CHAPTER EIGHT  MACROECONOMIC FLUCTUATIONS

8.1 Introduction

The previous five chapters have developed and applied a basic aggregate model of macroeconomic activity. Though associated with the work of John Maynard Keynes, this analytical framework can also be thought of as a modification of the simpler Classical model of Chapter Two. It drops the demand-side assumption of constant velocity of money and adds a supply-side assumption of fixed prices and variable output in the short run. Much of our time was spent learning and applying the somewhat intricate demand-side interactions (such as the "multiplier" and "crowding out") embodied in the IS-LM model of aggregate demand. Little attention was paid to aggregate supply as we simply asserted the existence of a horizontal "short run" supply curve that becomes vertical as markets clear in the "long run". We made no attempt to be specific about the duration of these short and long runs.

But even with such a rudimentary treatment of supply, the resulting AD/AS model has proved to be a very useful tool for understanding many macroeconomic essentials such as fiscal policy, government deficits, and the national debt; monetary policy, interest rates, and inflation; and international trade, exchange rates, and trade deficits (major topics of Chapters Five through Seven, respectively). Where the basic AD/AS model is least helpful is, ironically, on the very issues that inspired its development—unemployment and recession. We have portrayed changing levels of real output (and, implicitly, unemployment) as an initial shift of aggregate demand along a horizontal short run aggregate supply curve. This was then followed by a long run movement along aggregate demand as the price level adjusted to restore full employment. This model shows how a drop in aggregate demand, private or public, might trigger a recession or even a depression. That's a good start, but it falls short by failing to explore the nature of the path that leads from short to long run. Put another way, our current framework leaves the process of market clearing—how much? how fast?—unexplained. Therefore it offers no insights into the crucial issue of "timing" that lies at the heart of macroeconomic fluctuations. Lacking such knowledge we are unable to understand the circumstances under which counter-cyclical stabilization policies may be effective, ineffective, or even harmful to the macroeconomy.

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1 There are some issues, like economic growth, for which the AD/AS framework is not particularly useful. It's also true that most current macroeconomic research is done outside the confines of this model with more complex dynamic models. This has led some economists to argue that this approach has outlived its usefulness and should be abandoned. But what will we replace it with? Advanced theoretical models are accessible only to specialists and are often far removed from practical applications. They have little to offer the household, business, or government decision-maker looking for guidance on the likely outcomes of alternative choices. We've seen that the basic Classical model, while relatively simple, is of limited help because its preoccupation with the long run excludes important short run events and issues. Many alternative models have been devised but usually turn out to be just minor variations on AD/AS—old wine in new bottles. The IS/LM-AD/AS framework endures because it's a useful way to present basic macroeconomic interactions within a consistent, manageable framework. It is also extremely flexible and can usually encompass the latest events and newest research findings. As you'll see in this chapter, the AD/AS model is not a single theory representing a particular policy point of view. It's more like a bazaar or a town meeting where theories from all over can come together to display their wares and interact with one another.
Before we remedy this analytical shortcoming, let's take a brief look at the actual fluctuations in economic activity in the U.S., shown in Figures 8.1-8.3. The first graph shows real output over the past century. Its most obvious feature is not the year-to-year fluctuations in production, but the tremendous long term growth in annual output. This is an important fact to keep in mind. While periodic recessions have certainly imposed real hardships on many people, the upward trend shows that they came in a world that was steadily, if not smoothly, becoming increasingly prosperous. The turbulence on the surface is dwarfed by the rising tide of prosperity upon which it rides.

![Figure 8.1](U.S. Real Output, 1890-2003 (Billions of 1998$))

Even though growth may be the most significant economic story in the U.S. over the past two centuries, the most dramatic story is the year-to-year variability of this growth. Figure 8.2 plots the annual rates of output growth since 1890 and essentially zooms in on the "noise" along the surface of the first picture. Instead of the level of real output, we now see the annual percentage changes in that level (%Δy). The 3.4% average growth rate of real output over this period now shows up as a horizontal line, rather than as the upward sweep of Figure 8.1. Fluctuations around this line reveal the variability of economic growth. Negative growth rates show the recessionary periods when living standards were actually declining. Figure 8.3 offers another view of macroeconomic activity by looking at the unemployment rate. Although output and employment fluctuations are often termed "business cycle", it is quite apparent that the ups-and-downs do not occur at evenly measured, easily predicted intervals. It is this unevenness and irregularity that presents the biggest obstacle to attempts to "smooth" economic fluctuations with counter-cyclical policies.

To begin to understand the nature and causes of these economic fluctuations we must expand our analytical framework to accommodate the main features of the adjustment process that links short to long run. It should be understood that we are now asking a much more ambitious set of questions than before. Our concern is no longer with the equilibrium levels of key variables, but with the equilibrium rates of change of those levels. Such a dynamic analysis quickly becomes very complex and calls for advanced analytical tools that lie beyond the scope of this course. Hence this presentation must focus on conceptual basics, laying a broad and
intuitive foundation for a practical understanding of the main areas of agreement and disagreement in this area of "short run dynamics". References are given throughout the chapter for those who are willing and able to pursue these issues at a more technically advanced level.

Figure 8.2

A brief preview should prove helpful. The goal of this chapter is to help you gain a practical understanding of: (1) the main causes of fluctuations in output and employment, (2) the nature of the market-clearing forces pulling the economy back toward full employment and, especially, the various frictions that act as sources of resistance, and (3) the circumstances under which monetary or fiscal responses can be expected to quicken the return to full employment. The notion that "frictions" can account for the economy's failure to return quickly to full employment is certainly plausible and hardly new. But until we put some
precision and substance into this metaphor, it can offer us a vocabulary but little insight. So this chapter begins the analysis of "frictions" in three key areas—the perceptions and expectations of decision-makers, the wage and price-setting choices of firms, and the formulation and implementation of policy. This is a highly controversial area and the "gray area" of honest disagreement is substantial. So part of the challenge lies in not being too quick to surrender to simple explanations of complex events.

8.2 The Role of Expectations in Economic Fluctuations

We begin with an ingredient common to all modern explanations of economic fluctuations—the influence of expectations on individual decision-making and, thereby, on macroeconomic performance. The premise is the obvious one that our current choices are made on the basis of some expectation of their future consequences. These expectations incorporate our perceptions of cause-and-effect connections in the macroeconomy as well as our anticipations of coming events and policies. Such a potential role for expectations was certainly not excluded from our previous analysis. But it was left implicit, treated as an outside and occasional factor. We now incorporate these important but elusive ingredients—uncertainty, expectations, and misperceptions—as systematic and integral parts of our analysis.

Of the many different avenues through which expectations can and do affect our economic choices, we will focus on just one—the expected price level \( \text{Pe} \). This simplifies things immensely yet still yields results similar to those of more elaborate expectations-oriented models. Instead of beginning with a particular theory or hypothesis, let's start from an empirical observation. Statistical studies seem to find a significant relationship between unexpected changes in the price level and the level of real output. Specifically, real output is observed to increase when the price level rises above its expected level and to fall when the price level is unexpectedly low. Without speculating just yet on what this might reflect, let's explore its implications by expressing it in equation and graph form. This relationship is known as the expectations-augmented aggregate supply curve, denoted by \( \text{AS}^e \), and written as:

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y = y^* + \beta(P-P^e),
\]

\( \text{AS}^e \) Equation

where \( y^* = F(n^*,k,tn,\text{inst}) \) defines full employment as before, the parameter \( \beta \) is a positive constant, and the "expectations gap" \( (P-P^e) \) is a measure of the accuracy of our price level information.

Suppose, to begin, that the actual and expected price level are the same, that is \( P = P^e \). This makes the last term in the \( \text{AS}^e \) equation equal to zero, so that actual real output will equal its full employment, market-clearing level, i.e., \( y = y^* \). While this is basically the same long run vertical aggregate supply relationship we've been using all along, there is an important difference. In saying that it holds only for the case of "perfect information" \( (P=P^e) \) we've finally put some substance into the meaning of "long run". In a long run in which price expectations are up-to-date and accurate, the graph of the \( \text{AS}^e \) equation becomes the familiar vertical \( \text{AS}^* \) curve in Figure 8.4.

