The Austrian Theory of the Business Cycle in the Light of Modern Macroeconomics

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The Austrian theory of the business cycle has many critics. Some believe that this part of the Austrian contribution is so misdirected as to constitute an "embarrassing excrescence" (Yeager [1986, p. 378]); others simply doubt that there can be a single theory that provides a general account of cyclical activity (Leijonhufvud [1984, 1986]; see also Sirkin [1972] and Lachmann [1978]); and still others deny the existence of some of the most salient features of business cycles.[1] Defending—or even discussing—the Austrian theory of the business cycle, then, requires some careful groundwork.

There are a number of expositions of the Austrian theory in the literature, which for the most part are complementary (e.g., Hayek [1967, 1975b], Mises [1966, pp. 538–86], Mises et al. [1983], O'Driscoll [1977], Robbins [1934], and Rothbard [1975]), but because business cycles remain a live issue inside as well as outside the Austrian school, there is no—and can be no—canonical version. Gordon Tullock, who took an exposition by Murray Rothbard to be canonical, has identified perceived shortcomings of the Austrian theory in an article entitled "Why the Austrians Are Wrong About Depressions" (Tullock, [1987]).[2] The present article was initially motivated by Tullock's basic objections as well as by his "nit picks," as he calls them. But even his title is evidence of a misunderstanding. The Austrian theory is not primarily about depressions; it is about artificial booms and about the market process that brings them to an end. The theory sheds light on the kind of readjustments needed on the eve of the bust, but the issue of the depth and length of the ensuing depression as measured by the massive unemployment of labor is dealt with by the Austrians in ways that are similar to several other schools of thought.

Though inspired by Tullock's critique, the present article has an organization of its own—one that is responsive to other modern critics as well. Section I

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considers the very existence of business cycles in order to lay the groundwork for evaluating the Austrian theorizing about them. Section II identifies essential differences between allocative distortions caused by legislation and allocative distortions caused by monetary expansion, linking the latter with cyclical characteristics of resource movements. Section III establishes the significance of capital theory in theorizing about the business cycle. Section IV after that provides some justification for the Austrian approach by considering how rival schools theorize in lieu of a theory of capital. Section V offers a summary evaluation.

I. The Existence of Business Cycles

Business Cycles as Econo-Rhythms

There is a sense in which it can be claimed that business cycles do not exist. If by cycles we mean continuous rhythmic movements in macroeconomic magnitudes, then there are no business cycles. The so-called long wave supposedly identified by Nikolai Kondratieff on the basis of two and a half cycles is the product of creative empiricism and has no basis whatever in theory (See Rothbard [1978], who evaluates Shuman and Rosenau [1972].) Short waves traced out by chartists, or technicians, are equally baseless. Their triple peaks, triple troughs, heads and shoulders, and the like are no more real than faces in the clouds.

Casual inspection of statistical data for economic aggregates such as total output, employment of labor, or net investment suggests a lack of cyclical regularity. Apart from obvious seasonal variations in some sectors of the economy (variations that require no special explanation), it is futile to attempt to identify a frequency and amplitude of some supposed sinusoidal movement. It can be—and has been—argued that the economy is much too complex for any one particular wave to be readily observed. Economic activity is characterized, according to Schumpeter (1934), for instance, by a number of cyclical movements of different frequencies and amplitudes. Kondratieff, Juglar, and Kitchin called attention to the existence of cycles with frequencies of fifty years, nine years, and five years, respectively. Schumpeter suggested that actual patterns of economic activity reflect the combined effects of all such cycles.

But theories about a composite cycle are no more sound than the theory of each of the component waves. Further, any supposed confirmation on empirical grounds of the Schumpeterian view is inherently misleading. As a purely mathematical matter, *any* single-valued function, such as the time pattern of some economic magnitude, can be represented by a Fourier series, which combines an infinite number of sinusoids of different frequencies and amplitudes. The coefficients of a specific Fourier series may describe some particular set

of macroeconomic data, but if the economics of business cycles is to be more than descriptive, cyclical movements must qualify as such on theoretical grounds.

Business Cycles as Monetary Disequilibria

While there are no built-in econo-rhythms in the market process, there are, from time to time, economywide disturbances of one sort or another. Attempts to identify rhythmic components in economic activity, according to Sirkin (1972) and others, are just misguided attempts to understand these macromaladies. Axel Leijonhufvud (1984) has made headway toward our understanding of macromaladies and of competing theories about them by creating a useful taxonomy. Basic categories are defined in terms of (1) the nature of the disturbance and (2) the nature of the failure of the economy to adjust to the disturbance. The two "natures" are then categorized as *n* (for nominal) or *r* (for real).

This approach gives rise to a two-way taxonomy that can be symbolized as *n/n, n/r, r/n,* and *r/r.* To illustrate, suppose that there is a general, but unanticipated, shift of preferences on the part of wealth holders to a higher level of real cash balances. This is a *real* disturbance. Suppose further that there is some difficulty in the pricing mechanism for both inputs and outputs, which impedes the necessary decrease in the general price level. This is a *nominal* failure. Until the pricing difficulty is overcome, there will be excess supplies of commodities and factors of production on an economywide basis. This macromalady belongs to the *r/n* category.

Leijonhufvud recognizes that his categories represent the pure cases and that it is possible to have disturbances and adjustment failures where both are partly nominal and partly real. He demonstrates, though, that the taxonomy is useful in sorting out the sequential rounds of debate between Keynesians and Monetarists. More generally speaking, historians of economic thought armed with Leijonhufvud's categories can readily detect when opposing theorists are simply talking past one another (theorizing about different sorts of disturbances) and when they have actual disagreements (about how the market reacts to a particular sort of disturbance). Leijonhufvud also shows that the historical relevance of macromaladies of a particular category depends critically upon the nature of the existing policy regime.

Leland Yeager (1986) draws attention to a particular sort of disturbance followed by adjustment failure that, in his judgment, is especially relevant for understanding depressions and hence for devising institutional reform aimed at avoiding them. A decrease in the money supply in the face of an unchanged money demand causes the prices of all commodities and factors of production to be above their market-clearing levels. While the market can eventually bring prices into line with the smaller money supply, it cannot achieve a new monetary equilibrium quickly or painlessly. The theory of "monetary disequilibrium"—a term with which Yeager ties his own ideas to those of Clark Warburton (1966)

—focuses on the difficulties of achieving economywide price adjustments made necessary by a monetary contraction. Clearly, this focus puts monetary disequilibrium theory in the *n/n* category of Leijonhufvud's taxonomy.

The market's inability to bring about rapid adjustments in prices on an economywide basis guarantees that quantity adjustments will occur instead. That is, the failure—or sluggishness—of nominal equilibration brings on real disequilibration. And as is recognized in almost all macroeconomic theories, a decrease in real output can, through an income-constrained process, induce further decreases. Keynesians envision a "spiraling downward" of income and expenditures. In Yeager's terminology, "the rot can snowball" (1986, p. 371). Austrians refer to this same phenomenon as a "secondary depression" (Hayek [1975a, p. 44]), a term which reminds us that the primary maladjustment is something else.

