change in market conditions.

Karen Vaughn (1980) has offered and defended a substantive answer to the similar and possibly more fundamental question "Does it matter that costs are subjective?" As a preliminary to policy prescription, this question about costs in the economically relevant sense of the subjective valuation of foregone opportunities becomes "Do observable market prices accurately reflect inherently unobservable costs?" Vaughn argues that they do but only under conditions of full equilibrium. She then juxtaposes this conclusion with the more common belief that policy intervention finds its greatest justification in conditions of persistent disequilibrium (Vaughn 1980, p. 710f).

Costs, the consideration of which underlie policy prescription, can be objectively measured only when there is no need for policy. This is the essence of the conundrum identified by Vaughn. A similar conundrum, conceived possibly as a corollary to the subjective-cost conundrum, identifies the limits of macroeconomics in terms of subjective expectations. Entrepreneurial expectations about the future can be surmised from entrepreneurial activity of the immediate past only in the instance in which entrepreneurs are pressing ahead to complete the projects that they have already initiated. Such a situation might occur if, under unchanged market conditions, market forces have been working and continue to work to maintain an intertemporal equilibrium. That is, only when entrepreneurial expectations about the future can be accurately represented as a projection of recent and ongoing entrepreneurial activity does the essential subjectivity of expectations not matter. Thus, the macroeconomic theorist can be confident that considerations of subjective expectations pose no difficulty for his theory only in circumstances in which there is no need for macroeconomic policy.

In circumstances of systematic intertemporal discoordination, however, considerations of expectations must dominate macroeconomic theorizing. Suppose that near the end of a period of economic

expansion, it becomes clear to entrepreneurs—and even to economists—that market conditions favorable to continued expansion are unlikely to prevail. For the argument at hand, it does not much matter whether the economy is in the final throes of a demand-driven boom or on the eve of some dramatic but only vaguely anticipated change in supply conditions. In either case, macroeconomic theory has to deal with the fact that entrepreneurs are no longer pressing ahead but are instead adapting to change. And entrepreneurs' adaptations are guided by their expectations about the new market conditions and about how other entrepreneurs are likely to adapt.<sup>5</sup>

In a period of macroeconomic disequilibrium, when actions in the future are not simple extrapolations of actions in the recent past, all the thorny issues of capital theory come into play. What is the best thing to do with a half-completed performance hall in light of the changing market condition? Some such projects will be completed almost as initially planned; others will be completely liquidated. Some will be modified in various degrees in terms of the resources and techniques used; others will be altered to some small or great extent in terms of the ultimate objective. Thus, considerations of capital specificity and durability and of atemporal and intertemporal substitutability and complementarity among capital goods and between capital goods and other resources, as perceived subjectively by each entrepreneur, all come into play (Lachmann [1956] 1978).

What I have offered as a subjective-expectations corollary to Vaughn's subjective-costs conundrum can itself be expressed in terms of subjective costs. Under conditions of full competitive equilibrium, costs at the margin are adequately measured by observable market magnitudes. The entrepreneur borrows funds at the market rate of interest and undertakes projects that are just worthwhile. What is popularly called the "cost of capital" refers to both the rate of interest and the rate of return for the entrepreneurs whose activities maintain the marginal conditions. But it is precisely these marginal relationships that are nullified by an economywide disturbance. Macroeconomic disequilibrium drives a wedge between the rate of interest and the newly formed expectations about the rate of

<sup>5</sup>In application, the distinction between "pressing ahead" and "adapting to change" parallels the distinction between maintenance and restructuring as spelled out in footnote 4. Also, it should be noted that Vaughn's subjective-cost conundrum turns on the distinction between full equilibrium, which exists only in the textbooks, and disequilibrium, which characterizes market processes as we know them. My subjective-expectations corollary turns on the distinction between actual market processes as they function under normal conditions and those same market processes as they function in the face of some economywide disturbance.

return on projects that were initiated before the disequilibrating disturbance. When capital maintenance turns to capital restructuring, the activities of entrepreneurs can no longer be explained in terms of marginal conditions and observable interest rates: It is a poor entrepreneur whose next best alternative is the bank rate of interest.<sup>6</sup>

Macroeconomic theory that translates changes in market conditions into movements in macroeconomic variables must hinge critically on the actual and perceived relationships that characterize the economy's intertemporal capital structure. In macroeconomic disequilibrium, it matters greatly that entrepreneurial expectations are subjective. The theory, in fact, is no better than its treatment of expectations. Thus, in the very circumstance of some economywide disturbance Vaughn's conundrum looms large: The greater the perceived need for stabilization policy, the more tenuous the theory on which such policy is based.