But the real importance of the \( \text{AS}^e \) model lies in what it tells us about short run situations in which expected and actual price levels can differ. To see the role that these misperceptions (i.e., \( P \neq P^e \)) can play, suppose the economy is initially in long run equilibrium at point A in the graph when an unexpected event causes the actual price level to rise suddenly to \( 2P_0 \), leaving...
expectations temporarily stranded at P* = P₀.² It takes time, perhaps a number of months, before our experience with changing individual prices combined with the government’s collection and gradual release of preliminary and then revised data on prices provides the necessary information to reformulate perceptions and anticipations. In terms of this new supply equation—
y = y* + β(P - P*)—the lag in the adjustment of expectations to changes in the price level creates a positive short run gap so that (P - P*) > 0. Since y* is fixed, this increase in the right hand side of the equation must be a +Δy on the left hand side as real output rises above its long run full employment level. So this unanticipated increase in the price level (+ΔP) has meant a rise in real output (+Δy), shown as the movement from A to A’ in Figure 8.4.³ By the same reasoning, should the price level unexpectedly decline to ½P₀ then (P - P*) would be negative and output would fall below its full employment level as shown by the movement from A to A”.

The three points A, A’, and A” show three different combinations of the actual price level (P) and the supply of output (y). But they have an important common characteristic—by assumption, the expected price level is the same (P* = P₀) at each point. We represent this by connecting the points with a short run aggregate supply curve, defined for the given expected price level of P₀ and denoted by ASₜ(P* = P₀). If we think of the long run AS curve as defined by perfect information (P* = P for all values of P), then the short run ASₜ(P* = P₀) curve is defined

²The implicit downward-sloping aggregate demand curve intersecting AS at this point has been left out simply to keep this first graph as clean and clear as possible. The relationships underlying aggregate demand (embodied in the IS-LM model) are, of course, essential to any complete explanation of output and the price level.

³The size of the increase in y in response to the given +Δ(P - P*) depends on the size of the coefficient β. The larger is β the further to the right A’ will be and the shallower the slope of the line connecting points A and A’ will be. We assume that β is a constant whose value can be determined statistically.
by the presence of fixed expectations (at $P_0$). If these expectations are correct then the economy is on both the short and long run curve at point A. But if expectations are too low ($P>P^*=P_0$) we’ll be on the short run curve to the northeast of point A with $y>y^*$. Similarly, when expectations are too high ($P<P^*=P_0$) we’ll be to the southwest of A. To summarize, changes in the actual price level when the expected price level is constant, show up as a movement along a short run $AS^e$ curve.

What happens as price expectations adjust to the new circumstances? In terms of the $AS^e$ equation, the value of $(P-P^e)$ goes to zero and the economy returns to full employment ($y=y^*$). That is, we return to a point of long run perfect information on the vertical $AS^e$ curve. As shown in Figure 8.4, an unexpected increase in the actual price level ($\Delta P$) initially moved us from A to A’. Assuming the price level remains at this higher level, as expectations adjust ($P^e\to 2P_0$) we move from point A’ back to $AS^e$ at point B. We will now be on a new short run aggregate supply curve, $AS^{SR}(P^e=2P_0)$, intersecting the long run curve at a higher price level but otherwise having the same characteristics as the initial short run curve. Figure 8.4 thus illustrates the two main features of the expectations-augmented supply curve: (1) with fixed expectations, a change in the price level results in a movement along the given short run aggregate supply curve, but (2) as price expectations adjust to the actual price level, the entire short run relationship shifts.\footnote{The single equation underlying our expectations-augmented aggregate supply curve—$y=y^*+\beta(P-P^e)$—actually becomes a whole “family” of different curves when graphed. This is because it has three unknowns ($y$, $P$, and $P^e$) and when we graph it in two dimensions ($y$ and $P$), the third variable—price level expectations—ends up in the intercept term, serving as a “shifter”.}
Combining these supply-side expectations with the familiar IS-LM model of aggregate demand alters the implications of our previous AD/AS model in two important ways. The first can be seen in Figure 8.5, which traces the impact of a given increase in aggregate demand with and without the influence of price expectations. The short run impact of an increase in AD now shows up partly in real output and partly in the price level (A to A' in Fig. 8.5). This is in contrast to the movement from A to H when we previously assumed a fixed short run price level. This partial price adjustment, resulting from the upward tilt of the new short run supply curve, offers a more realistic portrayal of observed short run adjustments in the macroeconomy.

The second major difference is that although both models end up at exactly the same long run position (point Z in the graph), the expectations-augmented approach offers an explanation for the adjustment from short to long run that is completely absent in the original model. Turning to Figure 8.6, we find that the given increase in aggregate demand moves us from A to A', the price level rising to P₁ while price expectations lag behind at P₀. The subsequent path linking short to long run (A' to B' to C' and on to Z) can now be explained as a process in which expectations respond to the changes in the actual price level.

To take a simple example, suppose there is a one month lag between changes in P and changes in Pₑ. (Perhaps it takes this long to collect and analyze the official price data, so that today’s expectations are always equal to last month’s actual prices.) Following the initial short run movement to A' in response to the increased aggregate demand (Figure 8.6), the economy will then move to B' in the following month as price expectations adjust and ASₘₗ(Pₑ=P₀) shifts upward to ASₘₗ(Pₑ=P₁). This brings about a subsequent increase in the price level to P₂ which,

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5This increase in aggregate demand must, of course, have originated in an outward shift in either IS or LM. To keep the focus on the supply side for now, the IS-LM graph underlying the AD curve has not been drawn.
when perceived a month later, will shift $AS_{SR}(P^e=P_1)$ to $AS_{SR}(P^e=P_2)$ causing the actual price level to rise to $P_3$ at point $C'$. This ongoing upward shift of short run supply along $AD'$ continues until expected and actual price levels are again equal at point $Z$ with the economy back on its long run aggregate supply curve.

**IN SUMMARY . . . ADDING EXPECTATIONS TO THE MODEL**

Expectations can be incorporated into our analysis with just one new variable, the expected price level ($P^e$), added to one relationship, aggregate supply. The resulting expectations-augmented aggregate supply curve ($AS^e$) -- $y^e = y + \beta (P - P^e)$ -- tells a story of how an unexpected change in the price level initially causes real output to move along an upward-sloping short run aggregate supply curve (A to $A'$ in Figure 8.6). Then as the initial misperception is corrected over time, short run supply shifts along the aggregate demand curve ($A'$ to $B'$ and so on) until equilibrium real output reaches its long run, full employment level.

Inherent in this AD/AS$^e$ model is a redefinition of short and long run. "Short run" is now characterized by a fixed level of price expectations rather than by the fixed price level of the earlier model. "Long run" is the condition of equality of actual and expected price levels, in contrast to the undefined "market clearing" of the earlier model.

The AD/AS$^e$ model offers both a more realistic description of the short run (in which both $P$ and $y$ adjust) and a mechanism to explain the adjustment from short to long run equilibrium. In the process, it provides a theory of economic fluctuations in which deviations of output from full employment arise when unanticipated shifts in aggregate demand create misinformation about prices. This misinformation leads us to decisions which ultimately cause real output to depart from its full employment level. Our misperceptions essentially act as a friction that keeps us away from full employment. Whether this friction is short-lived or prolonged depends, in this view, on the speed at which expectations adapt to changing conditions.

8.3 Expectations—*Why* They Matter

The full expectations-augmented model, AD/AS$^e$, connects output fluctuations to price level misperceptions resulting from unexpected changes in aggregate demand. Recovery from recession is entirely a process of correcting our expectations—the more quickly they adjust, the shorter the downturn. In attributing so much power to expectations and misperceptions, this is clearly a strong and ambitious hypothesis. To assess how reliable and useful it is as a theory of the business cycle, we must address two key questions: What is the underlying logic that leads us to believe that expectations are so strongly linked to real output? Can we find hard evidence to support such a view?