In monetary disequilibrium theory, the problems caused by price-level sluggishness are further compounded by the fact that not all prices are equally sluggish. A gradual and uneven adjustment in the price level creates a period during which relative prices are pushed away from their equilibrium levels. (The *n/n* malady is contagious and can easily spread to the *n/r* category.) By the time the market reestablishes an equilibrium in terms of both relative and absolute prices, the economy can suffer substantial losses in terms of both misallocated and unallocated resources.

For those who take their cue from Warburton, monetary disequilibrium theory is believed to have broad historical applicability. Any economic downturn involving a monetary contraction is to be understood in terms of the fundamental difficulties of price-level adjustment. Such difficulties should dominate, in this view, any reasonable account of the Great Depression. The theory sheds no light on the problems inherent in a credit-driven boom such as occurred during the 1920s, and it does not explain—nor does it purport to explain—why the money supply began to fall at the end of the 1920s or why there was a prolonged monetary contraction spanning the years 1929–33. It does, however, identify one of the reasons for the economy's poor performance during and immediately after the contraction.

Business Cycles as Self-Reversing Market Processes

In the first view spelled out, business cycles are an inherent part of the market process; in the second, they are disruptions of the market process. That is, both the lower turning point (the upturn) and the upper turning point (the downturn) are *endogenous* for those who conceive of business cycles as econo-rhythms, and *exogenous* for those who think in terms of monetary disequilibrium. Contrasting econo-rhythms and monetary disequilibria in this way suggests another, more conventional taxonomy, in which business-cycle theories are categorized on the basis of the exogeneity (*X*) or endogeneity (*N*) of the lower and upper turning points (Hansen [1951, p. 411ff.]). The four categories

can be symbolized as *X/X*, *X/N*, *N/X*, and *N/N*, where *X/X* is monetary disequilibrium theory and *N/N* is econo-rhythm theory. It is difficult to identify any simple relationship between this taxonomy and the one devised by Leijonhufvud. However insightful his treatment of market adjustments to monetary disturbances, Leijonhufvud never explains how—or suggests that—a boom engenders a bust or vice versa.[3]

The Austrian theory of the business cycle falls squarely into the *X/N* category. The exogeneity of the upturn is a clear recognition that the economywide disturbance is inflicted on the market process and is not an unavoidable feature of market economies. The endogeneity of the downturn gives a cyclical quality to the movements in prices and quantities and to certain macroeconomic magnitudes. The Austrian business cycle, then, is less of a cycle than the supposed econo-rhythms, but more of a cycle than sluggish-price monetary disequilibria.

In the broadest terms, the Austrian theory is a recognition that an extramarket force (the central bank) can initiate an artificial, or unstainable, economic boom. The money-induced boom contains the seeds of its own undoing: the upturn must, by the logic of the market forces set in motion, be followed by a downturn. Note that the words *induced* and *unsustainable* are consistent with the *X* and *N*, respectively, that define the *X/N* category of business-cycle theory.

The Austrian theory also qualifies, along with monetary disequilibrium theory, as a monetary theory of the business cycle. "Money matters" in both theories—but for different reasons. Further, if the Leijonhufvud taxonomy is applied to the entire sequence of events from the initial upturn to the subsequent downturn, then the Austrian theory would fall into the *n/r* category. As summarized by Fritz Machlup (1976, p. 23), "*monetary* factors *cause* the cycle but *real* phenomena *constitute* it." For Yeager and Leijonhufvud, monetary mismanagement precipitates a bust; for Mises and Hayek, monetary expansion engenders a boom, which eventually leads to a bust.

The Austrian theory is to be fundamentally distinguished from monetary disequilibrium theory by its emphasizing that "relative prices matter." The more prevalent claim that "money matters" derives from considerations of money-induced changes in the price level and sometimes of changing relative prices as the market process makes piecemeal adjustments toward monetary equilibrium. But for the Austrians, relative-price changes form the core of the theory. Money-induced changes in relative prices cause corresponding changes in the pattern of resource allocation. The self-reversing character of the market process set in motion by the injection of newly created money manifests itself most significantly in that aspect of the process that allocates resources over time—in the intertemporal structure of capital as governed by the interest rate. Alternatively stated, the observed cyclical quality of the market process consists in a *temporary* disruption of *intertemporal* market mechanisms.

II. Legislated Distortions and Monetary Distortions

The government implements all sorts of policies and programs that cause the price of some particular good to be above or below its market level. Interventions in the form of taxes and subsidies, price floors and ceilings, tariffs and quotas are, from a narrowly economic point of view, permanent in their effects on resource allocation. A subsidy to home building, for instance, will result in a larger-than-otherwise investment in housing so long as the subsidy is in effect. It is possible, of course, that some regulatory schemes can create a political dynamic that eventually results in deregulation. Government-enforced cartelization of the airlines, for example, led to an eventual competing away of monopoly profits by the members of the cartel, which eroded the political support for continued regulation. The political forces for deregulation eventually prevailed. But apart from considerations of such political dynamics, legislative interventions by government have a certain permanence about them.

Legislated distortions of the price system play no direct role in cyclical movements of economic magnitudes precisely because of their quality of permanence. By contrast, monetary distortions do play a direct role in business cycles precisely because—and to the extent that—they are inherently impermanent. The market's distribution of income and hence of spending patterns, gives rise to a certain pattern of prices. The pattern can be altered by the spending of newly created money on some particular good or category of goods. But the initial price increases brought about by monetary injections, and more importantly the reallocation of resources associated with those price increases, do not have the permanence of legislated price supports. Subsequent rounds of spending of the newly created money reflect not the policy objectives of the monetary authority, but the preferences of the income earners. Prices not initially affected by the monetary injection are eventually bid up, thus causing a reversal in the movement of resources. Apart from one consideration to be noted later in this section, the allocative effects of a monetary disturbance are necessarily self-reversing.[4]

One of the most common objections to this aspect of the Austrian theory concerns the movements and subsequent countermovements of resources. The initial quantity changes would simply not occur, so the objection goes, if subsequent changes in the opposite direction were anticipated. Although alternative treatments of expectations will be discussed in a subsequent section, it may be helpful at this point to deal in a general way with the problem of expectations in macroeconomic theorizing.

A business cycle anticipated, in the view of some macrotheorists, is a business cycle avoided. Employing the assumption of so-called rational expectations along with other essential assumptions, such as instantaneous market clearing and costless information, the New Classicists are able to transform the impermanence of money-induced distortions as seen by the Austrians into

the nonexistence of such distortions. The self-reversing process becomes a self-preventing process. The Austrian focus on the injection effects of monetary expansion (rather than the price-level effects) and on the market process set into motion by the monetary injections warns against adopting the New Classicist view. Several considerations are relevant.

First, conceiving of monetary expansion as a process involving sequential rounds of spending suggests that expectations, even if correct or rational, may not preclude the cyclical effects of monetary expansion. Whatever their particular expectations, individuals who receive the newly created money only in later rounds have less spending power than those involved in early rounds of spending. Although for any individual, the ability to spend is not strictly limited to the amount of money currently possessed, there are ultimate limits on the individual's ability to transform expectations into actions. Put bluntly, you can't spend expectations. While bank credit and trade credit can provide substantial leeway, spending is not *perfectly* elastic with respect to unborrowed money balances (Hayek [1978, p. 175]). Thus, individuals who correctly and rationally expect a large injection of newly created money are not necessarily in a position to act in full accordance with their views—however rational those views ultimately turn out to be.