Further, by implementing policy either on the false premise that the subjectivity of expectation does not matter or with the realization that it does—somehow—matter, policymakers have the effect of making the theory even more tenuous. This compounding effect, which involves the interplay between theory and policy, will be recognized as central to the Lucas critique and to Newcomb's decision problem as applied to policy activism. However, the conundrum highlighted here is independent of, and logically prior to, those identified by Lucas and Newcomb.<sup>7</sup>

### Demand-Siders, Supply-Siders, Both and Neither

Attention to the economy's intertemporal capital structure virtually precludes dealing with macroeconomic problems and formulating macroeconomic policy in terms of aggregates that summarily relate the demand side of the economy to the supply side. Intertemporal discoordination upsets supply-and-demand relationships within the capital structure, so that the time-consuming process that transforms the economy's basic resources into products that satisfy consumer

<sup>6</sup>A key difference between growth theory and macroeconomic theory can be stated in terms of the interest rate's serviceability as a measure of the relevant opportunity cost. The centrality of the interest rate in growth theories, which typically concern themselves with the economy's equilibrium growth path, is not in doubt; the significance of the interest rate in macroeconomics, which typically deals with circumstances in which marginal conditions have been upset on an economywide basis (e.g., by a collapsing demand-driven boom or by a supply shock) is a matter of some controversy.

<sup>7</sup>The Lucas (1981) critique is based on the market participants' ability to anticipate policy; Newcomb's decision problem, as applied by Frydman et al. (1982), arises when market participants and policymakers try to anticipate one another.

demand is characterized by a complex pattern of excess supplies and excess demands. The problem of identifying and dealing with the specific and interrelated excesses is, in the final analysis, an entrepreneurial problem. The solution to the problem requires some systematic tendency for entrepreneurial expectations to be correct; hence, the solution requires institutional arrangements that automatically reward correct expectations.

Macroeconomic debate over the past several decades has been dominated by Keynesian policy activists, who advocate demand-management policies; by their monetarist critics; and by supply-siders, who have attempted to shift the focus of policy from the demand side of the economy to the supply side. Each side of the market has served as the basis for effective political rhetoric, as exemplified by the demand-oriented Democratic administrations of the 1960s and the supply-oriented Republican administration of the 1980s. Pointing to periods during which such one-sided policies for managing the macroeconomy were actually pursued effectively or even consistently is, of course, another matter.

Adding capital theory to macroeconomics as the most direct and explicit way of accommodating the critical time element in economic relationships warns against exclusive focus on either side of the market. Considerations of expectations and the critical role of the entrepreneur suggest that there may be an unbridgeable gap between macroeconomic theory and activist policy. The conundrums inherent in capital-based macroeconomics imply a balance in terms of sides of the market and a contrast between theory and policy: On analytical issues, macroeconomists should think of themselves as "both-siders"; on policy issues, as "neither-siders." Macroeconomic theory can shed light on the nature of the problems that entrepreneurs face in conditions of economywide disequilibrium; policy activism can do little to help solve what in essence is an entrepreneurial problem.

Spelling out the limits of macroeconomics in terms of capital structure and entrepreneurial expectations is not intended to imply that macroeconomics should be abandoned entirely in favor of microeconomics. Here too the intended implications turn on the distinction between theory and policy. For policy, clearer recognition of the limits of macroeconomics strengthens the case for rules over discretion. It argues for the abandonment of policy activism in favor of institutional reform. If policy activism is unlikely to get the economy out of macroeconomic difficulties, institutional reform that, among other things, eliminates the threat of policy activism may well keep the economy from getting into macroeconomic difficulties.

For theory, the explicit detailing of the limits of macroeconomics points to possible margins where theory might be improved. More pointedly, translating macroeconomic ideas, which are expressed in the language of adjectival time, into the macroeconomics of capital structure may have an especially high payoff. And paying attention to the particular kinds of problems that entrepreneurs face during periods of economywide capital restructuring may provide the soundest basis for reforming the economy's macroeconomic institutions.

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