Marshall University
Marshall Digital Scholar

7-1-1997

Introducing Students to the Competing Schools of Thought in Intermediate Macroeconomics

Harlan M. Smith II
Marshall University, smithh@marshall.edu

Follow this and additional works at: http://mds.marshall.edu/econ_faculty

Part of the Economic Theory Commons, Labor Economics Commons, and the Macroeconomics Commons

Introducing Students to the Competing Schools of Thought in Intermediate Macroeconomics

Harlan M. Smith II

Consider the following question: "Why do output and employment fluctuate in the short run?" My purpose in this article is to show how the intermediate macroeconomics instructor can introduce students to the ways in which old Keynesians, new Keynesians, and new classical theorists of various stripes have addressed this question, without recourse to explicit macro-modeling or to microeconomics beyond the principles level. By making use of an introductory-level microeconomic model of an economy's aggregate labor market, I show how the instructor can present--and directly compare and contrast--the insights of these schools of thought in a six-lecture classroom unit that can be embedded within several different types of one-semester inter-mediate macro courses. This approach can be used by (and is designed for) instructors whose students have only rudimentary mathematical tools and have not had intermediate micro-economics.

The exclusive focus I place upon the aggregate supply side of the macroeconomy is a useful pedagogical technique that allows the instructor to introduce students to the principal competing schools of macro thought within six class periods.[1] To engage students in a compre-hensive study of how these schools of thought attempt to explain short-run business cycles, of course, requires more time, effort, and modeling activity. For example, I include no formal discussion of the differences across these schools that relate to aggregate demand. Moreover, providing students with a sense of how to bring empirical evidence to bear upon the schools-of-thought debate is a separate task, one that should not be confused with what I believe to be the instructor's first goal: to make sure that the students acquire an understanding of the essential differences among these research traditions, via an approach that is as unified and nontechnical as possible. I offer this six-lecture unit as a "hook" that can be used to help pull a class into a more complete discussion--tailored as the individual instructor sees fit--of how macroeconomists seek to understand the short-run behavior of the economy.

In the first two lectures, I construct a benchmark model of the aggregate labor market--using principles-level analysis--in which the unemployment rate is equal to the natural rate (hence, output equals potential), and employment and output do not fluctuate.[2] The two ways in which old (or Traditional) Keynesians have relaxed the conditions that define the benchmark model to generate short-run fluctuations in employment and output--and the refinement of the second approach that was developed in the nascent new Keynesian literature of the late 1970s—constitute the bulk of the third lecture. I can then use the benchmark model to discuss the objections to these approaches that some economists raised during the 1970s and move naturally into the fourth lecture, where I illustrate two ways in which new classical thought, from the early Lucas and Barro efforts to modern real business cycle (RBC) theory, seeks to explain short-run fluctuations in employment and output. In the fifth lecture, I begin by presenting the essence of the modern new Keynesian response to the new classicals. I then make use of the familiar aggregate labor market framework to illustrate, in the last one-and-a-half lectures, how two representative strands of modern new Keynesian analysis can be combined to generate a business

cycle. I conclude this article with a discussion of the benefits of this approach for both the instructor and the students and comment on how to insert this unit in a one-semester course.

LECTURES 1 AND 2: THE BENCHMARK AGGREGATE LABOR MARKET

Consider an economy in the short run: in both quantity and quality (productivity) terms, its resource base is fixed. Suppose that all nominal prices, including the wage rate (W), are perfectly flexible, so that all markets, including the labor market, clear continuously via price adjustment. Let perfect competition prevail in all markets. Further, assume that all individuals maximize utility, all firms maximize profits, and all economic agents have full and perfect information concerning the domestic price level (P). This last assumption can be stated another way (which will prove useful in lecture 4): All economic agents are always correct in their expectations of P.

Together, these assumptions imply that both the demand for and the supply of labor are functions of the real wage (W/P), the labor market is continuously in equilibrium at "full employment"--at an unemployment rate that is equal to the natural rate--and the economy's short-run aggregate supply curve (SRAS) is vertical at the given level of potential real gross domestic product (GDP).[3] Thus, and this is the key point to emphasize, changes in desired real aggregate demand (DRAD) may lead to price-level changes but not to changes in employment and output, because the market-clearing level of employment is unaffected by changes in P. These conclusions can be developed in the classroom.

Equilibrium in the Labor Market

Consider the aggregate production function $Y = f(N, K)$, where Y is real GDP, N is worker-hours per year, and K is the fixed capital stock. The assumption that the marginal product of labor is positive and diminishing leads to an inverse relationship between the demand for labor and the real wage. If the supply of labor is an increasing function of the real wage, then the resulting labor-market equilibrium, given the prevailing price level P_0, is illustrated in Figure 1 (a graph of the labor market in nominal wage-employment space).[4] The instructor should help the students interpret the key macroeconomic lesson contained in this figure: no unemployment is caused by insufficient labor demand. Aside from those unemployed for frictional or structural reasons, no one is seeking work at (W_0/P_0) who is unable to find work. In other words, there is no cyclical unemployment, which implies that the economy's unemployment rate is equal to the natural rate. When N^* is combined with the fixed capital stock in the economy's aggregate production function, the resulting level of output is equal to potential real GDP.
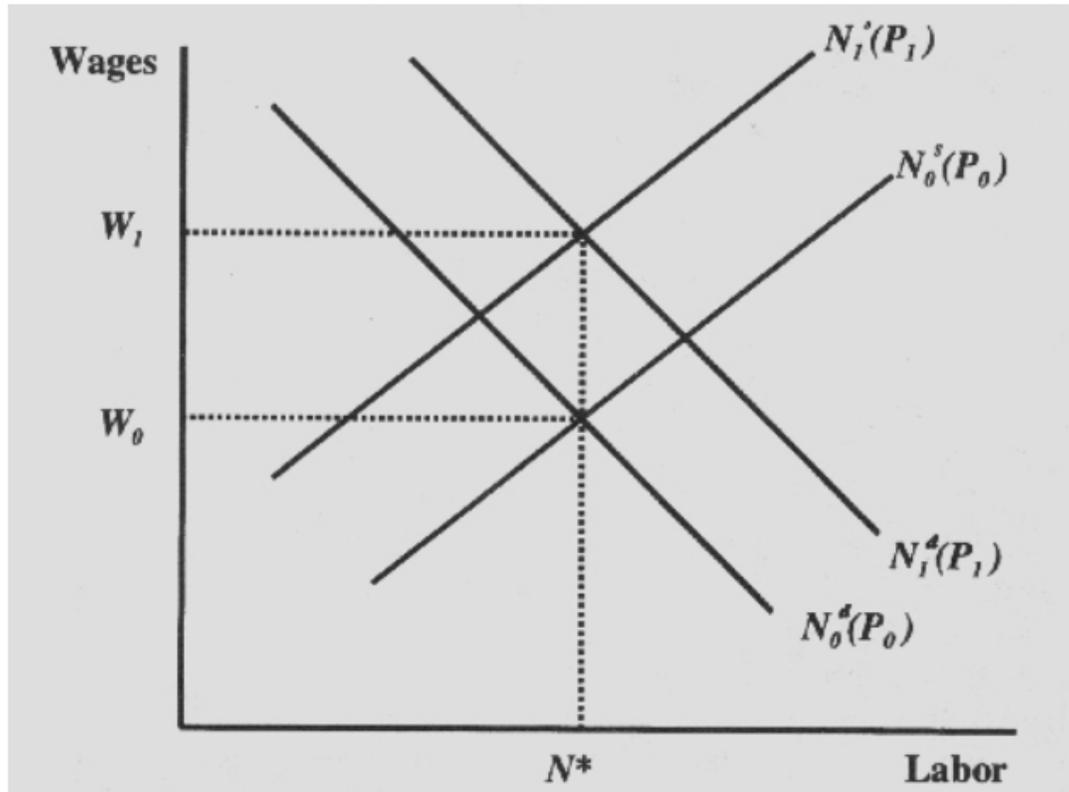
FIGURE 1; The Benchmark Model

