

## ***ADDENDUM: TEXTBOOK CLASSICISM:***

### **THE CLASSICAL MODEL AS FOIL**

Robert Solow (2000) has recently called our attention to the overdrawn distinction between the short run and the long run in macroeconomic theorizing and suggests that the “medium run” is the more appropriate focus. *Time and Money*, which sets out a macroeconomics of the medium run, includes an extended comparison between the Austrian-oriented treatment of boom and bust and the corresponding labor-based macroeconomics of cyclical downturns found in Keynes’s *General Theory*. More commonly, the demand-oriented Keynesian relationships are contrasted with the supply-oriented relationships of the so-called classical model, a model without genuine pedigree. Typically, this contrast is but a preliminary step in the direction of a synthesis of demand-side Keynesianism and supply-side classicism. To establish the Austrian-oriented, capital-based macroeconomic framework as appropriate for the macroeconomics of the medium run, an equally relevant comparison is that between it and the typical textbook rendition of the classical relationships.

First introduced by Gardner Ackley<sup>1</sup> (1961, pp. 124-137) as a greatly simplified rendition of classical views, these relationships have gelled into an interlocking three-quadrant model that features (1) the aggregate production function, (2) the labor market, and (3) the equation of exchange. Figure 1 shows these three elemental quadrants and their interconnections. Panel 1 shows the aggregate production function, which takes the economy’s capital stock as given and relates the level of output to the (variable) labor input. The output (of both consumption goods and investment goods) increases as the labor input increase—but at a decreasing rate, owing to the decreasing marginal product of the one variable input. The curve itself shifts with changes in technology or in the size of the capital stock. Panel 2 shows the labor market, in which competitive conditions are assumed to prevail. The supply of labor reflects the

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<sup>1</sup>I am indebted to John Cochran for identifying Ackley, who served as Chairman of the Council of Economic Advisors in the Johnson administration, as the originator of this now-commonplace graphical model of classical relationships.

labor-leisure trade-off; the demand for labor is simply a derived demand, the demand price being determined by the marginal product of labor as depicted by the slope of the aggregate production function. These two panels together determine the values of the real variables in the macroeconomy. The real wage rate ( $W/P$ ) adjusts to clear the labor market, the equilibrium number of workerhours ( $N$ ) combines with the existing capital stock ( $K$ ) to produce the economy's equilibrium real output ( $Q$ ) and to generate its equilibrium real income ( $Y/P$ ).

Panel 3 shows the inverse relationship between real output ( $Q$ ) and the price level ( $P$ ), given the money supply ( $M$ ) and its velocity of circulation ( $V$ ). All along this equilateral hyperbola, nominal income ( $Y = PQ$ ) remains constant and—in accordance with the equation of exchange—equal to total spending on final output ( $MV$ ). With the level of real output determined by the other real magnitudes, the curve in Panel 3 identifies the price level consistent with classical macroeconomic equilibrium.

Variations on Figure 1 abound in intermediate macroeconomic textbooks written during the last three decades. This three-quadrant rendition is closest to that of Ekelund and DeLorme (1983, p. 84), lacking only a fourth quadrant that keeps track of movements in the nominal wage rate. More recent renditions include those of Farmer (1999) and Froyen (1999). Farmer (1999, p.100) inserts a dummy quadrant between the quadrants representing the aggregate production function and the equation of exchange. By reversing the axes for the latter relationship, this modification allows him to identify the equilateral hyperbola as “aggregate demand” and allows for a perfectly inelastic “aggregate supply” to appear as a vertical line whose horizontal intercept is the full-employment level of income. (Ekelund and DeLorme (1987, p. 72) made this same modification in the second edition of their text.) Froyen (1999, p. 62) presents the three quadrants (complete with the aggregate-supply and aggregate-demand designations) on a single page—but, for some reason or other, without actually aligning the quadrants and showing the interconnections among them.

