Capital-Based Macroeconomics: Recent Developments and Extensions of Austrian Business Cycle Theory

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The business cycle theory of Hayek and the macroeconomic models of John Maynard Keynes were the two major rivals in the 1930s. From the 1940s to the late 1970s, however, the framework developed by Keynes in *The General Theory of Employment, Interest, and Money* dominated economic policy and pedagogy, despite logical and theoretical problems with the model. Much of the success of the Keynesian approach within the profession was due to the follow-up developments by Sir John Hicks (1967b) and Paul Samuelson (1948). These economists developed simple graphical presentations (the IS-LM model and the Keynesian Cross) that made it easy for economists to grasp the implications of the theory, to extend and develop the theory, and to use the theory for historical analysis and policy applications. Most important, the simplifications provided a pedagogy for teaching the Keynesian model to new students of economics.

Hayek's business cycle model—which was partially responsible for his winning the Nobel Prize in economics in 1974—was temporarily abandoned, not because it was wrong, but partly because, as Hicks (1967c, p. 204) has argued, while the writings of Hayek and Mises on business cycle theory were in English, they were not English economics, and partly because the model was too complex. The current neglect or downplaying of Austrian insights by mainstream economists can be attributed to similar factors, most recently expressed by Yeager (1997) and Wagner (1999). The inability to effectively communicate Austrian insights is compounded by the fact that publication of papers with Austrian or capital-based macroeconomic themes have, in general,

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been limited to special volumes, such as Keizer et al. (1997); to journals devoted to the history of economic thought, such as Garrison (1985) and Cochran and Glahe (1994) in *History of Political Economy*; to journals published by think tanks, such as, *Cato Journal* (Garrison 1986, 1992) and *Independent Review* (Garrison 1999; Hülsmann 2000; or Selgin 2000); or to multidisciplinary journals such as *Critical Review* (Garrison 1994).[1] Recent developments in Austrian business cycle theory have been greatly accelerated by publishing opportunities opened up in newer journals devoted to the advancement of Austrian economics, particularly the *Review of Austrian Economics,* and more recently the *Quarterly Journal of Austrian Economics.*

Despite these recent advances and clarifications, the Mises-Hayek model has, however, had no equivalent model or framework to compare to the IS-LM or Keynesian Cross framework. Hayek's attempt to further develop his more complex theory resulted in the publication of *The Pure Theory of Capital.* This book is over 500 pages long and was only a preliminary for "further investigations of the dynamic phenomena of business cycles" (1975, back cover). Hayek never completed a promised second volume of at least equal length to fully develop his model. The great complexity of the capital and monetary issues has caused many others who have attempted the project to also abandon it.

Professor Garrison's *Time and Money* fills in the gaps. In the book, Garrison finishes Hayek's project, not by trying to make the model as complex as issues of time and money might suggest, but by combining a simpler model, the "intertemporal structure of production," with two standard principles-level models—the production possibilities frontier and the loanable funds market—to develop a comprehensive framework for exploring the operations of an economy in time.

One of Professor Garrison's key developments is his capital-based macroeconomics model which he uses to address the fundamental question facing macroeconomic policymakers today: Can economic growth be maintained? If so, how? If not, why not? Such questions have been of interest to economists since the early developments of classical economics, as evidenced by the title of Smith's great work, *An Inquiry Into the Nature and Causes of the Wealth of Nations.* In a capital-based macroeconomics, sustainable growth occurs because investment exceeds depreciation and all investment is financed by available saving (pp. 63-67). Growth is sustainable because it is consistent with tastes and preferences and resources availability. Regardless of its actual rate, such growth should be of no concern to monetary policymakers, particularly those concerned with accelerating inflation. Sustainable growth in a sound money environment or under a policy regime following a productivity

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[1]For a symposium on publishing in Austrian economics, see the *Quarterly Journal of Austrian Economics* volumes 1, 2, and 3 (2000).

norm should be accompanied by declining prices. In the Garrison model, sustainable growth is represented by a continuous outward shift of the production possibility frontier (PPF) and a loanable funds market in equilibrium. In the equilibrium business cycle literature, such growth is often referred to as balanced growth (output, investment, and consumption all growing at the same rate).