The Effects of Price-Level Changes

Let the price level rise to P_1. Both the demand and supply functions in Figure 1 shift upward in proportion to the rise in P to $N^{d, sub\ 1}$ and $N^{s, sub\ 1}$, respectively, because the amounts of labor demanded and supplied are influenced solely by the real wage.[5] As a result, the market-clearing nominal wage rises to W_1. The proportionate rise in W thus matches the proportionate rise in P, the real wage does not change, employment stays at N^*, and output remains at potential.

There is no relationship between P and Y on the supply side of the macroeconomy: in (P, Y) space the economy's SRAS function is vertical at potential output. Output is, therefore, supply determined, and the economy cannot experience business cycles, if a business cycle is defined as a situation in which the current level of production does not equal potential real GDP. Furthermore, as long as the economy is in the short run (as defined above), real GDP will not fluctuate at all.

LECTURE 3: OLD KEYNESIANS, EARLY NEW KEYNESIANS,
AND THE LABOR MARKET

Keynesian macroeconomics can be characterized as a school of thought developed around two central propositions:[6]

1. Changes in desired real aggregate demand (DRAD) lead not only to changes in P but to changes in real GDP relative to potential (to changes in the unemployment rate relative to the natural rate) and hence are one factor driving the business cycle.
2. Macroeconomic policy, to the extent that it can influence DRAD, is effective (is able to influence real GDP relative to potential, hence the unemployment rate) in the short run.

In defending these propositions, Keynesians old and new have often looked to the labor market--and have relaxed some of the assumptions underlying the benchmark model of lectures 1 and 2--to argue that a link exists between the price-level changes resulting from fluctuations in DRAD and changes in employment and output. One way of generating such a linkage, adopted at times by old Keynesians, is to relax the assumption that the supply of labor is a function of the real wage. A second approach, involving the relaxation of the assumption that nominal wages are perfectly flexible, was adopted by old Keynesians and developed further in the early new Keynesian literature of the 1970s. Let us consider the implications of each of these methods.

Suppose that labor supply is a function of the nominal wage but that all other assumptions defining the benchmark model remain intact. This situation is illustrated in Figure 2, where the current price level is P_0, the current equilibrium nominal wage is W_0, and the current equilibrium level of employment is N^*--the full-employment level of employment.

Consider the effects of a rise in P, from P_0 to P_1. The demand-for-labor schedule shifts upward in proportion to the rise in P (as in Figure 1), but labor supply is unaffected. The nominal wage rises to W_2 to eliminate the excess demand for labor that develops at W_0. As a result, real wages fall $[(W_2/P_1) < (W_0/P_0)]$, the equilibrium level of employment rises to $N^{*'}$, and output increases. Should the price level fall, exactly the reverse happens: nominal wages fall, real wages rise, employment declines, and real GDP decreases. The economy's SRAS function is therefore upward sloped: rises (falls) in DRAD pull up (pull down) prices, and hence employment and output increase (decrease).

Suppose instead that all but one of the assumptions characterizing the benchmark model of lectures 1 and 2 are retained: let nominal wages be sticky, that is, imperfectly flexible. Under these conditions, labor-market disequilibria can arise and persist, as illustrated in Figure 3; in this case, the initial full-employment equilibrium configuration is characterized by (P_0, W_0, N^*).

Now let the price level rise, as before, to P_1. Both $N^{d, \text{sub } 0}$ and $N^{s, \text{sub } 0}$ shift upward by the same amount (as in the benchmark case), but the nominal wage rises only to, say, W_3, and disequilibrium prevails in the labor market. The instructor should now emphasize that what actually happens to the level of employment depends on how this disequilibrium is resolved. The students should be introduced to the concept of a "rationing rule" and the necessity of one being operative in markets not cleared by price adjustment.

One reasonable rationing rule that the instructor should explore with the students, in the context of Figure 3, is that whenever the labor market is in disequilibrium, the level of employment is determined by the short side of the market.