Though possibly on the wane as a staple of macroeconomic pedagogy, classical theory in the guise of Figure 1 provides strong support for a movement of both theory and pedagogy toward a macroeconomics of the medium-run. The classical model is actually “run-conflicted” in a sense that is rarely acknowledged. Panel 1 can apply only to a run sufficiently short (maybe six-to-eighteen months) that the assumption of a constant capital stock is not

dramatically at odds with ongoing growth. Panel 3 can apply only to a run sufficiently long (maybe eighteen to thirty months and longer) that prices have fully adjusted to a change in the money supply or in velocity. There may be little if any scope for conceiving of a movement of equilibrium points along the curves of both Panel 1 and Panel 3. That is, short-run movements *along* the curve in Panel 1 will likely correspond to movements *off* the curve in Panel 3; and movements *along* the curve in Panel 3 will likely correspond to *shifts* of the curve in Panel 1. Having to make these kinds of allowances and adjustments in the application of the classical model is *prima facie* evidence that the model itself is run-conflicted.

The eclipse of the macroeconomics of the medium run is made obvious by the fact that virtually the whole of our capital-based macroeconomics deals

with a market process going on *within* the output aggregate that is tracked by the vertical axis of Panel 1. Output ( $Q$ ) is the output of both consumer goods ( $C$ ) and investment goods ( $I$ ). Though often advertized as a “complete classical model,” this model says nothing about how the economy's output is divided between consumption and investment—let alone how the output of investment goods is divided among the various stages of

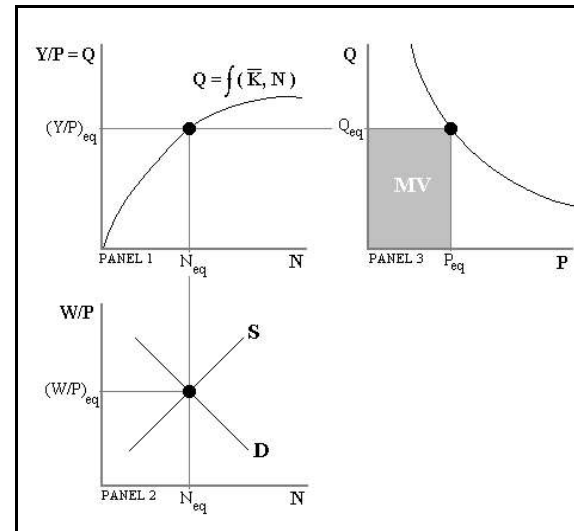


Figure 1: The Classical Model

production. Most of the textbooks (all three of the ones cited here) include a discussion of the classical loanable-funds market and its function in determining the level of investment in the same (or an adjacent) chapter that presents the complete classical model, but none actually integrate the supply and demand for loanable funds with the rest of the classical relationships.

Further, the use of a single labor market makes this rendition of classical macroeconomics a better foil for the presentation of Keynesian economics than an accurate representation of classical thinking. Equilibrating adjustments can entail adjustments only in *the* wage rate. Ruled out of consideration by construction is any scope for adjustments in relative wage rates that might move workers intertemporally from one stage of production to another in response to a change in the rate of interest.

The original model from which our Figure 1 evolved was, at least in application, as run-conflicted as the more modern variants. Ackley (1961, p. 133) presented Panels 1 and 2 and integrated them in the same manner as in Figure 1. But instead of employing a rectangular hyperbola to show how the price level must vary with real output, he used a linear relationship to show how nominal income ( $P_y$ ) must vary with the money supply ( $M$ ). A line emanating from the origin indicates that  $M$  must equal  $(1/V)(P_y)$ . This construction, at least in principle, would allow for an increase in the money supply to impinge on real income (and, equivalently, on real output) as well as on prices and wages. And with some part of the increased real output taking the form of investment goods, the construction would allow the aggregate production function to shift during the period that the economy was adjusting to a new equilibrium.

In application, however, Ackley (*ibid.*) limits the effects of an increase in the money supply in a way that makes our Figure 1 perfectly equivalent to the original rendition: “The result of a monetary increase, then, is to raise wages and prices in equal proportion, leaving output, real wages, and employment unaffected.” This result is shown in Figure 2, where the area inscribed under the rectangular hyperbola changes from  $MV$  to  $M'V$ . In response, all nominal variables change in the same ratio of  $M'/M$  and no real magnitudes change at all. These, of course, are the long-run consequences of a monetary increase. But what are the short- and medium-run consequences? Did the new money enter the economy through credit markets? Were interest rates impacted? How was the allocation of resources affected? Was the pre-existing aggregate production function applicable throughout the adjustment process? If not, how did it somehow reconstitute itself just as the general level of prices became fully adjusted to the higher money supply?