Second and more important, individuals who are in possession of increased money balances and who have correct, or rational, expectations still may not spend in a pattern consistent with the New Classicist view. A spending pattern that is internally inconsistent on an economywide basis does not necessarily imply inconsistency for the individual. That is, macroeconomic irrationality does not imply individual irrationality. An individual can rationally choose to initiate or perpetuate a chain letter—sending one dollar to the person on the top of the list, adding his name to the bottom, and mailing the letter to a dozen other individuals—even though he knows that the pyramiding is ultimately unsustainable. Similarly, it is possible for the individual to profit by his participation in a market process that is—and is known by that individual to be—an ill-fated process. So long as it is possible to buy in and sell out before the process reverses itself, rational expectations may exacerbate rather than ameliorate the misallocation of resources induced by monetary expansion.

Third, apart from the relative-price changes that are reversed in a subsequent part of the process, there remains an effect that persists so long as the monetary authority continues to inject money in some particular way. (If this were the dominant effect, monetary distortions would be similar to legislated distortions and would lose their cyclical quality.) To illustrate with an extreme example, suppose that an aggressive and sustained monetary expansion is accomplished solely through the purchase of home mortgages. Can anyone doubt that the allocation of credit among borrowers and of resources among construction projects would be permanently affected? Hayek clearly recognized the permanence of this particular effect of monetary injection by using

the term *fluid equilibrium* (1978, p. 173). So long as the monetary authority maintains its spending level in real terms, which in view of the resulting inflation requires an exponentially increasing level of spending measured in nominal terms, the distortion remains.[5]

Considerations of a possible fluid equilibrium, of disparities between rationality as applied to the individual and as imputed to the economy, and of limits to the transformation of expectations into actions all warn against the New Classicist view. It is simply not true that full knowledge of a monetary expansion is tantamount to no expansion at all.[6]

Austrians are sometimes criticized for assuming static expectations—the clear implication being that the assumption of rational, or even adaptive, expectations is preferable. This criticism would have some validity if a change in the assumption about expectations—from static to adaptive to rational—were to nullify the theory or cause it to have categorically different implications. But such is not the case. The assumption of static expectations, when employed, serves as a heuristic device. The market forces that characterize a money-induced boom and the subsequent bust can be spelled out first in their simplest form. Amendments can then be made to account for complications that arise from other-than-static expectations. The assumption of adaptive expectations requires that the arguments be restated replacing monetary injections with rates of monetary injection and then with accelerations, surges, and so on as market participants continue to adapt. The assumption of rational expectations, in its most defensible form, requires that the basic truth in Lincoln's law (You can't fool all the people all of the time) be recognized—as it was recognized by Mises (1953, p. 319) long before the birth of New Classicism. The assumption of rational expectations in its least defensible form (You can't fool any of the people any of the time) is to be dismissed out of hand.

III. The Significance of Capital in Business-Cycle Theory

The self-reversing market process set into motion by monetary expansion, previously described in general terms, begins to take on a more specific character when spelled out in the context of some particular market. If the analysis is to retain its macroeconomic character—that is, if the self-reversal is to have economywide ramifications—then the focus must be on some broadly defined market such as the market for labor, the market for capital, or the even more broadly conceived market for productive factors. If, however, the market that serves as the focus of analysis is defined too broadly, such as the all-inclusive market for goods, then there can be no money-induced process of any significance and hence no reversal. In a theory where holding money and buying

undifferentiable goods are the only two alternatives, business cycles would be trivially portrayed—using Irving Fisher's imagery—as the "dance of the dollar." This is the fate of business-cycle theory, for instance, in the four-sector model devised by Patinkin [1965].

Capital in the Austrian Theory

That the Austrians singled out the market for capital goods as their focus for business-cycle analysis is to be accounted for by several considerations. First, it was largely the observed and widely acknowledged movements in capital-goods markets that initially motivated a theoretical explanation. Significantly, the various competing schools of thought—including the Austrians—used the terms *business cycle* and *industrial fluctuation* synonymously. The idleness of producers' goods used in heavy industry was perceived to be one of the most obvious and dramatic characteristics of economic downturns.[7]

Second, as a historical and institutional matter, monetary injections take the form of credit expansion. That is, newly created money is put into circulation through credit markets. In this respect too, the Austrian theory has a stronger empirical content than rival theories. The conventional assumption that newly created money is added directly to the cash balances of market participants serves to abstract from the market process highlighted by the Austrians. Increased real cash balances of all individuals mean an upward pressure on all prices. But in the Austrian formulation, the spending of newly created money does not impinge on all prices at once or in some random fashion; it impinges in the first instance on the interest rate, the price that clears the market for credit and governs the allocation of capital.

Monetary expansion temporarily alters the terms of trade between goods now and goods later. This money-induced alteration has its most direct effect within the market for capital goods. The capital goods themselves constitute current commitments, some more binding than others, to particular production processes. In general terms, a fall in the rate of interest stimulates the creation and use of capital goods that aid in the production of consumer goods in the relatively remote future at the expense of those that aid in the production of consumer goods in the relatively near future. But the movement of resources away from the production of lower-order capital goods and toward the production of higher-order capital goods is followed by a countermovement (Mises [1953, p. 363]). That is, the money-induced restructuring within the market for capital goods is eventually revealed to be inconsistent with intertemporal consumer demand and resource availabilities; the process is self-reversing.

Third, it is the temporal dimension of capital that gives scope and significance to the money-induced self-reversing process. The essential function of capital, pointed out early on by Jevons, is "to put an interval between the beginning and the end of enterprise" (1970, p. 226). This, in summary terms, is the

interval of time during which a misallocation of capital goods can occur and after which a reallocation must take place. Alternatively stated, it is the interval itself that is thrown out of equilibrium by credit conditions that are at odds with resource availabilities.

The economy's production process that spans the Jevonian interval consists of a number of separate stages of production. This vertical segregation, or temporal sequencing, comes into play in a way that is not always recognized. If all production processes were characterized by complete vertical integration—such that the commitment to initiate a process that will eventually result in the production of a consumer good is, in effect, a commitment to complete it—there would be little or no scope for a self-reversing process. Many of the arguments against the Austrian theory based on considerations of expectations would have greater plausibility. Entrepreneurs who anticipate the ultimate consequences of easy money—on the basis of either theoretical understanding or historical experience—would not be eager to participate in a money-induced boom. Those who continue to produce despite the monetary disturbance would compete with one another at the outset for lines of credit that would see their production process through to completion.[8]

Identifying the circumstances under which expectations would be potentially nullifying helps to explain why expectations are not actually nullifying in modern industrial economies. Neither chain letters nor money-induced production processes would be initiated if their initiators were bound to participate in every subsequent stage of the respective processes. The absence of complete vertical integration, however, can create significant opportunities for entrepreneurs to profit privately from one or more stages of a production process that, taken as a whole, will result in a social loss. And, as in the case of chain letters, those who make profits in the early stages may or may not hold expectations that reflect an understanding of the nature of the process; expectations, rational or otherwise, are in this context a subsidiary issue.