We begin with the issue of *why* expectations matter. So far we have justified adding them to the model only with an assertion that this seems to be consistent with empirical observations and statistical tests. But statistical regularities in economics, as elsewhere, have sometimes turned out to be short-lived or even illusory. (We'll see a classic example of this in next chapter's discussion of the Phillips Curve.) So before we put too much weight on the apparent facts, let's ask whether there are some good commonsense, cause-and-effect reasons to support the hypothesis that price level misperceptions, reflecting frictions in the adjustment of
price level expectations, keep us from full employment. Could something as intangible and changeable as expectations really be responsible for something as big and real and persistent as a recession?

Much attention has been devoted to this question over many years. Modern views stem largely from the independent studies done by Milton Friedman and Edmund Phelps in the late 1960s, soon followed by a series of important theoretical and statistical contributions by many economists, most notably Robert Lucas. From this sizable literature has emerged a number of plausible linkages between price level misperceptions and economic fluctuations. All require us to go behind the expectations-augmented aggregate supply curve (AS) to look at its underlying "microfoundations."

To establish a connection between expectations and economic fluctuations, we begin with uncertainty -- a fact of life largely ignored in previous chapters. No one, of course, can know the future. Even the most astute and careful predictions will almost always be a little off and will sometimes be far from the mark. And sometimes even our most casual hunches or wildest guesses will come to pass. It turns out that the inevitable uncertainty of everyday life, combined with delays in obtaining and reacting to new information, can lead us to individual choices that collectively mean systematic fluctuations in macroeconomic performance. Do you take the first job offer that comes along after graduation or keep searching for something better? Should a company raise the price of its product in the wake of an unexpected increase in sales? In the midst of a downturn, should you take advantage of bargain prices to buy a new car or reduce your spending until the clouds of recession have receded a bit further? Such choices—involving uncertainty and affecting many decision-makers—have the cumulative potential to create an economy-wide surge or lull in economic activity.

We'll examine two specific ways in which this can happen. Both involve choices based on a temporary misperception of the level of prices—one by workers, distorting their labor supply decision; the other by businesses, distorting their output decision. Let's start with the worker misperception hypothesis which focuses on decisions in the labor market. Figure 8.7 pictures the labor market of an economy initially at full employment equilibrium at point A. Suppose a sudden increase in aggregate demand (not pictured) causes the price level to double, thereby reducing the real wage from \( W_0/P_0 \) to \( W_0/2P_0 \).

If we presume (as we did in deriving the Classical model back in Chapter Two) that both labor suppliers and demanders are fully aware of this price change, they will respond by moving down their labor market curves to points S and D, respectively. The result is a labor shortage.

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7 The term "microfoundations" is used in a general sense here to denote the process of constructing a richer, more detailed analysis than is provided by the highly aggregative AD/AS framework. Sometimes "microfoundations" is given a narrower meaning that refers to the use of microeconomic models of consumer and firm behavior to build an aggregate model that presumes constant market clearing. This book does not impose such a strong assumption. For a careful development of that approach see Robert J. Barro, *Macroeconomics*, Fourth edition (New York: John Wiley & Sons, 1993) or George T. McCandless Jr. with Neil Wallace, *Introduction to Dynamic Macroeconomic Theory: An Overlapping Generations Approach*, (Cambridge, Mass: Harvard University Press, 1991).
shown by the gap between labor demand and supply curves at $W_0/2P_0$. Basic market mechanics tell us that this shortage will put upward pressure on the nominal wage until the labor market has returned to equilibrium at point A with both prices and wages doubled. The equilibrium levels of the real wage, employment, and real output are unaffected by the outward shift in aggregate demand. This familiar result underlies the vertical AS$^*$ curve that we saw first in the Classical model and then again as the long run result of the Keynesian AD/AS model. But we now stress the point that this is a "perfect information" outcome ($P=P^*$), based on the presumption that both suppliers and demanders of labor are fully aware of the price level change.

Let's change this slightly by supposing that the sudden increase in aggregate demand and resulting doubling of the price level is initially perceived by labor demanders but not by labor suppliers. According to the "worker misperception" hypothesis, such asymmetrical information is likely since firms have more resources and more incentive to keep in touch with economic events than do individual workers. While workers will see individual price increases at the stores, it takes time—perhaps many months—to determine whether this is an economy-wide trend in the price level rather than just the ever-present ups and downs of various individual prices as markets adjust to constantly changing economic conditions.

If workers had spotted this increase in the price level, they would have realized that it meant a reduction in their real wage and would have moved down their labor supply curve as shown in Figure 8.7 (point A to S). But failing to recognize the rising price level and falling real wage, they now base their labor supply decision on a misperceived higher real wage. They think the real wage is at $W_0/P_0$ so they continue to supply $n^*$ hours of labor, believing they're at

![Figure 8.7 Perfect Information Model of the Labor Market](image)

*Figure 8.7 Perfect Information Model of the Labor Market*

*A doubling of the price level initially creates a labor shortage, forcing a proportional rise in the nominal wage and returning the economy to full-employment equilibrium at point A.*
point A on \( n^s \) in Figure 8.8. In reality, the doubled price level means that they are actually at point M in the graph. If they knew their real wage was lower they would have moved down \( n^s \) as in Figure 8.7. Lacking that knowledge, they continue to supply the same amount of labor at the lower real wage, effectively causing the labor supply curve to shift out to \( n^s' \).

Putting the pieces together, the "worker misperception" hypothesis argues that a sudden increase in the price level is likely to be seen more quickly by firms than by workers. So while the rising price level and falling real wage will cause firms to move along their (perfect information) \( n^d \) curve, the misperceptions of workers cause their labor supply curve to shift to the right. The net result will be a new equilibrium in the labor market at the intersection of \( n^s \) and \( n^d \) shown at point A'. Instead of the equilibrium real wage and employment remaining constant as in the perfect information case, the new equilibrium now brings a lower real wage (\( W_0/P_0 \) to \( W_1/P_1 \)) and increased employment.

As long as this price misperception lasts, the economy will find itself producing at point A' in Figures 8.6 and 8.8, well beyond its perfect information, full employment level.\(^8\) Then as workers' expectations adjust to the changed situation, the labor supply curve moves back toward the perfect information \( n^s \) curve and the short run aggregate supply curve shifts up, returning the economy to full employment at the higher price level. The adjustment process from short to long run that we saw in Figure 8.6 as the movement from A' to B' and so on back to Z is a reflection of initial price level misperceptions being corrected over time. So the "worker

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\(^8\) By similar reasoning, an unexpected -\( \Delta P \) would lead to a decrease in the supply of labor, causing equilibrium employment and real output to fall below their full employment (perfect information) levels.
misperception” hypothesis tells a more-or-less plausible story of why expectations matter and one that is fully consistent with the expectations-augmented aggregate supply curve—\( y = y^* + \beta (P - P^e) \).

A second rationale for AS\(^e\) stays with the output market rather than the labor market and avoids the strong assumption that businesses always have perfect information while workers do not. According to the firm misperception hypothesis an unexpected change in the price level causes confusion as to the meaning of the individual price increases that make up the change in the overall price level. This approach suggests that when a particular firm observes a sudden change in market conditions, it won’t know at first whether this reflects a change in the demand for its product relative to others or whether it merely means an increased demand for output throughout the whole economy, leaving the real demand unchanged.\(^9\) If the increased demand is thought to be specific to its product, a profit-maximizing firm will increase its production through overtime work, hiring new workers, or even expanding its facilities. But if it is perceived as an economy-wide increase in nominal demand rather than a switch in favor of their particular product, the firm would not want to increase production levels since the relative price of its product hasn’t changed.