If this rule is operative, then employment falls to $N^{*'}$ as the price level rises to P_1. This generates a situation in which an expansion in DRAD, to the extent that it pulls up the price level, leads to a fall in real GDP in the short run. Furthermore, if DRAD and prices both decline, then so does employment. This rationing rule, therefore, cannot be part of a model that generates "standard" Keynesian policy conclusions.
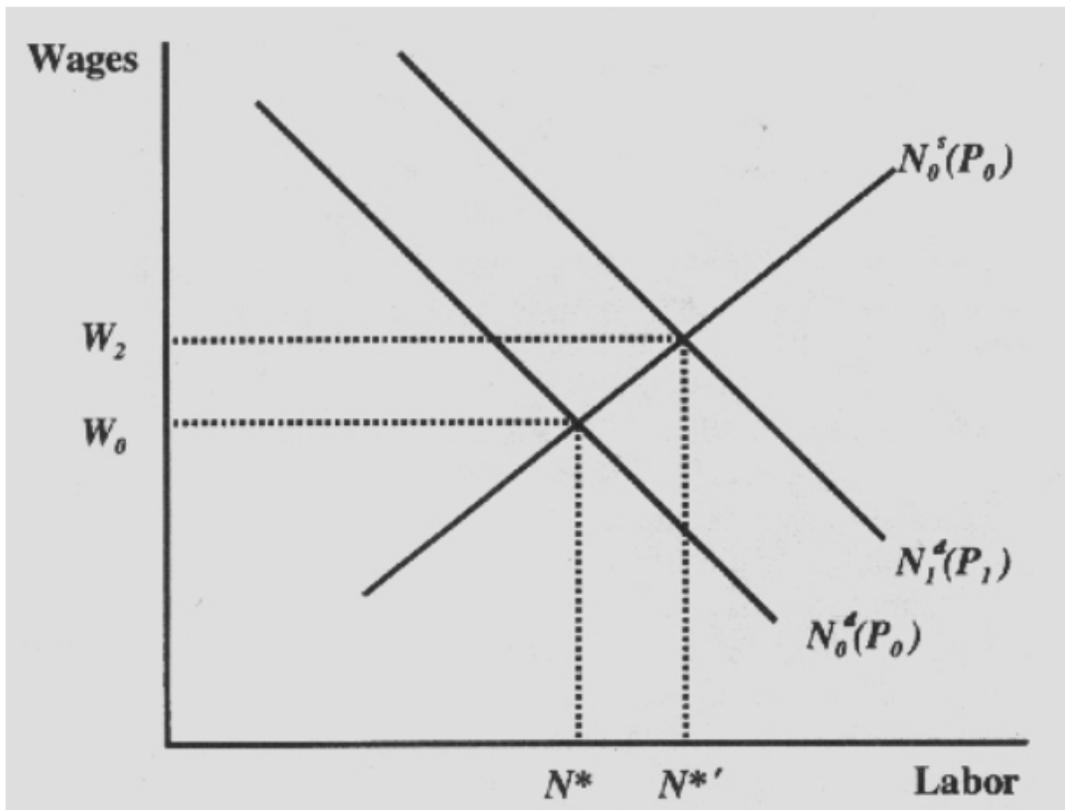

FIGURE 2; Labor Supply as a Function of the Nominal Wage

Students should learn from this example that macroeconomists cannot appeal to sticky nominal wages alone--without considering explicitly how the labor market clears in the absence of price adjustment--in order to develop the short-run link between DRAD and output that provides the basis for Keynesian policy prescriptions. Indeed, as this lesson sank in, the early new Keynesians of the 1970s who continued to incorporate nominal-wage stickiness into their macroeconomic models posited a specific rationing rule in the presence of labor-market disequilibria and argued for it on the basis of its consistency with key institutional features of the labor market. They hypothesized that whenever an excess supply of, or demand for, labor arises, the level of employment is determined by labor demand. Workers, in other words, get pulled off their labor-supply functions as labor-market disequilibria get resolved. Why? Because of the long-term contracts they have signed, which in general specify nominal rather than real wages over the contracts' lifetimes.[7]

This rationing rule generates the desired upward-sloping SRAS function that lies at the heart of Keynesian macroeconomics. To show this, use Figure 3 and have students reconsider the effects of a rise in P (from P_0 to P_1) driven by an increase in DRAD. Because of long-term contracts that to some extent lock in nominal wages in the short run, the nominal wage rises only to W_3 and the real wage declines. Employment rises to N^{*}" as firms willingly hire more labor at the lower real wage and workers supply more labor, even though they know that real wages have fallen, in the context of the long-term contracts. Suppose, on the other hand, that DRAD declines and that prices fall as a result. The presence of long-term contracts prevents nominal wages from falling enough to clear the labor market, real wages rise, and firms demand less labor. As workers get dragged off their labor-supply functions, employment declines.
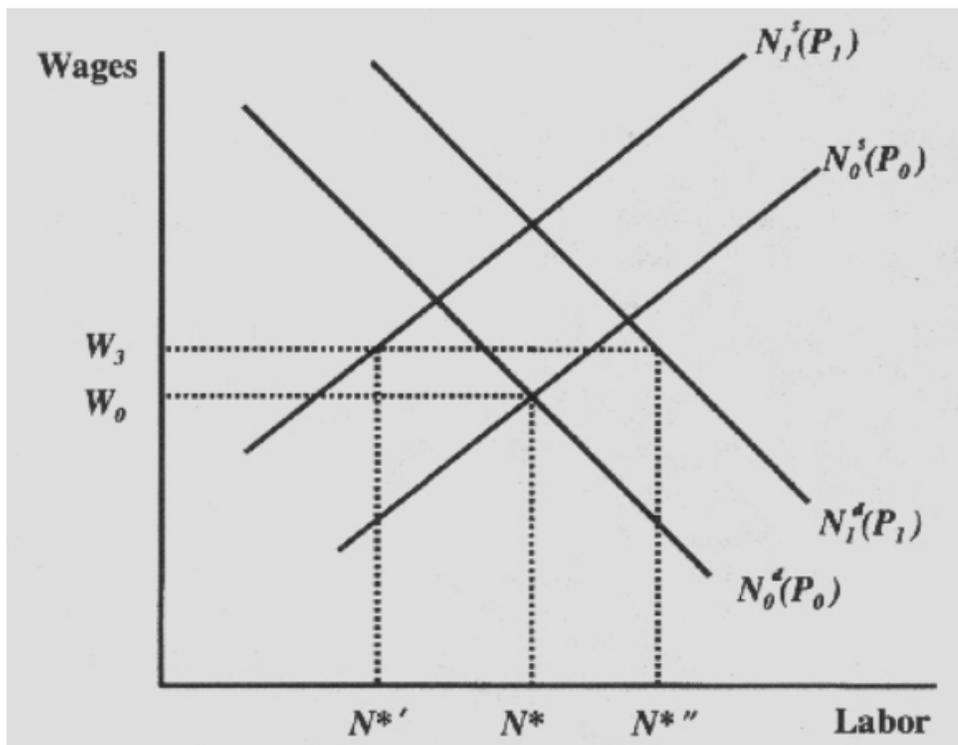

FIGURE 3; Sticky Nominal Wages

Now the instructor is in position to discuss the key criticism that some macroeconomists began to level at these Keynesian analyses in the early 1970s, which Charles Plosser stated concisely: "The essential flaw in the Keynesian interpretation of macroeconomic phenomena was the absence of a consistent foundation based on the choice-theoretic framework of micro-economics" (Badly and Friedman 1995, 462). Thus, to relax the assumption that labor supply is a function of the real wage is tantamount to dropping the hypothesis of utility maximization; sticky nominal wages that generate non-market-clearing and involuntary unemployment in recessions appear to be inconsistent with the principle of economic rationality because they appear to give rise to persistent, unexploited profit opportunities. Research to date has not been able to provide an explanation derived from the first principles of microeconomics for the existence of sticky-wage variable-employment contracts.