Still again, the Austrian theory has empirical content that is absent from rival theories. Primitive societies, whose members live a hand-to-mouth existence, do not experience business cycles as described by the Austrian theory; they have no capital structure that can become intertemporally discoordinated. Labor-intensive agricultural economies, whose intertemporal structure of production is determined more by the seasons than by credit conditions, are largely immune to the cyclical disturbances identified by the Austrians. Susceptibility to money-induced self-reversing market processes increases with the interval between the beginning and the end of enterprise and with the extent to which production processes are divided into temporally sequenced stages of production. These propositions conform with the broadly empirical observation that the boom-bust pattern to which the Austrian theory applies is characteristic of capital-intensive, market-oriented economies with a centrally directed monetary system.

That the Austrians were and continue to be the *only* school to focus on the market for capital when theorizing about business cycles is also understandable. They were the only school that had a well-developed capital theory. Menger (1950) identified the different orders of goods in accordance with their temporal sequence in the production process and drew attention to the intertemporal complementary that influenced the goods' value. Böhm-Bawerk (1959) dealt with the time element in terms of "roundaboutness" and demonstrated the inverse relationship between the rate of interest and the degree of roundaboutness that characterizes the economy's production process. Mises (1953) integrated monetary theory and value theory by developing Wicksell's distinction between the bank rate of interest and the so-called natural rate in the context of Böhm-Bawerk's capital theory. The Austrian theory of the business cycle was a natural outgrowth of these developments.[9]

Capital in Rival Theories

Rival theories either had no capital theory at all or had a capital theory that did not integrate well with monetary theory. In the 1930s, Keynes (1964, p. 176) rejected Böhm-Bawerk's theory out of hand—without providing a serious critique of it or even demonstrating that he understood just what that theory entailed. But with the Austrian theory jettisoned, Keynes did not attempt to offer an alternative. As was made clear in reference to his earlier theorizing, the attempt, instead, was to press on with the macroeconomic issues in the absence of capital theory (Keynes [1931, p. 394f.]).

After several decades of macroeconomics without capital, the Monetarists were able to expose many of the fallacies and shortcomings of Keynesian theory. But they were unable to identify those shortcomings that derive from the neglect of capital theory. Monetarism embraced a theory of capital and interest put forth by Frank Knight (e.g., 1934), who had engaged in a tedious and protracted debate with Hayek and other members of the Austrian school. Knight could make no sense of Jevons' interval or of Böhm-Bawerk's roundaboutness. Production and consumption, in the Knightian conception, are not temporally distinct activities. The only relevant distinction, according to Knight, is that between the economic flows of income or utility and the corresponding stocks into which such flows can be capitalized. But to conceive, as Knight did, of capital and interest as nothing but permanent stocks with automatic flows is to abstract from the intertemporal market processes that captured the attention of the Austrians and from the monetary disturbances that may interfere with those processes. Knightian capital theory, in the hands of the Monetarists, did not provide an alternative basis for integrating monetary theory and value theory; it provided, instead, a device for keeping the two theories segregated.

In recent years, New Classicism (Lucas [1981], Barro [1981]), with its emphasis on rational expectations, has become the most formidable rival to the

waning Keynesianism. While the theoretical constructions of the New Classicists differ in fundamental ways from those of the older Monetarists (Hoover [1984]), they share in the neglect of capital theory. These newer constructions highlight the temporal variation in macroeconomic magnitudes, yet the arguments hinge almost exclusively on *wage* rates and the intertemporal allocation of labor. *Interest* rates and the intertemporal allocation of capital are in no fundamental way a part of New Classicism. This incongruity dramatizes the resolve on the part of contemporary macroeconomists not to grapple with theories of capital and interest—even when intertemporal relationships are specifically at issue.

One encouraging development within the New Classical school, however, deserves mention. The assumption of rational expectations, coupled with assumptions of costless information and instantaneous market clearing, implies that a monetary disturbance should not have any systematic real effects beyond the period in which the disturbance occurs. Empirical studies, though, reveal a certain persistence of effects. Some New Classicists (Kydland and Prescott [1982]) attempt to account for this persistence by incorporating "time-to-build" considerations into an otherwise capital-free construction. That is, money-induced decisions to initiate a multiperiod production process affect in systematic ways the decisions to be made in subsequent periods. While time-to-build was added belatedly and only to resolve a disparity between theory and evidence, this development could lead to a reintroduction of capital theory into macroeconomics.

IV. In Lieu of Capital Theory

The Austrians focus on capital markets in their analysis of business cycles while rival schools do not. This much is easily established. But what sort of a macroeconomic construction remains when capital theory is subtracted from business-cycle theory? Answering this question for each of the rival schools helps to identify important differences among them. It also serves further to demonstrate and emphasize the crucial role of capital in the Austrian theory.

Keynesianism

Although Keynes had sympathy neither for Austrian capital theory nor for the Austrian theory of the business cycle, he did not offer alternative theories of his own. Ambitious as his *General Theory* was, it contained only "Sundry Observations on the Nature of Capital" and "Notes on the Trade Cycle," as announced by the titles of chapters 16 and 22. Now, more than half of a century after the book's initial appearance, Keynesian scholars are still debating whether or not the malfunctioning of capital markets is central to Keynesian

theory. The debate gets resolved as soon as a choice is made between focusing on what Keynes left out of his book and focusing on what he actually put in it. The consequences of each choice can be identified in summary terms.

There are no market mechanisms—at least none identified by Keynes—that can effectively allocate resources intertemporally. The rate of interest is determined by the supply and demand for money; the decision to invest is based, in large part, on the groundless expectations held by the business community, or on animal spirits, to use Keynes' own terminology. Not surprisingly, booms and busts occur with the waxing and waning of business confidence. When confidence is on the wane, the demand for labor falls, resulting in widespread unemployment. Wage rates either (1) will not fall because of unions or because of wage rigidities inherent in the market process, or (2) will fall but without making matters any better and possibly making matters worse because of the accompanying fall in the price level, or (3) should not be allowed to fall because of the considerations mentioned in (2).[10] Macroeconomic problems persist until some set of extramarket forces are designed to counteract the undirected and misdirected forces of the marketplace.

With this interpretation of Keynes, the absence of effective markets for capital goods, which derives by default from the absence of capital theory from Keynes' book, becomes the central focus (Garrison [1985]). If there are no coordinating mechanisms that, even in the best of circumstances, can effectively allocate resources intertemporally, then intertemporal markets will be discoordinated. The conclusion follows trivially. There remains nothing more for capital-oriented Keynesians to do, except for drawing analogies between market economies and kaleidoscopes (Shackle [1974]) or pondering—on the basis of a highly selective exegesis—about what Keynes must have had in the back of his mind (Leijonhufvud [1968]).