Returning to our example of an unexpected increase in aggregate demand, it is likely that a number of firms will initially misread the rising price level as an increase in their particular product price relative to others. They will respond by increasing their production levels. So the increased aggregate demand will not merely push up prices but, due to firms' misperceptions, also lead to increased output. This shows up as a movement along the short run expectations-augmented aggregate supply curve (A to A' in Figure 8.6). As firms discover that the rising prices do not reflect increased demand specific to their product, production will be returned to its original level. In the aggregate, these diminishing misperceptions will show up as a series of shifts of the short run aggregate supply (A' to B' etc. to Z) as the economy moves back to its long run, perfect information aggregate supply curve (AS\(^e\)) at the new higher price level.

Combining the potential for worker misperceptions of real wages and firm misperceptions of relative prices, we have an underlying rationale (based on the microfoundations of individual and firm behavior under uncertainty) that is consistent with the implications of the aggregate expectations-augmented supply model—\( y = y^* + \beta (P - P^e) \). Deviations from full employment reflect a combination of change and uncertainty. An unexpected shift in AD creates short run misperceptions on the part of decision-makers that lead to employment and output choices that are not market-clearing. The subsequent adjustment to the vertical long run aggregate supply curve mirrors the adjustment of worker and firm expectations (and the labor and output decisions based on them) to the new conditions.

Having found some plausible explanations for why expectations and misperceptions might be systematically related to departures from full employment, we must now address the question of whether the factual evidence supports the strong contention of the "misperceptions"

\(^9\)The model underlying this hypothesis was first developed by Robert Lucas in a series of influential articles collected in his *Studies in Business-Cycle Theory* (Cambridge, Mass: The MIT Press, 1981).
model (embodied in AD/AS) that fluctuations in real output and employment are due primarily to unexpected shifts in aggregate demand followed by the gradual correction of initial misperceptions.

### 8.4 Expectations—How They Change

Let's change metaphors for the moment, trading the useful but drab equations and graphs of an "equilibrium system" for the more vivid setting of a "criminal case". Our investigation has turned up a pattern of behavior (misperceptions) and two suspects (workers and firms) accused of being the perpetrators of the business cycle. But the evidence to this point is largely anecdotal. It's obvious that the existence of uncertainty and change ensures that our expectations will sometimes be wrong, leading us to make some choices that we would otherwise not have made. It's also apparent that after the initial surprise of an unexpected event, we collect and evaluate the new information and sometimes reverse past choices. But can this, even when magnified over millions of decision-makers, really account for the ups and downs of the business cycle? Is the **timing** as well as the **magnitude** of these misperceptions consistent with the observed fluctuations of output and employment?

Can we find the hard evidence to back up our suspicion that changing misperceptions of decision-makers (±Δ(P-P_e)) are guilty of causing ongoing fluctuations in real output (±Δy)? Thanks to the efforts of national income statisticians, it's quite easy to account for past movements of real output (y) and the price level (P).\(^{10}\) We can turn to official statistics, readily available from many private and public sources in a variety of formats, including disk, CD ROM, on-line via modem, and the traditional hard copy. But, unfortunately, one vital piece of information—the **expected** price level (P_e)—is not to be found in the official measures. Without this data we're unable to reconstruct the past movements of price level misperceptions (P-P_e). If we can't tell whether or not they were at the scene of the crime, then we can't reach a verdict on the AD/AS\(^{10}\) theory of the business cycle.

Rather than abandon every hypothesis incorporating expectations as untestable, we must look elsewhere for the missing empirical evidence on price expectations. The most obvious approach might be to simply ask decision-makers for their expectations through **sample surveys**. Useful as this can be in profiling individuals' attitudes and preferences, it has not turned out to be very helpful in providing reliable information on economic expectations. Experience has shown that answers to survey questions about expectations are extremely sensitive to how the question is worded. The same question put in slightly different contexts, for example, can lead to very different responses. In other words, the witnesses aren't giving the consistent and reliable testimony needed to test our business cycle theory.

Strange as it may sound at first, the solution to this problem of measuring expectations has been to turn to a theory of expectations. By creating a model of how price expectations are

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\(^{10}\)This is not to imply that measures of these variables are without their shortcomings, as will be discussed in Chapter Fifteen. But for many purposes, including studies of the business cycle, the standard measures are accurate enough to discriminate among major hypotheses.
formed and what causes them to change, we are able to generate the data that we're not able to measure directly. Put another way, we can get an indirect measure of our unobservable variable if we can establish a cause-and-effect linkage between it and related but observable variables. This may seem like a highly contrived and artificial attempt to avoid having to give up on our expectations-oriented theories. But it's actually a quite common procedure and one that most of us use in a variety of different situations. Consciously or not, we often make projections from observables to unobservables. Sometimes this is done in a simple, almost instinctive way. Other times we apply more complex means. For example, we make inferences from observables to unobservables in virtually every forecast we make. Whether it's about future interest rates, end of semester grades, or the best choice of a career or spouse, we use what we can learn from the past and present to imagine the future. When we make a decision in the present, it is frequently based, at least in part, on a projection to the future. It seems safe to presume that the individuals and firms making labor supply and production decisions in our AS* model are not just plucking their price (and other) expectations out of thin air. Knowing that poor choices will lower their standard of living, they will base their perceptions and forecasts on what they see and hear.

So our strategy for obtaining the necessary evidence to evaluate the misperceptions theory of the business cycle is to add a theory of the formation of price expectations to our AD/AS* framework. In so doing we essentially generate the missing information (P_e) needed to create a measure of price level misperceptions (P - P_e). This in turn will allow us to put the expectations-augmented aggregate supply hypothesis—y = y' + β(P - P_e)—to the test. Do the facts support this view that price level misperceptions are the primary cause of macroeconomic fluctuations? If not, how can we supplement the model to get a better explanation of the business cycle?

Let's begin with a very basic and easily implemented model of expectations, one that extrapolates future values of a variable from its own past and present values. This general procedure, within which there could be many variations, falls under the broad heading of the Adaptive Expectations Hypothesis (AEH). Applied to price level expectations, it says that as updated information on the actual price level becomes available, our expectations—inferences from observed to unobserved—adjust accordingly. To take the simplest example, suppose we forecast next month's price level with the assumption that it will equal this month's. We can write this as:

\[ P_{e,t+1} = P_t \]

where t represents the current time period (a month, in this case) and t+1 is the next period. If this simple model (or "rule of thumb") captures the way we formulate our expectations, then forecasts of next month's price level will always adapt to the latest information as "t" moves from January to February to March and "t+1" from February to March and so on.

A more elaborate forecast would incorporate more information than just this month's price level. It might go further back in time, perhaps giving diminishing importance to earlier observations. For example, in forecasting next month's price level suppose we suspect that people look back over the last three months. But instead of using a mean value (unweighted average) they might give the current month most importance, with diminishing weights attached to older information. If they gave half the weight to the current month, 30% to last month, and 20% to the prior month, this could be expressed as:
Obviously this is just one of many ways by which we might use past observations on a variable to forecast its future. But instead of exploring variations on the Adaptive Expectations Hypothesis, let's look at it with a more critical eye and note that it represents a process that is inherently **backward-looking**. Expectations, in this approach, adjust only **after-the-fact**, reacting to the past rather than anticipating the future. Put another way, the AEH imposes a substantial amount of "friction" in the adjustment of $P^e$ to changes in $P$. Therefore, using this hypothesis to calculate expectations produces relatively large values for misperceptions ($P - P^e$) and a gap that closes relatively slowly since expectations respond only to past events.

If we're confident that this is a good approximation to the actual, but unobservable, price expectations, then it's a simple and useful way to gather the necessary evidence to take the AD/AS model to court. However there are some good economic reasons to suspect that the simple extrapolations underlying Adaptive Expectations make misperceptions appear more sluggish than they actually are. If so, then it will generate biased evidence that could lead us to the wrong verdict on whether misperceptions are the primary cause of business cycle fluctuations. By making misperceptions look more important than they really are, we may convict the wrong party and let the true perpetrator get away scot free.