## LECTURE 4: NEW CLASSICAL RESPONSES

Macroeconomists who were particularly concerned about the unsatisfactory microeconomic underpinnings of old Keynesian and early new Keynesian analysis began, in the early 1970s, to develop alternative ways of explaining short-run movements in output and employment while still maintaining three of the key assumptions that characterize the benchmark labor-market model of lectures 1 and 2: all individuals maximize utility, all firms maximize profits, and all markets clear continuously via price adjustment. Their work, which became known as new classical thought, at first focused on the implications of relaxing the assumption that all labor-market participants have full and perfect information concerning the price level. In recent years, new classicals have developed an alternative approach to explaining short-run fluctuations in employment and output--real business cycle theory--by essentially redefining the concept of the short run. Let us begin by considering the first of these two approaches.

Suppose that all labor-market participants do not always have complete information concerning the price level (i.e., all agents are not always correct in their expectations of P), in a context in which all the other assumptions characterizing the benchmark model of lectures 1 and 2 remain in place. More specifically, suppose that in the face of price-level changes, firms form a more accurate estimate of the new P than do workers.[8] Without loss of generality, it can be assumed that firms are always correct in their estimates of P but that workers require time to discover the true price level whenever P changes unexpectedly. This implies that firms always know the prevailing real wage, whereas workers do not.

The implications of this pattern of imperfect information are illustrated in Figure 4. Suppose that initially all agents know the prevailing price level (P_0), and thus that the equilibrium level of employment at W_0 is equal to N^* or full employment.[9] Now let the price level rise unexpectedly to P_1 because of, say, an unexpected increase in DRAD. Firms are aware of this price-level increase, so the labor-demand function shifts upward to $N^{d, sub 1}$ in proportion to the rise in P (as in Figure 1). But the operative labor-supply schedule remains No, because the supply of labor is driven by the perceived real wage, which for the moment has not changed. The nominal wage thus rises to eliminate the excess demand for labor that develops at W_0, and the actual real wage (W_2/P_1) falls below the original real wage (W_0/P_0). Firms know this, but

workers do not. The former thus willingly hire more labor, and the latter voluntarily accommodate this increase in demand, because they believe that the real wage has risen to (W_2/P_0). The equilibrium level of employment thus rises to $N^{*\prime}$, and real output rises above the economy's level of potential real GDP. Over time, however, the workers' misperceptions concerning P are corrected. As a result, the labor-supply schedule shifts upwards to $N^{s,\text{sub }1}$ the equilibrium nominal wage rises to W_1, the actual and perceived real wages converge to (W_0/P_0), and the economy returns to full employment.

Should DRAD decline unexpectedly, leading to a surprise fall in P, the reverse happens. The labor-demand schedule shifts down relative to labor supply, actual real wages rise as the labor market clears, and firms cut back on employment. Workers mistake, for a time, the fall in W for a fall in the real wage and therefore willingly offer less labor in the market. The equilibrium level of employment falls, and so does real GDP relative to potential. As workers become informed about the new price level over time, however, the equilibrium level of employment will return to N^{*}, and output will converge toward potential.

FIGURE 4
Imperfect Information
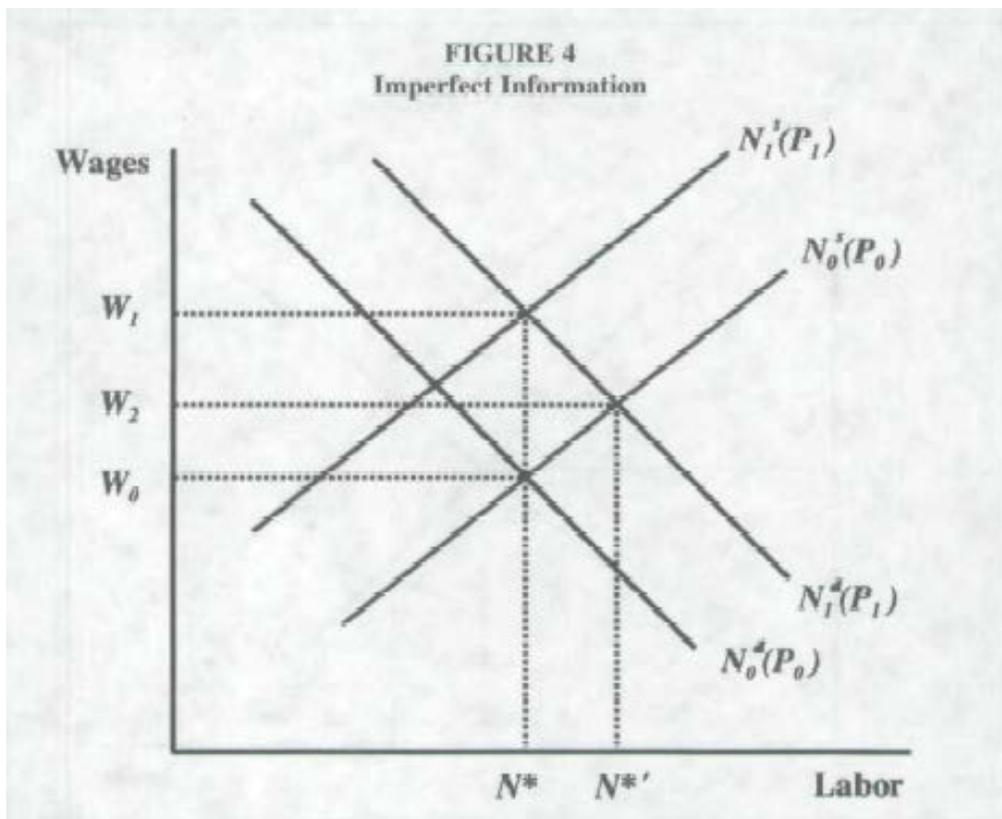
The instructor should now emphasize that this method of explaining short-run movements in employment and output generates an upward-sloping SRAS function, and can be used to illustrate business cycle phenomena, just like the Keynesian models of lecture 3. But in this market-clearing framework, the positive relationship between P and Y on the supply-side of the economy exists only to the extent that, and only as long as, there are misperceptions concerning the actual price level in the economy. It is not all fluctuations in DRAD that influence employment and output but only those fluctuations that are unanticipated by private-sector economic agents.

RBC theorists do not rely on imperfect information to explain short-run movements in employment and output. Instead, they retain all the assumptions that define the benchmark model of lectures 1 and 2 but argue that in the short run the state of technology, and hence the form of the economy's aggregate production function, can and does change. The short run is thus characterized in part by changes in the marginal product of labor at all employment levels. As real wages fluctuate with the demand for labor, employment and output adjust in the short run (Figure 5).