As an alternative interpretation, the fact that Keynes' *General Theory* contains no general theory of capital can be taken to imply that his theorizing is based on the assumption of a fixed capital stock and a fixed capital structure (Keynes [1964, pp. 40–45]). This assumption, stated symbolically in textbooks as $K = \overline{K}$, allows the focus of analysis to be shifted to other macroeconomic magnitudes, among which Keynes did posit some definite relationships. Consumption spending rises and falls with—but not as fast as—income: $C = a + bY$ where b is the marginal propensity to consume. This short-run consumption function, in which $a > 0$ and $0 < b < 1$, becomes the keystone of the theory. The remainder of the theory is specified in terms of interest elasticities: the demand for investment funds is interest-inelastic, and the demand for idle money balances is interest-elastic—both perfectly so in the limit.

Keyneisan multipliers, which are based on such propensities and elasticities, relate changes in employment to changes in investment spending. The same relationships hold, in this interpretation, whether the investment is undertaken by the business community or the government. The will to spend rather than

any more fundamental constraint, such as economic scarcity, is what limits the level of employment and hence national income. The intertemporal pattern of output is traced out as the unpredictable forces in the market for investment goods interact with the largely predictable forces in the market for consumer goods. (Coddington [1982] finds the significance of Keynesian theory in this interaction between the stable and the unstable sectors of a market economy.)

Most modern textbooks on macroeconomics consist of graphs and equations of such relationships gleaned from the *General Theory*'s treatment of money, interest, and employment, given the economy's capital stock. The issue of a changing capital stock is typically relegated to a separate chapter on economic growth, appended almost as an afterthought to the Keynesian chapters. This interpretation of Keynes has given rise to a distinction that stands in the way of reintroducing capital theory into macroeconomics. Macroeconomic theory is implicitly defined as all those relationships that can be identified among macroeconomic magnitudes on the assumption of a fixed capital stock. Theory involving a changing capital stock is, by definition, growth theory.

Writing three decades after the publication of the *General Theory,* John Hicks undertook a telling of the "Hayek story." He recalled the "time when the new theories of Hayek were the principal rival of the new theories of Keynes" (Hicks [1967, p. 203]) and then he justified his own alliance with Keynes on the basis of the modern definitional distinction. According to Hicks, we see in retrospect that Hayek's theories were not relevant to business cycles at all. Monetary disturbances—money masquerading as savings—could not cause the resource movements from consumer-goods industries to producer-goods industries as suggested by Hayek, because those movements involved actual changes in the capital structure. Actual changes in the capital structure can be brought about only by actual changes in the rate of savings. Hayek was theorizing not about business cycles but about economic growth. Not only had Keynesianism prevailed over Austrianism, it had numbed the ability of at least this one modern macroeconomist to think in terms of money-induced movements within the capital structure which constitute an artificial boom and lead—eventually but inevitably—to an economic bust.[11]

Monetarism

Monetarism has come to be closely identified with the quantity theory of money—so closely that it is sometimes defined narrowly in terms of the positive, virtually one-to-one relationship between the money supply and the general price level. "Inflation is always and everywhere a monetary phenomenon." The phraseology is uniquely Monetarist, but the idea itself has long been shared with the Austrians.

Attempts, even by the Monetarists themselves, to define this school of thought more broadly have been less than satisfying. At one stage of the debate beween the two schools, Friedman (1970) undertook to differentiate Monetarism from Keynesianism by reference to the Keynesian-based income-expenditure analysis. In this context, the key differences derive from differences in elasticities. For the Monetarists, the demand for money is interest-inelastic, the demand for investment funds is interest-elastic. If debate between the two schools resolved itself into such a simple empirical question, it could be settled in short order by consulting the data. If, alternatively, the differences in elasticities are simply a reflection of the short-run orientation of Keynesians and the long-run orientation of Monetarists, then Keynesian-based Monetarism is on weak grounds. The applicability of income-expenditure analysis is restricted by the assumption of a fixed capital stock—an assumption that can hold, if at all, only in the short run.[12]

A more general distinction between the two schools makes reference to underlying *beliefs* about the market system (Leijonhufvud [1981a, p. 297ff.]). Monetarists believe that markets work, that prices and wages are tolerably flexible, that individuals do not suffer from money illusion, and that market expectations will not for long be in conflict with reality. The perversities in the Keyenesian vision stem from disbelief on one or more of these counts.

The contrast of underlying beliefs is especially revealing when applied to a particular market, the market for capital goods. Both Keynesianism (interpreted as income-expenditure analysis) and Monetarism leave capital out of account—but for opposite reasons. For the Keynesians, markets for capital goods are so ill behaved (references in the *General Theory* to casinos and musical chairs are relevant here) that nothing much *can* be said about them; for the Monetarists, markets for capital goods are so well behaved (references to the Knightian vision of synchronous production and consumption are relevant here) that nothing much *need* be said about them. It is worth noting at this point that the Austrians occupy a middle-ground position (as they do on so many other substantive issues). (See Garrison [1982].) Equilibrating forces are at work in the market for capital goods, but they are particularly vulnerable to monetary disturbances. Because of the essential time dimension in the production process, a dimension whose relevance is trivialized by Keynes and denied by Knight, money-induced disequilibrium originating in the early stages of production can persist undetected until the production processes enter their final or near-final stages.[13]

Monetarists and Austrians do share a common ground, however, in that they each focus on a self-reversing process triggered by monetary expansion. But with the structure of capital outside their vision, the Monetarist analysis is focused almost exclusively on the market for labor (as in Friedman [1976]). The analysis of intertemporal distortions spelled out by the Austrians in terms of the various stages of production that make up the Hayekian triangle is supplanted by an analysis of labor-leisure distortions spelled out by the

Monetarists in terms of the short-run and long-run Phillips curve. The self-reversing nature of the process identified by the Monetarists and hence the analytical kinship to the Austrians, however, is clearly evident. Money-induced movements away from the natural rate of unemployment set into motion a market process in which changes in perceived wage rates and output prices eventually and inevitably reestablish the natural rate. (Material in the next few paragraphs is condensed from Bellante and Garrison [1988].)

The details of the self-reversing process as described by Monetarists differ categorically from those described by Austrians precisely because of the absence in the former of any disturbances within the structure of capital. A time-consuming production process thrown into intertemporal disequilibrium by a monetary injection is no part of Monetarism. Instead, the self-reversing process plays itself out within the market for labor and on the basis of differing perceptions of the effect that inflation has on the real wage rate. More specifically, northwestward movements along a short-run Phillips curve are produced by a labor market in which the worker believes the real wage rate (reckoned in terms of consumer purchasing power) has risen but in which the employer believes the real wage rate (reckoned in terms of the price of the firm's output) has fallen. The inevitable eastward shift of the short-run Phillips curve is brought about when both workers and employers eventually discover that the real wage rate has in fact not changed in either direction. In symmetrical fashion, deflation or even disinflation produces southeastward movements along a short-run Phillips curve followed eventually and inevitably by a westward shift of the curve.

The Monetarists' version of the self-reversing process is less than satisfying on several counts. First, why should injections of newly created money through credit markets, which affect, in a very direct way, interest rates and hence markets for capital goods, have effects of overriding importance on wage rates? Second, how plausible is an account that relies, in one inflationary episode after another, on chronic and systematic misperceptions of the real wage rate? (Note here that the temporally sequenced stages of production that make up the capital structure add a dimension to Austrian theory that has no direct counterpart in Monetarist theory.) And third, why should it take so long in any given inflationary episode for workers and employers to straighten out their misperceptions of the real wage rate?