Growth becomes unsustainable when it is not consistent with underlying tastes and preferences and resource availability. As such, it must be policy-induced, not preference-induced growth. While Garrison (p. 76) presents three possible scenarios—a transfer expansion, a credit and transfer or neutral expansion, and a credit expansion—the most relevant is the credit expansion. The credit expansion is the familiar Mises-Hayek Austrian business cycle theory. If the economy is at full employment when a credit expansion begins, unsustainable growth occurs as the economy begins to produce outside its PPF and the mix of output shifts toward investment without a corresponding change in time preference. The same phenomenon could occur during a recovery (a movement from inside the PPF to a point on the frontier) if, because of credit creation, the investment-consumption balance is not consistent with underlying time preferences. The capital-based macro model explains the interactions between money, credit, and investment that set up conditions for unsustainable growth, as illustrated by what I refer to as "dueling production structures" (Fig. 4.4, p. 69). Consumer's preferences are pulling resources into a shorter structure of production, while the credit expansion is attempting to attract resources to support an alternative longer production structure. The resource base is not sufficient to allow completion of both structures simultaneously.

Garrison shows that the capital-based macroeconomic model is, thus, well-suited to bridge the gap between the short run and the long run. The model can explain seamlessly the long-run growth trend (and changes in the trend), fluctuations around the trend (cycle phenomena), and the associated greater variability in investment relative to total output and consumption that is consistently picked up in economic data series. In addition, the capital-based approach of the Austrian theory avoids the empirical irregularities associated with the movements in the real wage over the business cycle that haunt the labor-based approach of Friedman; it also can explain why demand-side policy shocks, even during periods of recession and recovery, are destabilizing (Mises 1998, pp. 576 and 792).[2]

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[2]Vedder and Gallaway (2000) provide empirical evidence that, historically, counter-cyclical policy has in fact been destabilizing. Hayek (1975) also shows theoretically why a monetary expansion that begins not at full employment but during a recession, leads to a cycle.

Garrison's exercises in comparative frameworks are also quite illuminating with regard to other current policy concerns. Are recessions the result of excessive central bank tightening—a pluck as illustrated by using a stylized form of the Friedman (1993, Fig. 1, p. 174) plucking model? The usual interpretation of U.S. growth data in a plucking model is that "U.S. data on real output show an important 'ceiling' effect; growth rates are on average below the ceiling rate, but tend back to the ceiling rate" (Goodwin and Sweeney 1993, p. 178). Why does such a pattern appear in the data? While a monetarist-monetary disequilibrium model can be used to explain the observed business cycle phenomena, the Austrian model can also provide a plausible explanation of the observed pattern as developed by Garrison (2001, pp. 220–24).[3]

In the monetarist model, *natural* full-employment growth is interrupted by monetary disequilibrium, and the "money string is plucked downward" (Friedman 1993, p. 173). These plucks are interpreted as random policy errors that decrease the supply of money or fail to increase it in response to an increased demand for money. The resulting excess demand for money, coupled with price rigidity, triggers a recession followed by a subsequent recovery that may or may not be aided by an expansionary policy.

In the Austrian model, the problem develops as an investment boom. As previously argued, investment generated by savings is sustainable, while investment generated by credit creation is not.

> The boom for the Austrians refers to something going on largely within the output aggregate. It is represented in Friedman's plucking model not by a conspicuous recovery to trend but rather by some period preceding a pluck which Friedman, operating at a higher level of aggregation, presumes to be healthy growth. (Garrison 1996, p. 800)

The credit-induced part of the boom or recovery, however, is malinvestment and not sustainable growth (pp. 224–29).