Though modern renditions of the classical model are faithful to Ackley’s, the recognition of how this model actually relates to classical thought has been largely lost. Ackley himself recognized the nature—though, I would

argue, not the significance—of the simplifying assumptions needed to transform classical thought into the classical model. His introductory remarks are revealing:

Actually, Classical *price theory* (as opposed to *monetary theory*) implies that the volume of employment and output is determined in the first instance not by the *level* but by the *structure* of prices. ... We shall simplify this part of the analysis very greatly by assuming (1) that perfect competition prevails in all industries; and (2) that each industry is vertically integrated: it hires only labor and produces final output (using a given stock of capital goods and natural resources); there are no intermediate goods. These assumptions can be removed with no major change in results... (Ackley, 1961, p. 124).

While the dichotomization of price theory and monetary theory is characteristic of much of classical thought, it was certainly not characteristic

of the writings of Hayek, who was the acknowledged arch rival of Keynes and whose theorizing Keynes clearly included under the “classical” umbrella. For Hayek, the structure of prices that govern the various stages of production were as relevant to his macroeconomic theorizing as to his microeconomic theorizing. Accordingly, Ackley’s second simplifying assumption

(complete vertical integration and the absence of intermediate goods) removes from consideration the essential equilibrating mechanism that is central to Hayek’s theorizing.

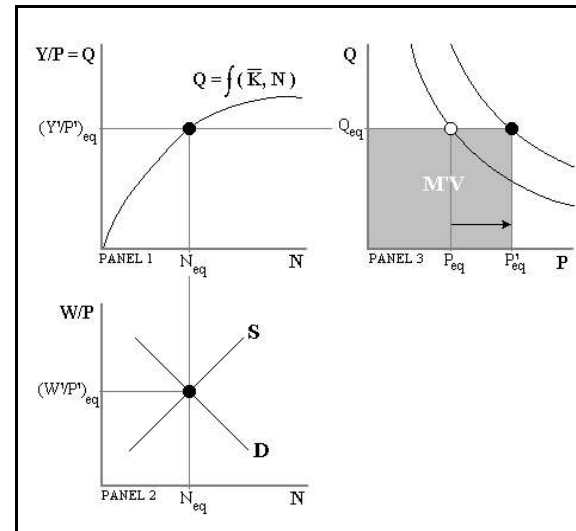


Figure 2: The Classical View of Monetary Expansion

## A SUMMARY VIEW

Reacting in the early 1930s to Keynes's *Treatise on Money*, Hayek (1931, p. 277) summed up his criticisms with the remark that "Mr. Keynes's aggregates conceal the most fundamental mechanisms of change." It is those same fundamental mechanisms that were explicitly concealed by Mr. Ackley's simplifying assumption and that are concealed by default in modern macroeconomic texts. In view of the dissatisfaction with modern macroeconomic theorizing expressed by Solow, we now see that the effect of Ackley's simplifying assumption was to convert a macroeconomics of the medium run into a run-conflicted macroeconomics.

Capital theory and monetary theory are intertwined in a way not recognized in modern theory and modern pedagogy. The nature and significance of money-induced price distortions in the context of a time-consuming production processes was the basis for my early article "Time and Money: the Universals of Macroeconomic Theorizing" (1984) and for my recent book *Time and Money: The Macroeconomics of Capital Structure*. Capital-based macroeconomics is an account of the economy's intertemporal market mechanisms. It answers the fundamental question "How do these intertemporal market mechanisms work?" before it addresses the follow-on question "What might possibly go wrong?" Capital-based business-cycle theory is a story about how the economy's production process that transforms resources into consumable output can get derailed.

This Austrian-oriented macroeconomics is tailor-made to deal with the very kinds of issues that Solow (2000, p. 154) finds most worthy of our attention. "[I]t is anyone's guess whether the U.S. productivity trend is now tilting back toward the higher growth rates of the first few decades after the war or merely experiencing a blip that will eventually go back to slow growth." Attention to changes in the economy's intertemporal capital structure as governed by changes in the rate of interest gives rise to a clear distinction between sustainable and unsustainable growth. The question of sustainability resolves itself into a question of whether the changes in the interest rate are attributable to changes in real factors or to policy activism. And while there are no pat answers to replace "anyone's guess," the Austrian's focus on the medium run provides a relevant basis for making judgments about sustainability of the economy's growth rate. This is the macroeconomics of the medium run.

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