In addition to lacking plausibility, the Monetarist account grossly understates the consequences of credit expansion. If growth in real output prevents the credit expansion from resulting in an increase in the general level of prices, then there are no misperceptions of wage rates and hence—in the Monetarists' view—there is no money-induced self-reversing process. Further, if the account is confined to unskilled labor, then the misallocations would be short-lived and easily corrected. Any actual welfare loss would manifest itself as a lament on the part of workers that they had consumed either too much or too little leisure as a result of the monetary disturbance. If, alternatively, the misallocation of skilled labor is to be taken into consideration, then the focus is shifted to human capital and

the Austrian analysis comes into play. The time-consuming development of specific skills and the development of skills complementary to specific long-term production processes are features of a theory that involves an intertemporal structure of both human and nonhuman capital.[14]

New Classicism

A brief stock taking at this point will help to put post-Monetarist developments into perspective. Keynesian theory in all its interpretations makes a first-order distinction between markets for consumer goods, which always perform appropriately in accordance with the fundamentals of supply and demand, and markets for investment goods, which never—or only by accident—perform appropriately. The economy's output as well as the employment of labor in all interpretations of the theory varies in direct proportion to the spending on (private and public) investment goods.

Monetarism, interpreted as Phillips-curve analysis, makes a first-order distinction between capital markets, in which nonhuman resources are allocated efficiently, and labor markets, in which inflation-induced misperceptions of the wage rate can cause temporary but systematic misallocations. The economy's total output in this analysis varies in direct proportion to the employment of labor.

There is no comparable first-order distinction in New Classicism between markets that work right and markets that go wrong. As a first—and sometimes last—approximation, all markets allocate resources efficiently. In the early and hard-drawn expositions of New Classicism, the assumption of rational expectations implied trivially that all markets are governed, in the short run as well as the long run, by the fundamentals of supply and demand. Stabilization policy as might be conceived and implemented by the monetary authority is both ineffective and unnecessary. Thus, rational expectations in its early applications to macroeconomics did not constitute an alternative to Keynesianism and Monetarism; it simply denied the phenomenon (cyclical unemployment) that the Keynesians and the Monetarists were attempting to explain.

To allow the subject matter back into the analysis of it, the New Classicists had to invent a distinction that could drive a wedge between some actual price or quantity and the corresponding equilibrium price or quantity. The distinction that now dominates in models employing the assumption of rational expectations is that between local knowledge and global knowledge (Phelps [1970], Barro [1976]). A system of island economies is conceived in which prices can be affected both by changing supply and demand conditions in each local economy and by money-supply shocks that have consequences on a global scale. Immediate knowledge about nominal price changes coupled with belated knowledge about money-supply changes gives scope for real prices to deviate temporarily from their equilibrium levels. Monetary disturbances, in this construction, can affect the level of output in the local economy to the extent that nominal price changes are mistaken for real price changes.

The critical role of knowledge—of two kinds of knowledge—allows for an interesting comparison between New Classicism and Austrianism. The New Classicists' objective, often stated with unabashed pride, is to theorize about the economy without recourse to the sort of ad hoc assumptions that characterize other schools of thought. (See e.g., Klamer's conversations with Lucas and Sargent [1983].) Their conclusions do not turn on some supposed rigidity or inflexibility of prices or wages, on some expectational scheme that is at odds with the theory that incorporates it, or on some supposed failure of market participants to take advantage of the knowledge they possess.

The assumption that there is a first-order distinction between knowledge of movements in the money supply and knowledge of other economic magnitudes, however, is just such an ad hoc assumption. What are the relevant constraints and objective functions that determine the length of this lag? Is the lag constant over time? And why should this particular lag in the acquisition of knowledge have significance that overshadows all others—including the one that characterizes the Monetarists' Phillips-curve analysis? While these questions remain unanswered by the New Classicists, their models must incorporate this or some similar knowledge lag in order to avoid absurd or trivial conclusions—that money does not matter or that money does not matter if market participants base their actions on real factors only.

The Austrians, too, employ a knowledge-based distinction, but not one that requires island economies or any other such fictitious construction. Long before the economics of knowledge was an object of attention, Hayek (1948) made a first-order distinction between two kinds of knowledge. Theoretical knowledge about how the economic system works must be treated differently from knowledge of the particular circumstances of time and place. This distinction does not represent an ad hoc assumption, but rather reflects important insights of the earliest political economists. The message conveyed by Adam Smith's "invisible hand" is that the economic system works without the market participants knowing—or caring—just how. Referring either in general to the structure of the economy or in particular to the intertemporal structure of production that serves as a basis for the Austrian theory of the business cycle, the two kinds of knowledge can be identified as knowledge *of* the structure and knowledge *within* the structure. Alternatively, the distinction is between theoretical knowledge and entrepreneurial knowledge. (For a discussion of the relationship between these two kinds of knowledge and the extent of the overlap, see Garrison [1986, p. 444f.].)

Market participants possess enough entrepreneurial knowledge to make the economy work, but they possess little or no theoretical knowledge. The play-off between knowledge *within* and knowledge *of* the structure has the same analytical significance for the Austrian formulation as the play-off between local and global information has for the New Classical formulation. In both, the distinction between two kinds of knowledge allows for the derivations of results

that conform in some degree to real-world observations. But for the Austrians, the distinction is not just an abstract modeling device; it is a recognition of one of the most fundamental features of real-world market economies.

The full dependence in the rational-expectations models on the time lag between the acquisition of global information relative to local information can be demonstrated by considering the economic structure typically envisioned by the New Classicists (e.g., Barro [1976]). In effect, there is only one commodity being supplied and demanded. The commodity is conceived to be nondurable in the extreme—a service indistinguishable from the corresponding labor that renders it. This construction avoids dealing with any kind of a production *process* or even with a choice between consuming a good now or storing it for later consumption. Also, demanders on any particular island possess the same information as suppliers. This assumption insures that the only information difference that matters is the one between global and local information.

At this point we may legitimately wonder why there would be any trade on such an island? What keeps each individual from consuming his own labor services? There must be something in the nature of the service such that one individual must render it to another. Though several possibilities come to mind, Barro (1976, p. 83) has suggested that we think in terms of "back-scratching services." Trade actually does take place. Still, there is room for more legitimate wondering. What need would such an economy have for a medium of exchange? The usually troubling double coincidence of wants is no coincidence at all: "I'll scratch your back; you scratch mine." At most, money would serve as an accounting device used to keep track of the indebtedness of scratchees to scratchers.

The objective of such primitive models in which individuals live a hand-to-back existence is to facilitate the investigation of the consequences of a monetary injection. And as is conventional in such formulations, it is assumed that the injection takes the form of transfer payments—thus avoiding any interest-rate effects that might occur in a credit expansion. The only possible consequence, then, is that the price of back-scratching services is bid up. The key concern is with how individuals divide their time over the next several periods between rendering the service and consuming leisure as they guess about the cause of the price increase and eventually learn that it is attributable to a monetary shock and not to a change in some real factor (e.g., an increase in itching). Again, there are grounds for wondering. What relevance could an answer to such a question possibly have for understanding the causes of industrial fluctuations in modern, market-oriented, capital-intensive economies?