Is the Adaptive Expectations Hypothesis a reasonable approximation to the way in which we actually go about forming our expectations? It is sometimes compared to driving a car down the highway while looking only through the rearview mirror. We try to anticipate what lies ahead by looking only at where we've been. Depending on the road, this may occasionally work well but it could also turn out very badly. In refusing to consider the possible impact that other variables and events and policies are likely to have on the price level, the Adaptive Expectations Hypothesis ignores readily available and potentially useful information. This implication that decision-makers knowingly waste a scarce resource makes most economists uncomfortable with the use of the Adaptive Expectations Hypothesis. By forbidding the driver from looking out the side or front window of the car, it essentially ignores all that we have done in previous chapters toward devising an explanation of how real output, interest rates, the price level, the trade deficit and so on are determined. We have emphasized *interconnections* among the many current variables, events, and policies that underlie macroeconomic change. But in the world of Adaptive Expectations this information is, in effect, treated as if it provides no better view of what lies ahead than a simple extrapolation from past to future. So the issue we now address is whether there is a way to overcome the shortcomings of the Adaptive Expectations Hypothesis by formulating a more sophisticated model of expectations that allows decision-makers to use all available information in forming their expectations.

The **Rational Expectations Hypothesis** (REH) starts from the assumption that decision-makers base their choices on a wide array of information about economic events and macroeconomic connections. In forming price level expectations, for example, the Rational Expectations Hypothesis assumes that decision-makers will take into account the rate at which the Federal Reserve has been increasing the money supply in recent months, as well as any major changes in fiscal policy, supply shocks, or other events that may be on the horizon. In short, the REH is based on the presumption that people try to "optimize"—do the best they can with what they've got. So they base important decisions not only on a variable's own past (as presumed by the AEH), but also on current and expected future events. And since these events don't "speak for themselves", the rational expectations hypothesis further assumes that...
decision-makers combine this information within a cause-and-effect framework (e.g., the AD/AS macroeconomic model) to generate price and other important expectations that will help them make better choices in a changing and uncertain world.

The Rational Expectations Hypothesis is obviously a much more sophisticated and ambitious way to generate expectations data than is the Adaptive Expectations Hypothesis. While this makes it more appealing in some ways—namely, that it doesn't imply that we ignore useful information—it also makes it far more difficult to use. The result has been the creation, over the past 25 years, of virtually a new industry within the field of macroeconomics, devoted to exploring the theoretical and statistical characteristics of alternative ways of incorporating expectations into macroeconomic models.

This "expectations revolution" in macroeconomics has brought forth a great deal of ingenuity, hard work, and sharp disagreement among a good number of the best and brightest economists. Connecting the AD/AS framework of Edmund Phelps and Milton Friedman (cited earlier) with the pioneering work on expectations by Philip Cagan (1956) and, especially, John Muth (1961), a group of young economists in the 1970s began a serious exploration of how price-level expectations can be incorporated into macroeconomic models. Robert Lucas, Thomas Sargent, Neil Wallace, Christopher Sims, Robert Barro, Bennett McCallum, Finn Kydland, and Edward Prescott, among others, were particularly important in formulating what was initially known as the "Rational Expectations School".

This intense exploration of expectations seemed to uncover some very unexpected policy implications, quite different from those of standard macroeconomic models. The result was a bitter clash among macroeconomists over the very foundations of the field—What should a theory provide and by what logical criteria should it be judged? and What kinds of empirical and statistical evidence represent a legitimate test of that theory? As you'll see by chapter's end, the Rational Expectations School (like the Keynesian School it was reacting to) now appears much less radical than it once did. This is partly because it has adapted somewhat to its critics but even more because its influence (again like that of the Keynesians) has been incorporated into the mainstream. Rational expectations has had an important impact on the way that most economists view economic fluctuations and stabilization policy. It is a topic that seems destined to become a permanent part of macroeconomic analysis. A recent survey of the field concludes that:

"... Rational expectations has undoubtedly become the standard way of modelling expectations in macroeconomics. Whatever the reason for this dominance, whether it is due to its own theoretical appeal or the absence of any theoretically attractive alternative, it is certainly true that there is hardly a branch of macroeconomic theory in which rational expectations has not been introduced and its implications explored; that its introduction has radically influenced the conduct of applied research in macroeconomics; and that for the moment it appears to have no serious rival."11

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The remainder of the chapter presents a non-technical and practical assessment of current thinking of the implications of expectations for economic fluctuations and stabilization policy.

8.5 Can “Rational Misperceptions” Explain the Business Cycle?

We began this chapter with the confession that our previous AD/AS framework is of limited help in understanding the short run fluctuations in output that constitute the business cycle. We sought to remedy this by introducing "expectations" into the analysis through the expectations-augmented supply curve (AS*)—\( y = y^* + \beta (P - P^e) \). Adding this "price misperception" component to real output (the \( \beta (P - P^e) \) term) gives a descriptively more realistic upward-sloping aggregate supply curve in the short run that shifts over time with changing expectations. Output fluctuations, in this view, are the short run result of unexpected changes in the price level, i.e., \( \pm \Delta (P - P^e) \neq 0 \Rightarrow \pm \Delta y \). How quickly the economy returns to full employment depends entirely on the speed at which these misperceptions disappear.

To make this approach operational requires information on how price expectations adjust to new information. We saw that the initial appeal of the simple and intuitive Adaptive Expectations Hypothesis diminished as the implications of its backward-looking orientation were explored. This led to the so-called Rational Expectations Hypothesis which starts from the common sense presumption that in a world of scarcity important economic decisions will not be made carelessly. With so much available information (and a framework in which to analyze it—the AD/AS* model), it would be surprising if the actual manner in which we form our price expectations isn't more "rational" than "adaptive".\(^{12}\) While this may seem obvious for large corporations and financial organizations that can afford to employ economists or economic consultants, it is also likely to apply to ordinary consumers trying to be careful with their money. When the economic stakes are large -- a house and mortgage, a career change, a second job, a retirement plan— many of us use professional advice without even being aware of it. Through newspapers, magazines, books, radio and TV and, increasingly, money management software programs, we have ready access to the latest information, state-of-the-art forecasts, and expert advice at very little cost.

It's important to remember that the Rational Expectations Hypothesis does not mean "perfect information" regarding the consequences of our choices. Omniscience is not the issue here. The REH explicitly acknowledges that as economic conditions change in unforeseen ways, our expectations and perceptions will initially be caught unawares. Unanticipated events create a gap between actual and expected prices and, thereby, between actual and full employment output as described by \( y = y^* + \beta (P - P^e) \). So even the most rational of expectations

\(^{12}\)Of course, even economists don't believe that anyone literally uses these models to calculate precise optimal choices at each moment in time. The actual choice process is clearly a far different and richer blend of calculation, rule-of-thumb, tradition, superstition, and much else. Economics is not trying to provide realistic explanations of why people act the way they do. Instead, we try to get some relatively simple, hence manageable, hypotheses that yield testable implications of the "if ______, then ______" sort. The fact that a particular theory may provide a good description of past behavior and have good predictive power provides us with a crucial stepping stone in our exploration of economic interactions. It does not tell us that people, even economists, literally follow the intentionally simplified hypotheses of our models.
can certainly be wrong and, when they are, the economy moves away from full employment. But rational expectations (looking out all the windows of the car) respond with relatively little delay to end these misperceptions and restore full employment. For convenience, let's nickname this combination of "misperceptions" and "rational expectations" (AD/AS + REH) the rational misperceptions model.13

How useful is this framework as a theory of fluctuations and a guide to countercyclical policy? Certainly its foundations seem plausible. It is widely accepted that misperceptions can play an important part in overall economic instability and the premise that expectations are formed in a "rational" rather than a more restrictive "adaptive" manner is difficult to oppose. But these seemingly plausible assumptions have a strong implication that initially shocked many economists. According to the rational misperceptions model, countercyclical policies are powerless to stabilize the economy. If this model is a reliable guide to the workings of the macroeconomy, then the attempt to use monetary or fiscal policy to speed the return to full employment or smooth the business cycle is simply futile.