Garrison reemphasizes that the self-reversing effects of a money-credit injection exist even if the monetary increase occurs when unemployed resources already exist. The final outcome of the process may be delayed, but it does not change. An increased supply of money credit granted to entrepreneurs will initially stimulate investment relative to consumption (and in excess of investment levels consistent with underlying time preference). If there are available stocks of all resources—including consumer goods, as often may be the case when an economy is inside its production possibility frontier—the idle resources may be absorbed temporally, and the process may continue

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[3]While the Austrian model can be adapted to this interpretation of the data, fluctuations below a growth ceiling, the Austrian cycle is more consistent with fluctuations above and below a sustainable trend line (Garrison 2001, pp. 247–50).

unimpeded for some time. Costs need not rise since newly employed resources do not have to be bid away from alternative uses. The increased money incomes of input owners need not cause the price of consumer goods to increase if the additional consumer goods can be supplied from stocks. The Keynesian multiplier process may reasonably describe the initial phases of such a recovery. This multiplier process, however, essentially describes a process where no real scarcities exist, an "economics of abundance" (Hayek 1941, pp. 369–74). But when scarcities reassert themselves, bottlenecks develop. The crisis will again be upon the economy. While the downturn may appear to be the result of a pluck (a central bank- or banking sector-induced restriction in credit availability), more careful analysis makes it clear that a "policy-induced boom contains the seeds of its own undoing" (Garrison 1996, p. 800).

Garrison's analysis can be extended to a criticism of real business cycle theory. The empirical results presented in the real business cycle literature can be used as an exercise in "interpretive economic history" (Higgs 1995) to illustrate the relevance of Austrian business cycle theory. Real business cycle theorists see the pattern of expansion and contraction present in economic data as the economy's response to exogenous productivity shocks. These "modern theories of business cycles attribute cyclical fluctuations to cumulative shocks and disturbances that continually buffet the economy. In other words, without shocks there are no cycles" (Chatterjee 2000, p. 1). Money and central bank policy are largely irrelevant with respect to economic expansions and downturns. But, while policy errors do not cause downturns, countercyclical policies are counterproductive; they entail costs in excess of benefits (Prescott 1986, p. 21; Chatterjee 1999, p. 18).

The real business cycle model regards fluctuations in factor productivity as the major source of fluctuations in economic activity. These fluctuations in total factor productivity, "the effectiveness with which workers and machinery generate value-added" (Chatterjee 1999, p. 19), are usually identified with the "Solow residual." The Solow residual is developed by modeling an economy with competitive markets and constant returns to scale, using an aggregate production function of the form $Q = Af(K,N)$, where A, the Solow residual, is a shift parameter representing exogenous technical progress or a productivity shock, K is a measure of the capital stock, and N is a measure of labor input (Lewin 1999, p. 76).[4] Proponents conclude that the model can account for

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[4]The model can also be presented in growth terms as is done by Stadler (1994, p. 1752), $q = \alpha n = (1-\alpha)k + z$, where q is the growth rate of output, n is the growth rate of the labor supply, k is the growth rate of the capital stock, and z is "growth that cannot be accounted for by growth in labor or capital, . . . multi-factor productivity growth . . . that has been dubbed the 'Solow residual'."

about 70 percent of the postwar business cycle phenomenon (Kyland and Prescott 1991). But critics contend there is "no independent corroborating evidence for the large technology shocks that are assumed to drive business cycles" (Stadler 1994, p. 1751).

While one should not deny that fluctuations in key aggregates may be the result of agents' responses to exogenous shocks, one should expect historical studies would be able to identify the shocks. A capital-based macroeconomic model provides some possible answers. What is identified as a technology shock in the highly aggregated production function model may be better modeled in an Austrian capital framework as a change in the structure of production. The explanation relies on a lower level of aggregation (pp. 224–29). If the above specified production function is incomplete, if it fails to identify all relevant inputs, then the shift factor A picks up the effects of the unidentified or omitted inputs. "Identifying and talking about them renders them "endogenous" (Lewin 1999, p. 76). Clearly, from an Austrian perspective, such a production function is incomplete. If capital is viewed as a structure, there is at any point in time not just one technology known by all and used by all, but a multiple of technologies either in use or available for use. Time preference and available saving limits not only the amount of investment, but also the type of capital goods and technologies invested in.[5] With high time preferences and limited saving, investments are, in general, production plans to meet more immediate needs. Investment projects are shorter, less labor-saving, and less durable. The complex combination of resources that makes up the structure of production is less productive. With lower time preferences, production plans provide for greater future provision. Investment projects are, on average, longer, more labor-saving, and more durable. In broad aggregate measures the results of such investment choices should show up as increased total factor productivity, the "shock factor" in the real business cycle literature.