In the face of such wondering and implied criticism, rational expectations and island economies are defended not as having direct relevance or as highlighting aspects of the market process that are actually crucial in real-world business cycles; they are defended instead simply as modeling techniques for building analogue economies. If some model, by which is meant a "fully articulated

artificial economy," turns out to generate time patterns of unemployment and output that mimic to a first approximation the actual time series for those magnitudes, then we have attained—by virtue of being able to construct such a model—an understanding of those patterns (Lucas [1981, p. 219]). Though the link between building such economic models and understanding actual economics is often implied and sometimes asserted, the methodological reasoning that establishes the link is, to my knowledge, never revealed.[15]

New Classicism might more palatably be defended by an appeal to instrumentalist methodology. The models themselves provide no understanding, but they can be instrumental in our deciding what correlations and time patterns to look for in the macroeconomic data. By construction, however, the models fail to suggest that business cycles may have something to do with the capital structure as affected by movements in the interest rates.

While New Classicists often claim some affinity to the Austrian school, they reject the Austrian theory of the business cycle strictly on empirical grounds. The magnitude of the alleged cause (cyclical changes in the interest rate) is so small compared to the magnitude of the alleged effect (a crisis in the market for investment goods) that the Austrian theory cannot seriously be entertained (Lucas [1981, p. 237]). It is tempting simply to ignore this criticism of the Austrian theory, pointing out that by similar logic a careless smoker could not possibly cause a forest fire. But because the empirical significance of interest-rate effects is so often in question, a more serious and considered response may be in order.

First, a cyclical pattern in observed interest rates is not essential to the Austrian theory. A money-induced deviation of the loan rate from the natural rate is the exogenous triggering device. Further, central-bank policy that maintains constancy in the easily observed loan rate under conditions in which the not-so-easily observed natural rate has risen can initiate the self-reversing process within the market for capital goods as identified by Austrian theorists.

Second, the effects of an artificially low interest rate are not so much *over*investment as *mal*investment. While the low rate does generally favor investment over consumption, the validity of the Austrian theory does not hinge on the magnitude of this effect in aggregate terms. Low interest also favors particular kinds of investment over others. It favors more durable over less durable capital goods as well as capital goods used in more roundabout rather than less roundabout production processes. These are the effects that are overlooked by simple calculations showing that the demand for investment funds is interest-inelastic.[16]

Third, the crisis manifests itself as intertemporal discoordination that requires a systematic reallocation of capital within the structure of production. Because of the number of relatively long-term production projects undertaken, resource availabilities are not quite sufficient to carry them through. That they are merely not *quite* sufficient is what allows the artificial boom to be sustained

over a considerable period without its artificiality being apparent. But that they are *not* sufficient is what makes an eventual restructuring inevitable. The realization that the sustainability of production processes on an economywide basis may be threatened by small but prolonged distortion of the interest rate away from its natural level confers plausibility on the Austrian theory of the business cycle.

New Classicism, Monetarism, and Keynesianism each deal in some indirect way with the intertemporal allocation of resources. Even a casual survey reveals, however, that descriptions and discussions of market mechanisms supposedly relevant are, in lieu of a capital theory, contrived. Only by basing such discussions on some coherent theory of capital is it possible to deal in a direct way with the market mechanisms that, potentially, can achieve intertemporal coordination and with policies that may result in intertemporal discoordination.

V. A Summary View

The Austrian theory of the business cycle stands up well to criticism. The integration of monetary theory with a rich theory of capital involving temporally sequenced stages of production coordinated intertemporally by market mechanisms provides a theoretically sound and historically relevant basis for an understanding of the problem of business cycles. Attention to capital theory gives the Austrians a decided advantage over other schools in theorizing about cyclical movements in macroeconomic magnitudes—or more generally, about self-reversing intertemporal market processes.

And as it turns out, the attention to—or neglect of—capital theory serves as well as a peg on which to hang some history of economic thought. Fuller understandings of New Classicism, Monetarism, and different renditions of Keynesianism are made possible by noting how they did or why they did not take capital into account. Except in Keynesian theory, which lacks the very coordinating mechanisms that the Austrians have for so long illuminated, intertemporal coordination gets achieved, however well or badly, in some market process. If the coordinating mechanism does not take the form of an interest rate that determines the intertemporal allocation of capital, then it must take some other form—correctly or incorrectly interpreted price changes that cause individuals to store money or make some adjustment in their consumption behavior; perceived or possibly misperceived wage rates that allocate the employment of labor over time; or investment activities that are governed by the waxing and waning of business confidence.

Austrians are often criticized for placing too much emphasis on or according too much importance to their business-cycle theory. Why all the attention to nineteenth-century business cycles or to the Great Depression, which in so many respects was a unique historic event? While the Austrian theory does have

a direct applicability to these historical episodes, it has broader significance as well. Austrian capital theory amounts to a theory of intertemporal coordination; Austrian business-cycle theory (that is, the analysis of the effects of an exogenous monetary expansion in the light of Austrian capital theory) amounts to a theory of intertemporal discoordination. And even more broadly, calling attention to the Austrian theory of the business cycle constitutes an appeal to the economics profession to put capital theory back into macroeconomics.

Notes

1. The concept of involuntary unemployment, for instance, is found to be meaningless in the context of New Classicism and its equilibrium models of the business cycle. "In these models the concepts of excess demands and supplies play no observational role and are identified with no observed magnitude" (Lucas [1981, p. 287]). For a critical survey of this and similar aspects of New Classicism, see Yeager (1986, pp. 382–86) and Leijonhufvud (1986, pp. 418–19).

2. Although Rothbard has written extensively on the Austrian theory of the business cycle, Tullock's critique draws exclusively from "Economic Depressions: Their Cause and Cure," most readily accessible in Mises et al. (1983). Tullock references the original publication by Constitutional Alliance, Inc., which he reports as having no publication date. My copy is dated 1969.

3. Leijonhufvud's analysis highlights disturbances and adjustments and downplays the point that the disturbance of the economy from its natural growth path may be either in the positive or the negative direction. If we were to focus on this positive/negative distinction and to divide the adjustment process into an initial phase and a final phase, we could categorize Leijonhufvud's cycles as X/N or N/X. The first category would include a positive disturbance caused, say, by an increase in the money supply, which is eventually rectified as prices are adjusted upward to accommodate a higher level of nominal cash balances; the second category would include a negative disturbance caused, say, by an increase in money demand, which is eventually rectified as prices are adjusted downward so as to produce a higher level of real cash balances.

4. Tullock sees monetary stimulation as analogous to the stimulation of agriculture brought about by USDA programs and to the stimulation of industry as might be brought about by a system of taxes and subsidies. The analogies fail, however, because of the absence in USDA programs and tax/subsidy schemes of any self-reversal. "Suppose that the government taxed consumer goods and used the money to subsidize investment. Suppose further that after a while it stopped the subsidy" (Tullock [1987, p. 77]). The "Suppose . . ." followed by "Suppose further . . ." is a characteristic of disturbances in the X/X category. Hence, distortions caused by such a sequence of fiscal policies are categorically different from distortions caused by monetary stimulation.