Within the logic of the model, this result is straightforward. Since countercyclical policy by its very nature is predictable—expansionary actions in a recessionary downturn, contractionary in an inflationary boom—it will be foreseen and built into expectations. Since any predictable events or policies can have no effect on misperceptions, they will have no impact on real output. The whole notion of countercyclical policy, so ingrained in our thinking since the Great Depression, Keynes, and the Employment Act of 1946 is, according to this model, simply wrong. This implication has come to be known as the policy ineffectiveness proposition.14

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13This is often referred to by economists as the "New Classical" model. As the name implies, it is characterized by relatively rapid market-clearing, making it more akin to the Classical tradition than to a Keynesian world of sticky prices. But on the topic of what's "New" and what's "Classical", the ambitious reader is referred to an excellent presentation by Kevin D. Hoover, The New Classical Macroeconomics: A Sceptical Inquiry (Cambridge: Basil Blackwell, 1988), particularly Part V, The New Classical Methodology. To keep from getting too caught up in the knee-jerk responses that most of us have to words like "Classical" and "Keynesian", we've used the more neutral and more descriptive "rational misperceptions" name.

14This name can be confusing. It certainly does not say that monetary and fiscal policies have no impact whatsoever. They can still alter the price level and interest rates and all the nominal and real variables that respond to these. "Policy ineffectiveness" only means that predictable aggregate demand policies will not alter total real output or employment. They may well alter the composition of these variables as well as the levels of others.
Reaction to this unexpected result was predictable. Those in the Non-activist, small-role-for-government camp, could only be pleased that scientific research seemed to corroborate their views. Many saw this as a long overdue correction to what they believed was an ideological bias that had entered the profession with the advent of activist-oriented "Keynesianism". To this group, "policy ineffectiveness" appeared to be just a modern manifestation of the Classical market-clearing process that keeps the economy at or near full employment without government intervention.

The initial response of most economists to this result, however, was one of disbelief. Those who had long accepted the need for monetary and fiscal changes to offset unwanted fluctuations in economic activity had seen many challenges to this view drop by the wayside over the years. The only one that had endured was Milton Friedman's contention that "long and variable policy lags" could mean that countercyclical policy changes took effect too late to be of help and might sometimes mean added instability in aggregate demand and hence output and employment. Friedman and his Monetarist followers accused the government itself of being the main source of fluctuations in economic activity, ironically through its well-intended but shortsighted countercyclical policies. The mainstream regarded this as a possibility and potential threat, but one that could be minimized by prompt, measured policy responses. They pointed to the relative stability of output and unemployment in the post-WW II period (see Figures 8.2 & 8.3) as tangible evidence that the activist approach had been effective in smoothing the business cycle.

But because the "rational misperceptions" view had been carefully constructed on widely-accepted microfoundations and was also consistent with initial statistical results, it was not so easily dismissed. Those unwilling to abandon long-standing activist views initially focused their criticism on the assumption of rational expectations. They argued that while people may be forward-looking to some extent, the extreme degree of calculation and economic farsightedness implied by the Rational Expectations Hypothesis was highly unrealistic. Though many conceded that the Adaptive Expectations Hypothesis was too restrictive and shortsighted, its implication of a high degree of friction in the adjustment of expectations could account for what seemed so obvious to so many—countercyclical policies have been an important factor in bringing about the relative stability of most macroeconomies in the postwar period. Without them the ups and downs of the business cycle would have been larger and longer.

But further statistical and theoretical research continued to weaken the case for adaptive expectations. As more and more studies revealed the logical and empirical superiority of the rational expectations approach, it looked as though the pendulum had swung from models consistent with Activist stabilization policies (AD/AS, at first, then AD/AS^0+AEH) to those with Non-activist implications (AD/AS^0+REH). The ensuing controversy was strong and sometimes bitter. At the same time, the analytics were highly technical, prompting an increasingly mathematical framework that sometimes seemed to lose sight of the immensely practical underlying issue—the causes and cures for the costly ups and downs in output and employment that afflict all market economies.

The result was a period of considerable disagreement and confusion. Non-activists maintained that the incorporation of expectations and the use of more powerful statistical tools had discredited the biased Activist analysis associated with Keynesian economics. Those whose instincts and policy preferences kept them from embracing these new Non-activist conclusions found themselves increasingly on the defensive. They were accused of letting their
value judgments cloud their science—clinging to the defunct adaptive expectations hypothesis only because it supported their preconceived conclusions.

It took a while for the dust to settle, but it eventually became apparent that the key issue in the Activist/Non-activist debate is not how expectations are formed. Instead it is whether changing misperceptions ($\pm \Delta(P-P^e)$) are really the only important source of output fluctuations ($\pm \Delta y$) as assumed in the AS$^e$ model. A series of statistical studies confirmed that while the rational misperceptions model can account for some of the fluctuations in output and employment that have characterized the business cycle since World War II, a large part remains unexplained. Put another way, the rational misperceptions model describes an economy in which economic fluctuations are smaller and shorter-lived than is observed in actual economies. Without denying its importance as a partial explanation of the dynamics of the macroeconomy, we must add some more ingredients before drawing any major conclusions about what government can or cannot do to reduce economic fluctuations. As you'll see in the next two sections, the fate of the controversial "policy ineffectiveness" proposition depends on whether the as-yet-unexplained fluctuations come from the supply side of the economy or whether they reflect frictions in the price and wage-setting process following demand-side shocks.

8.6 Adding Fluctuations from the Supply Side

One expansion of the rational misperceptions framework—called the real business cycle model—turns to the supply side of the economy and argues that the "missing fluctuations" in real output can be found in fluctuations in the full employment level of output itself. In terms of the expectations-augmented aggregate supply equation, $y = y^* + \beta(P-P^e)$, it hypothesizes that observed fluctuations in real output ($\pm \Delta y$) are coming not only from misperceptions ($\pm \Delta(P-P^e)$) but also from fluctuations in the natural rate of output ($\pm \Delta y^*$). Since demand-side stabilization policies are known to have little impact on the supply side, the real business cycle hypothesis retains the Non-activist flavor of the rational misperceptions model.

The real business cycle model is a radical break from the standard approach to the business cycle. At least since Keynes's *General Theory*, aggregate supply has been regarded as relatively unimportant for short run issues, exerting its undeniably important influence through...

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[15] The testing of the "rational misperceptions" model has been particularly difficult because it requires quantification of the elusive "expectations" variable in order to determine whether: (1) "misperceptions" are primarily responsible for fluctuations in output and employment and (2) expectations respond quickly to predictable events and policies (the "rational expectations" hypothesis). Any error in estimating the rate at which expectations adjust means a mis-measurement of the expectations gap and a corresponding bias in the testing of the misperceptions hypothesis.


the slower and steadier forces of long run growth (see Figure 8.1). For example, Activists and Non-activists alike have treated negative supply shocks as unusual and infrequent events, outside the regular workings of the macroeconomy. Hence the supply side of the model, so crucial to long term economic growth in both Classical and Keynesian views, has always taken a back seat in explanations of the short run ups and downs of the business cycle.

But the real business cycle hypothesis puts the supply side in the driver’s seat. Stressing random shocks to the capital stock \( \Delta k \) through uneven and unpredictable changes in technology, this approach sees economic fluctuations as largely a reflection of instability in the long run aggregate supply curve itself \( \Delta AS^* \). In keeping with the rational misperceptions model, unexpected fluctuations in aggregate demand have only a small and brief impact on real output while expected demand changes have none at all. Whatever your personal view on whether the government should follow an active stabilization policy, acceptance of the real business cycle model carries the implication that the government cannot succeed in smoothing the business cycle. It provides no support for an Activist approach to the business cycle.\(^{18}\)

How convincing is this? Does the real business cycle model—a combination of rational misperceptions with supply-side instability \( \text{AD}/\text{AS}^*+\text{REH}\Delta AS^* \), for short)—provide a convincing explanation of actual business cycles? A few very good economists think so. But these kinds of aggregate models are extremely difficult to test and evaluate. A number of quite different hypotheses are broadly consistent with the observed facts of business cycles and no one has yet found a crucial test that can reject all but one. To a considerable majority of macroeconomists, the evidence offered by real business cycle theorists has not been persuasive. Though it has served as an important reminder that supply shocks are sometimes large enough to cause substantial changes in output and employment, the real business cycle hypothesis has yet to demonstrate, in the opinion of most economists, the ability to account for the actual patterns of cyclical fluctuations observed in the U.S. economy.