At a lower level of aggregation, what looks like an economy's response to a "positive technology" shock may be in fact an economy's response to credit creation. The productivity increase is, in reality, endogenous. Or it could be a combined response; the economy is subjected to a truly exogenous productivity shock in new knowledge or improved production techniques. The greater potential productivity of new investment projects of all types increases the demand for credit, but the higher demand for credit is partially accommodated by credit creation. In either case, the economy-wide response will be a combination of sustainable and unsustainable growth. Part of the expansion

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[5]Lewin (1999), Lachmann (1956), and Cochran and Glahe (1999, pp. 107–10) provide more in-depth discussions. The Austrian framework also makes clear the strong link between investment and technological change. New knowledge cannot affect production until there is investment in new capital goods that make use of the new knowledge.

of investment during the response period will be malinvestment. As the mal-investments are discovered and corrected, the production structure will short-en, productivity will decline, and the aggregate data picks up a negative productivity shock. The money and credit creation during the expansion, rather than being a harmless endogenous response of banks to changing market conditions, sets the stage for the boom-bust pattern of the cycle.

Garrison (2001, pp. 1–5) argues that a key feature of capital-based macroeconomics is that it provides the macroeconomics of the medium run. The Austrian theories of capital and credit creation theoretically separate sustainable from unsustainable growth. The long run is the series of short-run adjustments. The Austrian model thus provides a single model of the short run, the medium run, and the long run. While business cycle phenomena may be caused by exogenous shocks or inappropriately tight monetary policy, much of the actual cyclical activity is best interpreted as the consequence of and caused by credit-created unsustainable growth. This type of cyclical activity is preventable with an appropriate monetary framework but may be difficult to correct with short-run macroeconomic policy. A monetary policy based on the principle of sound—not stable—money would accommodate sustainable growth without generating endogenous instabilities and unsustainable growth.

While Garrison provides a clear explanation of business cycle phenomena, his work extends the analysis beyond the traditional focus of the cycle and provides a platform for future research. Chapters 5 and 6 use the basic capital-based macroeconomic model to develop preliminary Austrian insights on other important macroeconomic topics such as budget deficit, tax reform, risk and bubbles, and the boom-and-bust cycle in developing nations. Chapter 9, "Secular Unemployment and Social Reform," presents a novel and correct interpretation of Keynes. And as illustrated above, Garrison provides a new and very useful framework for comparing competing and complementary macroeconomic theories. Most important, Garrison's graphics provide a pedagogy that is useful from a principles level to a graduate level of instruction.

To place the importance of the book in a broader context, Brian Snowden, Howard Vane, and Peter Wynarczyk (1994, p. 351) recognize that Austrian (capital-based) macroeconomics offers "important insights and alternatives to mainstream macroeconomics." They argue the approach is one that has witnessed a major sustained revival of its fortunes during the past twenty years, due to the "commitment and tenacity of Mises and Hayek" and from the "contributions of a new generation of Austrian economists." Professor Garrison's work in Austrian macroeconomics over the past twenty-plus years has been among the most influential of these new contributions. *Time and Money* and its detailed development of a capital-based macroeconomics is the most important of these recent developments. The capital-based approach has the

advantage of providing a seamless macroeconomics of the short run, the medium run, and the long run, particularly when compared to current mainstream analysis, which lacks a medium run and has long-run and short-run models that are often in conflict. Cochran and Glahe (1999, p. 196) argue that it is only with a "greater understanding of the forces actually shaping events in a monetary production economy that we can make rational decisions about policy and monetary institutions." *Time and Money* is certainly a major contribution to our further understanding of these complex market processes.

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