5. In defending his own account of the boom-bust sequence against a challenge by John Hicks, Hayek (1978) drew attention to the first and third considerations spelled out here, the first in terms of the absence of perfectly competitive conditions in the

market for lonable funds and the third in terms of "fluid equilibria." Though responsive to Hicks, whose objections were based on comparative-statics analysis, Hayek overlooked the potentially exacerbating effects of rational expectations that are revealed by comparing the dynamics of the production process to the dynamics of a chain letter.

6. As an alternative illustration of all three considerations, note that when the government discovers a counterfeiting ring, it immediately shuts it down. Does the New Classicist view imply that accurate and timely publication of the total money supply inclusive of the ring's contribution would be an equally effective policy?

7. It is ironic, in view of these empirical roots, that the Austrians are so often accused of having no empirical foundation for their business-cycle theory. What is true is that the Austrians have always rejected the modern positivists' strategy of fabricating wholly abstract models and then mining the available statistical data to determine whether such models may be related in any way to real-world events. For the Austrians, history (which includes but is not limited to statistical data) and theory (which helps to make history intelligible) are complementary disciplines (Mises [1969]).

8. Though concerned with chronic resource idleness rather than with an unsustainable boom, Keynes lamented the loss of commitment brought about by the emergence of organized capital markets. "The spectacle of modern investment markets has sometimes moved me towards the conclusion that to make the purchase of an investment permanent and indissoluble, like marriage, except by reason of death or other grave causes, might be a useful remedy for our contemporary evils" (1964, p. 160).

9. Tullock (1987, p. 78, footnote 8) objects to Rothbard's account of the business cycle on the grounds that roundaboutness in investment occurs in the depreciation of plant and equipment rather than in some more narrowly conceived production process. As an empirical matter, this claim may well be correct. In the earliest modeling attempt by Hayek (1967), the focus was confined to a continuous-input/point-output production process. This construction allowed the highlighting of the time element in the production process without involving the complications of durable capital. Applications of the theory, of course, require that the time element in all its manifestations be taken into account. Tullock is suggesting, in effect, that a model involving depreciating capital goods would be more realistic and hence more directly applicable to actual production processes.

Tullock's claim (p. 76) that "the producer goods industries are always a fairly small part of the economy" is puzzling. Surely, industrial economies are to be distinguished from primitive economies in terms of the size—fairly large and fairly small, respectively—of their producer-goods industries. In any case, the problem of intertemporal coordination can be incorporated into economic theory by distinguishing between relatively more time-consuming and relatively less time-consuming production processes.

10. Keynes appears to be adopting a strategy usually confined to the legal profession: "My client didn't borrow your urn; it was in perfect condition when he returned it; and it was already broken when you lent it to him." Keynes was "arguing like a lawyer" that the profession's attention should be directed away from wage rates and toward interest rates. This view of Keynes is consistent with Leijonhufvud's (1968).

11. An alternative interpretation is that opponents of the Austrian view have pursued, in effect, a divide-and-conquer strategy: sort out that part of the Austrian theory that looks like fixed-capital macroeconomics and pit it against Keynesian theory; sort out that part that looks like the economics of capital accumulation and pit it against

neoclassical growth theory. Neither part fares well on its own. The key to the divide-and-conquer strategy is the working hypothesis that capital is homogeneous. Lachmann identified this battleground and recognized the significance of the battle more than thirty years ago:

> Once the homogeneity postulate has been abandoned the distinction between growth and fluctuations loses its meaning. The distinction finds a place in a theory which confines itself to asking whether and to what extent existing resources are being used, whether, and perhaps at what speed, such resources can be augmented, and what are the circumstances in which such augmentation is likely to take place. Once we have learnt how to ask how, and in what order, existing resources are being used, and what are the implications of such multiple use, once we have begun to understand the importance of the concrete form of resources in limiting the scope of multiple use, we can easily dispense with the all too simple distinction between economic growth and cyclical fluctuations. (Lachmann [1978, p. 112]).

12. Leijonhufvud (1981b, p. 140ff.) rejects the elasticity-based distinction between Keynesianism and Monetarism: demands for liquid assets and for investment funds are not *always* characterized by some particular elasticity. Each is sometimes elastic, sometimes inelastic—depending on the state of expectations and the circumstances created by the particular policy regime. From an Austrian viewpoint, Leijonhufvud can be faulted only for a sin of omission. Is it not more instructive to call attention first to the intertemporal structure of capital, which is ignored by both the Keynesians and the Monetarists, and then to expectations and policies that influence the allocation of resources within that structure?

13. Some Keynesian scholars will undoubtedly object to the claim that Keynes trivialized the time dimension of the production process. Yet in his discussion of the nature of capital, he suggested that a given process has all sorts of attributes—which include "smelliness" as well as "roundaboutness." No single such attribute, according to Keynes (1964, p. 215), has any special claim on our attention. Keynes's deep-felt concern about "the dark forces of time and ignorance that envelop our future" (p. 155) is expressed several chapters earlier in a discussion of long-term expectations. The order of the two discussions is revealing: Keynes deals with expectations about long-term rates of profit without having brought into view the proximate objects of those expectations—the capital goods that give concreteness to the structure of production.

14. The social losses attributable to monetary disruptions are not at all accurately measured by unemployed labor (Wagner [1979]). Some distortions of the capital structure may involve no unemployed labor at all. Conversely, labor employed to undo such distortions can hardly be counted—in a broader context—as social gains. Tullock's claim (1987, p. 77) that money-induced distortions of the capital structure should, according to his understanding of the Austrian theory, give rise to *higher* living standards simply ignores the intertemporal discoordination identified by the Austrians. It is true that if we reinterpret the theory in the context of a Knightian stock-flow conception of capital, then we can argue that monetary expansion forces individuals to forgo part of the consumption flow in order to add to the capital stock, after which the flow is permanently higher. But such an intertemporal distortion of the flow of output cannot, on the whole, be considered welfare-enhancing.

15. Assertions by Lucas (1981, p. 219) are explicit:

> One exhibits understanding of business cycles by constructing a *model* in the most literal sense: a fully articulated artificial economy which behaves through time so as to imitate closely the time series behavior of actual economies. The Keynesian macroeconomic

models were the first to attain this level of explicitness and empirical accuracy; by doing so, they altered the meaning of the term *theory* to such an extent that the older business cycle theories could not really be viewed as "theories" at all.

16. Leijonhufvud (1986, p. 417), who claims to have been overexposed to the Austrian theory, rejects that theory on the basis of such simple calculations involving high levels of aggregation: "My trouble with ABC [Austrian business-cycle theory] is that its . . . falsifiable content has been falsified. According to ABC, inflation should produce an overinvestment boom. The stagnation decade of the 1970s does not fit: it gave us inflation but no acceleration of capital accumulation." But see Leijonhufvud (1976) for a more thoughtful discussion of the relationship between theory and evidence.

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