FIGURE 5
Real Business Cycle Theory
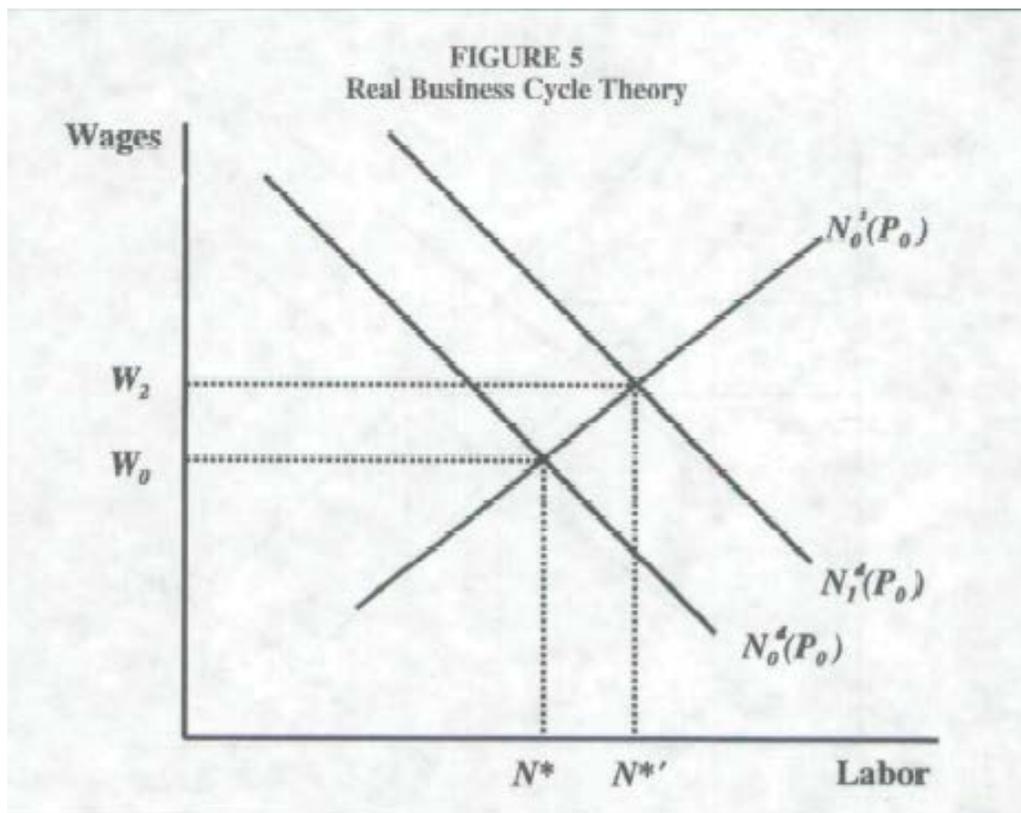
Suppose that initially the labor market is in equilibrium at N^*--the full-employment level of employment--given price level P_0 and nominal wage W_0. If a change in technology occurs that raises labor productivity, the labor-demand function shifts upward to $N^{d, sub 1}$. With no change in the price level, the labor-supply schedule remains at No. The nominal wage rises to W_2 to clear the labor market, and real wages rise as well [$(W_{2/P[sub 0]}) > (W_0/P_0)$]. As a result, the equilibrium level of employment rises to $N^{*'}$ and output increases. If, however, a change in technology leads to a reduction in labor productivity, the reverse happens: the labor-demand function shifts downward relative to labor supply, nominal and real wages fall, employment declines, and real GDP decreases.

The instructor should point out that these short-run movements in employment and output do not translate into changes in the unemployment rate relative to the natural rate (hence, into changes in output relative to potential). Have the students recall a key implication of the benchmark labor-market model of lectures 1 and 2: the economy's SRAS function is vertical at potential output. Remind them that all the assumptions that together generate this result are maintained by RBC analysts. The changes in output identified by these theorists should be interpreted as fluctuations in potential real GDP. Movements in DRAD, therefore, do not play a role in short-run economic fluctuations; the business cycle is a creature of changes in technology, a reflection of disturbances to the real side of the economy.[10]


LECTURES 5 AND 6: MODERN NEW KEYNESIANISM

Although the two new classical attempts to explain short-run movements in employment and output are grounded within an explicitly microeconomic context, new Keynesians reply that the explicitness of a set of microeconomic underpinnings guarantees neither its completeness nor its appropriateness. For example, with respect to the earlier imperfect-information incarnation of new classical thought, new Keynesians are troubled by the rationale for the specific pattern of imperfect information hypothesized.[11] Furthermore, the representative agent approach employed in modern new classical modeling assumes away aggregation problems. More generally, modern new Keynesians argue that market-clearing models cannot adequately explain short-run fluctuations in employment and output. They point to the evident unhappiness of many economic agents in recessions, for example, to argue that a cyclical downturn may not be the optimal response of the macroeconomy to outside shocks but rather a suboptimal situation in which markets are not clearing--and thus a reflection of an economy-wide market failure.

Nevertheless, modern new Keynesianism accepts the validity of the new classical critique of earlier Keynesian analysis, acknowledges that it must be addressed and, indeed, takes that criticism as a challenge. The goal of this school of thought can be stated as follows: to show how wage and price stickiness, with its non-market-clearing and business cycle implications, can be consistent with the principle of economic rationality. Put another way, modern new Keynesianism seeks to "show how firms and workers can make choices that maximize business profits and worker well-being at the microeconomic level but have adverse social consequences at the macroeconomic level" (Gordon 1993, 211).

Modern new Keynesianism, therefore, can be interpreted as seeking to explain short-run movements in output and employment while maintaining three of the key assumptions that define the benchmark labor-market model of lectures 1 and 2: all individuals maximize utility, all firms maximize profits, and all agents have full and perfect information concerning the price level.[12] The instructor can now make use of the aggregate labor-market framework constructed in lectures 1 and 2 to present and combine the essentials of two representative strands of modern new Keynesian analysis--efficiency wages and menu costs--to give the students insight into how this school of thought approaches the microeconomics of wage-price stickiness and how that stickiness can generate short-run fluctuations in output and employment.[13] Let us turn now to the first of these two lines of analysis.