\(^{18}\)But one could certainly be an Activist on issues other than economic stabilization and still accept the real business cycle theory as the best explanation of economic fluctuations.
### IN SUMMARY . . . ECONOMIC FLUCTUATIONS -- TWO NON-ACTIVIST VIEWS

1. The **expectations-augmented aggregate supply curve** ($AS^e$), in conjunction with the IS-LM model of aggregate demand (AD), provides a useful framework for analyzing macroeconomic fluctuations. It predicts that *unanticipated shifts in aggregate demand* in a fully-employed, no growth economy change both price and output at first, but over time the impact on output disappears while the price level change grows larger. (This is illustrated by the movement from $A$ to $A'$, $B'$, $C'$ and so on to $Z$ in Figure 8.6). *Anticipated changes in aggregate demand*, on the other hand, are predicted to have no output effect, with the adjustment entirely absorbed by price level changes ($A$ to $Z$, directly, in 8.6). These predictions are partially confirmed by statistical studies showing that anticipated demand shifts have smaller output and employment effects on the economy than do unanticipated shifts.

2. This adjustment process appears to reflect, at least in part, the impact of **temporary misperceptions** of the price level on decisions taken by workers and businesses. In a changing and uncertain world we cannot know the future and we will sometimes make choices, based on the best available information, that can cause employment and output to deviate from their full employment levels.

3. Since these misperceptions have costly individual consequences (such as unemployment or loss of profits), there is every reason to believe that rational decision-makers will adjust their expectations quickly as new information becomes available. This means that price misperceptions might certainly last for a matter of weeks or even months, but are unlikely to account for a drop in output that continues for a number of quarters or even years. This is the basic premise of the **rational expectations hypothesis**.

4. One implication of combining misperceptions with rational expectations is a prediction of **policy ineffectiveness**. This result argues against the use of countercyclical policy on the grounds that it is predictable and hence unable to create misperceptions that cause output to change. But a second implication is that with rapidly adjusting expectations, misperceptions cannot be large enough to explain fluctuations of the size routinely experienced by the U.S. economy. The suggestion that the Great Depression was a consequence of a decade of massive misperceptions about the price level is ludicrous at best. It points out the need to go beyond the misperceptions model in forging a complete explanation of the business cycle.

5. It is possible that the unexplained portion of the output and employment fluctuations could originate on the supply side through fluctuations in technology and the capital stock. The **real business cycle theory** argues that supply side instabilities account for whatever fluctuations the "rational misperceptions" model does not explain. Since supply side changes cannot be offset by ordinary, demand-side monetary and fiscal responses, the real business cycle view is also non-activist in its policy implications. To date, the statistical evidence to support this hypothesis is relatively weak and has failed to convince most macroeconomists and policy-makers.

### 8.7 Adding Frictions to the Adjustment Process

If supply side instability comes up short as an explanation of the missing economic fluctuations, we must find another way to supplement the promising but incomplete "rational misperceptions" theory of economic fluctuations. To fit the facts, our solution must explain why the adjustment process following a demand shock is considerably slower than predicted by the rational misperceptions model ($AD/AS^e+REH$). Put another way, we must find a substantial source of friction in the market-clearing process. The slight resistance created by the adjustment of rational expectations simply can't explain the observed sluggishness of actual
economies. While adaptive expectations can supply this missing friction, it's a solution that conflicts with both the logic and the facts of what we've learned about expectation formation.

So we turn to the possibility that these additional frictions reflect a "stickiness" in the way in which wages and prices are set in labor and output markets. Even after price misperceptions have disappeared, according to the market frictions view, the economy may not have reached full employment if some prices and wages are slow to adjust. There's an obvious Keynesian flavor here. It is essentially a milder version of the price rigidity of our original horizontal short run aggregate supply curve.

But remember that we abandoned that earlier assumption not only because it was too strong but also because it left the adjustment from short to long run unexplained. Moreover, our subsequent discussion of "microfoundations" made it seem quite improbable that workers and firms would blindly cling to wages and prices that lead to unemployment, falling profits, and a declining overall standard of living. So the "market frictions" view of economic fluctuations must face some difficult and basic questions: How could it happen that some workers can't or won't lower their wage demands even in the face of unemployment? Why is it that some firms can't or won't lower their prices even though sales are falling, inventories rising, and production levels dropping?
We begin our look at these "New Keynesian" models, as they are often called, with unemployment and the labor market. Given the obvious costs of unemployment, why don't recessionary periods lead to market clearing through nominal wage cuts? Why don't unemployed workers, seeing a real wage that is too high for full employment, initiate or at least accept a nominal wage cut that will restore full employment? We've seen that misperceptions are a partial factor but not enough to explain the observed persistence of high unemployment. The sticky nominal wage hypothesis points to additional factors that can delay the adjustment of nominal wages to changing labor market conditions. These include the presence of labor contracts, legal restrictions such as minimum wage laws, and even unwritten agreements that when business is slow, employers will reduce hours worked or lay off employees rather than engage in wage-cutting. The existence of varying degrees of monopoly power can also add frictions to both wage and price adjustments.

There are a number of plausible explanations for such sources of sticky nominal wages. One that fits comfortably under the umbrella of the "rational misperceptions" model is to suppose that workers and employers are bargaining over a three year wage contract and that both parties are trying to hit a "target real wage" at which labor demand and supply are equal and the market is cleared. Since future price levels are unknown, they will substitute current expectations of the price level ($P^e$) and then bargain for a nominal wage ($W$) that gives the target real wage that is their goal. If expectations prove correct, the nominal wage set in the contract will be consistent with labor market clearing.

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19 The pioneers of this approach include Stanley Fischer, Olivier Blanchard, Alan Blinder, Robert Gordon, Lawrence Summers, John Taylor, Gregory Mankiw, Robert Hall, Joseph Stiglitz, Laurence Ball, David Romer, George Akerlof, and Janet Yellen, among others. Major technical contributions to this research have been usefully collected into two volumes by N. Gregory Mankiw and David Romer, editors, New Keynesian Economics (Cambridge: The MIT Press, 1991).

If a labor contract freezes the real wage above its target level (e.g., at $W_1/P_0$ rather than $W_0/P_0$), firms will demand less labor and the economy will come to rest at a point below full employment (with $n_1 < n^*$) because the initial price misperception is locked into the contract. Expansionary AD policy could move the economy toward full employment by raising $P$ and lowering $W/P$.

But suppose that using their best estimates and most rational expectations, the bargainers fail to foresee a major monetary contraction that results in unexpectedly lower price levels over these three years. The result is that the real wage will be kept above its target level. Profit-maximizing firms will reduce the amount of labor hired, thereby keeping the labor market at a point like B in Figure 8.9. While this involves a "misperception"—a deviation of actual real wage from target real wage because of a price level misperception—it differs from our previous analysis because even after the error in predicting the price level becomes apparent, the existence of the contract freezes the incorrect expectation into subsequent outcomes. So the impact of the misperception persists even after expectations have been corrected.²¹

This additional source of market friction added to the rational misperceptions model restores the possibility that a timely countercyclical policy response can be effective. By shifting aggregate demand to the right, raising the price level, and thereby lowering the real wage and moving the labor market from point B to A in Figure 8.9, it could override the sluggishness built in by contracts. This, of course, puts this "rational misperceptions" plus "market frictions" combination very much in the Keynesian/Activist tradition.