Efficiency-wage theory is built on the hypothesis that worker productivity (effort, e) is a positive function of the real wage.[14] The efficiency wage itself, denoted here as w^*, is the real wage that maximizes the amount of worker effort per dollar of real wages paid. Consider the implications of this theory in a setting where all firms are profit-maximizers, all workers maximize utility, and all agents have full and perfect information concerning movements in P (Figure 6). Notice that although the labor-supply function is anchored in place by the prevailing price level P_0, 0the location of the labor-demand function depends on the current price level and the (exogenously determined) relationship between worker effort and the real wage. Hence the inclusion of e^*, the amount of effort induced by the efficiency wage w^*, as an argument of $N^{d, \text{sub } 0}$.[15]

FIGURE 6
Efficiency Wages
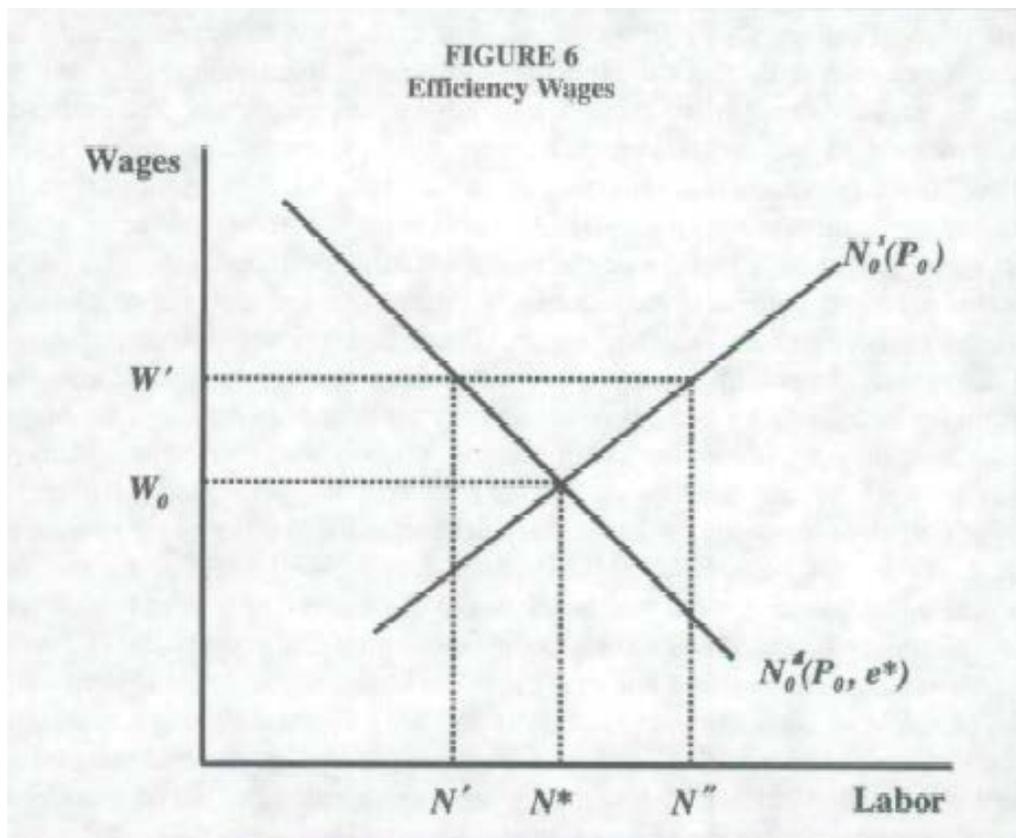
If the labor market clears, the real wage would equal (W_0/P_0), employment would equal N^*, and output would equal potential real GDP. But firms may not find it in their self-interest to pay the market-clearing real wage, for they will maximize profits only if they pay the efficiency wage. Suppose that $w^* = (W'/P_0) > (W_0/P_0)$. Employment, therefore, is equal to N', and an excess supply of labor equal to (N" - N') exists. This excess supply of labor appears to represent a profit opportunity that is not being exploited. Why do not firms cut their real wages? Why are the unemployed workers unable to bid down wages and gain employment? Because it is not in the firm's profit-maximizing self-interest to pay a real wage below w*.[16] Efficiency-wage theory thus shows how the interaction of optimizing agents in the labor market can generate non-market-clearing and involuntary unemployment.

Another modern new Keynesian research tradition, menu-cost analysis, is concerned with how business cycles can be derived from the microeconomics of pricing behavior in an imperfectly competitive product market. More specifically, in a context where all workers maximize utility, all firms maximize profits, and all agents have full and perfect information concerning the price level, let the business sector be characterized by monopolistic competition. Suppose, furthermore, that the typical firm finds it costly to adjust its price because to do so it must pay menu costs (any expenses associated with making a price change).[17]

In the presence of these costs, it may not be in a monopolistically competitive firm's self-interest to adjust its price continuously, in response to fluctuations in the demand for its product. Why? The costs of not getting the price exactly right in the face of demand shifts (i.e., the loss of profits) may not be that great (unlike the situation under perfect competition). Put another way, the increased profits obtained from continuously maintaining the right price may be small and less than the costs of implementing price changes. If this is the case, a profit-maximizing firm will not change its price in response to demand fluctuations but will instead meet the demand that is forthcoming at the set price, and adjust production in response to shifts in its demand curve. If enough firms in the economy behave this way, economy-wide nominal price stickiness can exist in the short run, and so changes in DRAD can generate fluctuations in output relative to potential.

Short-run movements of output in response to changes in DRAD indicate that employment must be fluctuating as well. To illustrate these employment implications, and to generate a more complete modern new Keynesian explanation of the business cycle in the context of our aggregate labor-market framework, the instructor can combine menu-cost theory with the efficiency-wage hypothesis. Suppose that initially firms are paying an efficiency wage (W^*/P_0) that exceeds the market-clearing real wage, so that an excess supply of labor prevails (Figure 7).

Now let DRAD decline. The key point to emphasize is this: If the nominal price level is sticky at P_0, then both $N^{s, \text{sub } 0}$ and $N^{d, \text{sub } 0}$ do not shift position. Because firms cannot now sell the amount of output they had initially been selling, the business sector reduces its demand for labor to, say, N'". Given the efficiency wage, both firms and workers are now unable to operate on their respective "voluntary" labor-market functions. Firms cannot hire the labor they wish to at

(W'/P_0) because of the output constraint they face in the product market. Also, at the going real wage, workers are unable to sell all the labor they desire to sell.[18]

FIGURE 7
Menu Costs Combined with Efficiency Wages
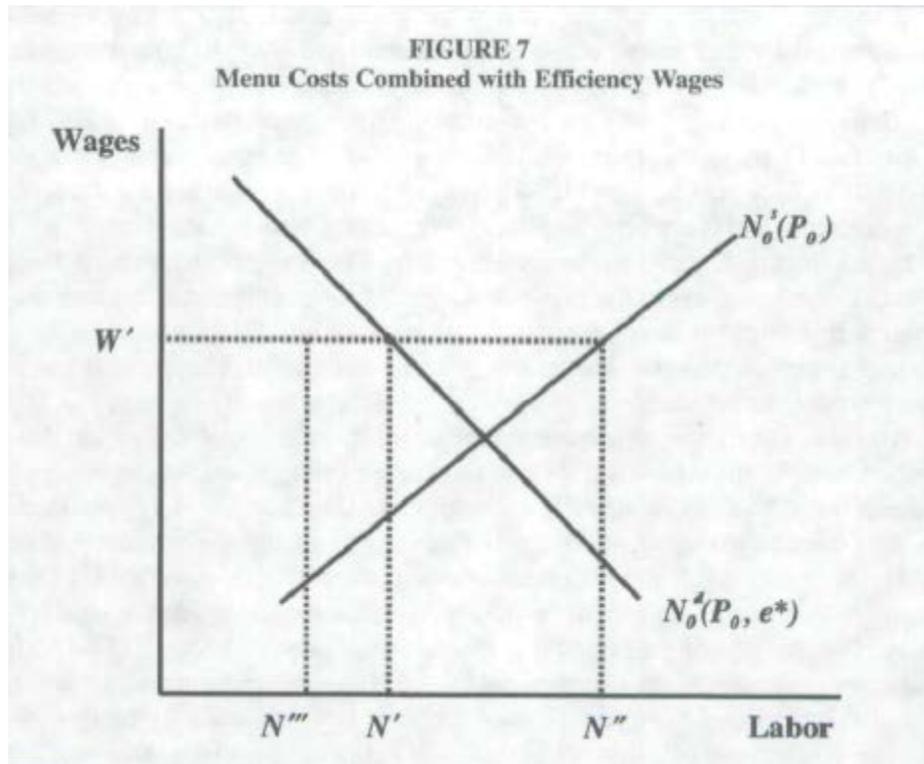
A decline in DRAD, therefore, results in falls in output and employment, and the amount of involuntary unemployment increases. Alternatively, an expansion in DRAD leads to increases in output and employment and to a decline in the amount of involuntary unemployment in the economy. Menu-cost theory, therefore, when combined with the efficiency-wage hypothesis, represents one way in which modern new Keynesianism seeks to develop a nonvertical SRAS function--and an explanation of recessions as socially suboptimal outcomes characterized by non-market-clearing--in a setting where private economic agents act in accord with the principle of economic rationality.

CONCLUSION

This approach to presenting the competing schools of thought in intermediate macroeconomics can generate the following benefits for both the students and the instructor:

1. The students are introduced explicitly to the relationship between microeconomic principles and macroeconomic analysis and review quite a few microeconomic concepts along the way.
2. The students are introduced explicitly to the logic of macroeconomics and macroeconomic inquiry, as they are exposed to how economists attempt to address one of the larger questions facing the discipline.

3. The instructor avoids having to present modern macroeconomics by developing fully a set of alternative, AS/AD-based macro models for the students, who
   a. probably do not have the time to absorb them, let alone to gain an appreciation of the perspective on economic behavior that motivates each school of thought, and
   b. cannot be expected, in many circumstances, to have the technical expertise to cope with all of these models on their own terms.
4. This approach can save time and thereby enable the following depressing (and unfortunately all-too-familiar) outcome to be avoided:
   a. the instructor rushes through all the models,
   b. the insights of each get lost in the blizzard of technical details, and
   c. the students reduce macro-theory to "it's all just a matter of opinion."
5. Finally, this approach is not school-of-thought specific, nor is it inappropriate for courses that require intermediate micro and/or lots of mathematics as prerequisites. It can thus be integrated into whatever kind of course the instructor is inclined to teach.

Point number 5, in conjunction with the fact that the approach offered here is a hook to pull the students into the schools-of-thought debate, rather than a complete tour through modern macroeconomics, leads to the following question: Where can the instructor place this unit in the course? I offer several possibilities. First, the instructor may want to develop the modern new Keynesian macroeconomic model and use it to engage in policy analysis in the main body of the course and introduce new classical thought "around the edges." The approach I have outlined provides, I believe, an excellent way to spend either the last two weeks or the first two weeks of such a course. If employed at the beginning, this unit can serve as a motivating prelude to a more complete development of modern new Keynesian analysis. This lecture series could, alternatively, be used during the last two weeks of the term to present and summarize the key insights of the new classical revolution and to force the students to step back from the technical macro-modeling they have been struggling to master to focus explicitly on one of the larger, more general questions in macroeconomics. Finally, should the instructor prefer to focus primarily on new classical analysis during the course, this six-lecture format can provide a way of presenting the essence of Keynesian macroeconomics and motivating the study of new classical thought within the first few weeks of the term, leaving the rest of the time free for a more complete, technical presentation of the new classical macroeconomics.

NOTES

1. Whether students should be taken through this material constitutes a separate issue. There are strong feelings--and good arguments--both for and against setting aside a portion of the semester to focus on the competing schools. I do not enter this debate here.

2. I do this because I believe that for students to understand and appreciate how and why employment and output can change in the short run, they must first be made perfectly aware of the conditions under which employment and output cannot fluctuate in the short run.

3. If this unit is presented at the end of a course that is centered around a text such as Dornbusch and Fischer (1994), the students are already familiar with the SRAS function. If it is presented at the beginning of the term, prior to any macro modeling, then, of course, the instructor cannot assume that the students have a solid grasp of the SRAS function. One can presume, however, that they were exposed to it (at least to some extent) in their one- or two-semester principles prerequisite.

4. Because much of what will be done in these lectures involves developing the impact of changes in P on labor-market conditions, it is useful to cast the labor market in this graphical space right from the beginning.

5. Because I have learned that students rarely grasp the economics behind these shifts without additional elaboration, I take time to discuss the point (W_1, (N^*) and show why it lies on both functions.

6. The reader may not agree completely with my definition of Keynesian macroeconomics. Even in the "Symposium on Keynesian Economics Today" in the Winter 1993 issue of the Journal of Economic Perspectives, the authors (Greenwald and Stiglitz, King, Mankiw, Romer, and Tobin) disagree as to the essence of Keynesianism. But this is not the key issue. At this point in the lecture series, I believe it is important to present some sort of summary statement of Keynesian macroeconomics to help the students gain a sense of why Keynesians have traditionally viewed the benchmark labor-market model of lectures 1 and 2 with a jaundiced eye. In lecture 5, I expand upon this definition when I develop the modern new Keynesian response to new classical thought.

7. The instructor may want to discuss here the modern U.S. labor market and the nature of a typical long-term contract between a firm and a worker, if this material has not already been covered.

8. I do not believe it is necessary at this point to develop the rationale for this assumption. In my experience, doing so is likely to lead the students away from the central points that I believe they should take away from this lecture. Other instructors may wish, however, to take time to discuss the hypothesized pattern of imperfect information.

9. To set the stage for the rest of this lecture, the instructor should point out that the labor-demand and labor-supply functions are anchored in (W, N) space not by the actual P but by the P that the firms and workers, respectively, believe to prevail. If the firms and workers are correct in their estimates of P, then full employment prevails, as in the benchmark model of lectures 1 and 2.

10. The business cycle thus represents the efficient response of the economy to changes in underlying real variables. RBC theorists offer an interpretation of the business cycle that is qualitatively different from those provided by old Keynesians, new Keynesians, and the earlier new classicals. I believe this point should be emphasized in class. I do not believe, however, that it is necessary to extend the classroom discussion of RBC theory here by focusing on its characterization of unemployment as voluntary and the role that a high elasticity of labor supply

with respect to temporary changes in real wages plays in propagating a business cycle. The instructor who uses this lecture series as a prelude to a more complete discussion of new classical thought will naturally come to these topics. On the other hand, the instructor who teaches a course centered around modern new Keynesianism need only focus on what is done here to draw out for the students the essential points of contrast between RBC theory and modern Keynesian macroeconomics.

11. The questions my students ask when I work through this approach tend to focus on the rationale behind the assumption that workers have more trouble than firms at uncovering what is happening to the price level when unexpected fluctuations in DRAD buffet the economy.

12. More accurately, modern new Keynesians embed rational expectations into their models. These analysts, therefore, attempt to show how a business cycle can arise and persist even in the absence of price-level misperceptions. In the framework employed here, this point can be translated into the assumption of full and perfect information concerning P, without loss of generality.

13. Given the richness of modem new Keynesian analysis, with its focus on the interactions between heterogeneous agents in a setting that differs significantly from that of perfect competition and the coordination difficulties inherent in an economy populated by price- and wage-setting agents scattered across thousands of markets (which give rise to the possibility of multiple macroeconomic equilibria), it is impossible in such a simple labor-market model to develop a complete analysis of the modern new Keynesian business cycle. Some new Keynesians might even criticize me for making use of something that looks very much like the representative agent framework of the new classicals. My goal is simply to illustrate the essential differences between modem new Keynesianism and the previously discussed schools of thought, which can be done in the given labor-market framework. Instructors who use this lecture series to pull the students into a more complete development of modem new Keynesian thought will naturally move beyond the framework used here.

14. The efficiency-wage literature is replete with arguments for this functional relationship. Two that are likely to make sense to students on an intuitive level (especially if many of them hold jobs outside of class) are the gift exchange motive (Akerlof 1982) and the moral hazard problem that arises because it is costly for an employer to monitor work effort (and to prevent shirking). The instructor, of course, is free to develop the presentation of efficiency wages as he or she sees fit.

15. Should the relationship between effort and the real wage change (i.e., should the effort curve shift), the efficiency wage will adjust, and the marginal product of labor will be different at all levels of employment. Thus the labor-demand-function in (W, N) space will shift. I follow Abel and Bernanke (1995) here and include e* as an argument in the labor-demand function, to reflect this complication.

16. This analysis is open to the criticism that the rigidity of the real wage does not, in and of itself, explain the resulting nominal rigidity highlighted here. I do not believe that it is necessary to address this issue to get the key points of this example across to the students. I refer the

interested (or concerned) instructor to Gordon (1990 and 1993), where this issue is dealt with explicitly.

17. The term menu cost comes from the early modeling in this tradition, which used the costs of reprinting menus by a restaurant as an example of the costliness of price adjustment.

18. The instructor who has been exposed to disequilibrium macroeconomics, or non-Walrasian macroeconomics (pioneered by, e.g., Clower [1965], and Barro and Grossman [1971], and refined over the years by Benassy [1986] and others) will realize that a more precise way to analyze this situation is via the distinction between notional (or voluntary) and effective labor demand and supply functions. I do not believe that it is necessary to develop such an analysis in the context of this example to get the key lessons across to the students.

The instructor should, however, be careful when selecting a textbook. Gordon (1993) is the only intermediate textbook I am aware of that develops the effective/notional distinction relatively fully. Abel and Bernanke (1995) discuss the concept of effective labor demand in the face of an output constraint, but they make their key points without a more complete analysis. Mankiw (1994) avoids the topic altogether and talks only briefly about how the labor demand function shifts in response to output movements in a sticky-price macro model, a presentation that is, at the least, imprecise.

Furthermore, some instructors may object to my combined efficiency-wage/menu-cost example, for menu-cost analysis in and of itself is not concerned directly with the labor market but only with the product market. Thus some menu-cost models posit perfectly flexible nominal wages and derive the business cycle on the basis of the product-market imperfection alone. Doing this generates a result that appears decidedly non-Keynesian to some: in recessions, all unemployment is voluntary. In my attempt to capture the essence of modern new Keynesianism, therefore, I combine efficiency wages and menu costs to generate a recession, caused by a decline in DRAD, that is characterized by involuntary unemployment.

REFERENCES

Abel, A. B., and B. Bernanke. 1995. Macroeconomics, 2d ed. Reading, Mass.: Addison-Wesley.

Akerlof, G. 1982. Labor contracts as partial gift exchange. Quarterly Journal of Economics 97:543-69.

Baily, M. N., and P. Friedman. 1995. Macroeconomics, financial markets, and the international sector, 2d ed. Chicago, Ill.: Richard D. Irwin.

Barro, R. J., and H. I. Grossman. 1971. A general disequilibrium model of income and employment. American Economic Review 61:82-93.

Benassy, J-P. 1986. Macroeconomics: An introduction to the non-Walrasian approach. New York: Academic Press.

Clower, R. W. 1965. The Keynesian counterrevolution: A theoretical appraisal. In The theory of interest rates, ed. F. Brechling and F. Hahn. London: Macmillan.

Dornbusch, R., and S. Fischer. 1994. Macroeconomics, 6th ed. New York: McGraw-Hill.

Gordon, R. J. 1990. What is new-Keynesian macroeconomics? Journal of Economic Literature 28 (3): 1115-71.

-----. 1993. Macroeconomics, 6th ed. New York: HarperCollins.

Greenwald, B., and J. Stiglitz. 1993. New and old Keynesians. Journal of Economic Perspectives 7 (1): 23-44.

King, R. G. 1993. Will the new Keynesian macroeconomics resurrect the IS-LM model? Journal of Economic Perspectives 7 (1): 67-82.

Mankiw, N. G. 1993. Symposium on Keynesian economics today. Journal of Economic Perspectives 7(1): 3-4.

-----. 1994. Macroeconomics, 2d ed. New York: Worth Publishers.

Romer, D. 1993. The new Keynesian synthesis. Journal of Economic Perspectives 7 (1): 5-22.

Tobin, J. 1993. Price flexibility and output stability: An old Keynesian view. Journal of Economic Perspectives 7 (1): 45-65.