²¹ You might wonder why the bargainers don't avoid price level uncertainty altogether by simply negotiating for a real wage in terms of current prices and then dealing with price changes through "escalator clauses", often termed "cost of living allowances" (COLA's), that would automatically adjust this year's money wage for last year's actual price level change. Many such contracts exist, of course, most notably in payments to Social Security recipients. But the actual implementation of escalator clauses can be quite difficult and there can be good economic reasons for either party to avoid them and to instead bargain for its best guess as to future inflation over the life of the contract.
There are other reasons why the nominal wage could remain too high for labor market clearing even in a world of rational expectations. But it should be noted that these hypotheses, like the "sticky nominal wage" approach, all imply the existence of something that may not be present in most actual business cycles. If the sticky wage view were correct, then we would expect to see falling employment and output when the real wage was rising. (Remember, it's the higher real wage that leads firms to reduce the quantity of labor hired as we move from A to B in Figure 8.9.) Similarly, when employment and output are rising (moving us from B to A), the sticky wage model predicts a decline in the real wage, encouraging firms to hire more workers. But the data seem to show that increases in output and employment are typically associated with modest increases in the real wage rather than decreases as predicted by this hypothesis. The inverse relationship between the real wage and employment predicted by this model is not found. It's possible that there are other unrelated factors that might account for the rise in the real wages when output rises, but even so it seems apparent that the "sticky nominal wage" view, by itself, cannot provide the additional explanatory power we seek.

Another and better option is to turn our attention to the price-setting process in an attempt to put together a substantive and testable sticky price hypothesis that can explain why the return to full employment is slower than can be accounted for by the rational misperceptions model. There are many factors that come to mind when we search for reasons why a firm might be hesitant to adjust its product price in the face of substantial changes in demand. An obvious one is sales contracts that obligate the firm to sell a specific number of goods at a particular price. Manufacturers of electronics or automotive components, for example, will often make such arrangements with firms that assemble final products from components supplied by many different manufacturers.

Apart from such explicit contractual agreements, firms may be reluctant to raise their prices in response to a sudden increase in demand for fear of losing the loyalty of long-standing customers. Instead they may meet the higher demand at the existing price until they are convinced that the increased demand is a lasting change and not just a transitory spurt. A related consideration is that frequent price changes are costly to a firm. Depending on the industry, a price change can mean informing a large sales force, printing new catalogs or new menus, changing coin-operated machines, or incurring other such menu costs as they have come to be called. It will generally not pay to respond to every fluctuation in market conditions by changing prices. Only with solid evidence that the change is lasting and sizable would it be sensible to finally change the price.

Yet another potentially significant source of price rigidity comes from firms that have some degree of monopoly power in their markets. For several reasons, their pricing policies

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22 It should be noted that this evidence also works against the "worker misperception" hypothesis discussed earlier, since it argues that unexpected changes in the price level alter the real wage, thereby causing firms to hire more or less labor as they move along the labor demand curve. A sudden increase in the price level, unperceived by workers but quickly detected by employers, would lead them to hire more workers. It is precisely this implication of "rising employment but falling real output" that is not observed in the data.

23 But remember that what we're after here is not just a plausible case that some prices don't adjust smoothly and quickly to changes in economic conditions. That would be easy. We can always concoct any number of stories that seem to explain the direction of observed changes. To know enough about business cycles to make wise policy choices, we need a model with enough detail about price changes to enable us to make quantitative predictions about just how quickly or slowly prices will adjust in various situations.
are likely to result in less frequent price changes than for comparable firms in more competitive industries.\footnote{See, for example, Olivier Jean Blanchard and Nobuhiro Kiyotaki, "Monopolistic Competition and the Effects of Aggregate Demand", American Economic Review 77 (September 1987) 647-666, and other articles in Section III, Imperfect Competition of N. Gregory Mankiw and David Romer, editors, New Keynesian Economics (Cambridge: The MIT Press, 1991).} The bottom line is that there are a number of factors, generally consistent with the microfoundations of rational firm and consumer behavior, that could result in a certain amount of "stickiness"—prices and wages failing to adjust rapidly to changing market conditions. These added frictions in the market-clearing process can potentially explain that part of output fluctuations missing from the rational misperceptions model.

To take this a step further, let's integrate these additional market frictions into our basic analytical framework. Remember that we were able to incorporate the effect of misperceptions into the model in a relatively simple way by adding a term—$\beta(P-P^e)$—to the aggregate supply equation. In a similar way we can add another term to aggregate supply—$\lambda(y-y^*)$—and explained below -- that mimics the effect of market frictions by slowing down the return to full employment. To see how this works, let's begin with the rational misperceptions model and take the case of an unexpected decline in aggregate demand that pushes the economy into recession as shown in Figure 8.10.

The initial short run movement from A to A' reflects misperceptions as the actual price level falls below the expected. In the model we've been using, when $P^e$ catches up to the lower $P$ the economy returns to long run, perfect information equilibrium at point Z. But if we now add wage/price stickiness, the economy will remain below full employment longer and even after all misperceptions have been dispelled (i.e., $y<y^*$ even when $(P-P^e)=0$). Put another way, we're now going a step beyond the rational misperceptions model by saying that perfect information is not enough to guarantee that the economy has fully adjusted to long run equilibrium at $y^*$. In terms of the economy in Figure 8.10, the addition of wage/price stickiness would result in a slower rate of adjustment from short to long run (A' to Z) than with rational misperceptions alone.

This more sluggish return to full employment is exactly the outcome we've been seeking. We can incorporate this added friction into the aggregate supply equation in an indirect but simple way by linking it to the gap between actual output ($y$) and its full employment level ($y^*$) from the previous time period (denoted by a -1 subscript). When an economy is pushed below full employment by a negative demand shock, the stickiness of the return to full employment can be captured by adding the previous period's negative output gap—$(y-y^*)$—to current output.\footnote{Whenever there is a continuing, persistent effect (or friction), we can get a simple measure of its current influence by including its past values. This should look familiar from our earlier discussion of the backward-looking Adaptive Expectations Hypothesis.} The aggregate supply equation can now be written as:

$$y=y^*+\beta(P-P^e)+\lambda(y-y^*)$$

where $\lambda$ is assumed to be a constant that, in combination with the output gap $(y-y^*)$, reflects the degree of market friction. So the larger is $\lambda(y-y^*)$, the greater the market friction and the slower the return to full employment.
Figure 8.10 Adding Frictions to the Adjustment Process

The addition of frictions in the setting of wages and prices slows the adjustment of the economy to fluctuations in aggregate demand. This added stickiness will retard the market-clearing process linking points A' to Z.

8.8 A General Model of Economic Fluctuations

How much do we really know about the causes and mechanics of the business cycle? Does it start on the demand or the supply side or, perhaps, both? To what extent is the recovery prolonged by price misperceptions and to what extent by frictions in the adjustment of prices and wages? Are there other important factors to consider? Do we have enough solid evidence to build a strong case for—or against—the use of monetary and fiscal policies to reduce cyclical fluctuations in real output and employment?

The answer, of course, is implicit in the fact that a number of quite different views coexist among economists. The combination of ambiguous statistical results, inability to conduct carefully controlled experiments, and differing personal views on the economic role of government can lead one economist to an Activist conclusion on stabilization policy while another takes the Non-activist path. It would simplify policy-making greatly if we could assert, beyond a reasonable doubt, that countercyclical policy is always effective or always ineffective in smoothing the business cycle. Unfortunately we cannot. Research on this topic continues at a rapid pace and it is possible that the next decade will see the development of dynamic macroeconometric models that substantially increase our detailed knowledge of the market-clearing process. For now, however, we must make do with the incomplete and mixed evidence at hand.
This may well make you wonder whether all the work on the microfoundations of expectations, real business cycles, and market frictions over the past 25 years has made much practical difference. In fact, it has. Even though we don’t have a single, simple model of fluctuations that is accepted by all, the range of disagreement has been narrowed substantially. This will be discussed carefully in the next chapter when we combine the inflation issue with stabilization of output and employment.

Before leaving the discussion of macroeconomic fluctuations, let’s try to fit these various pieces into a larger picture. Major advances in the modeling of expectations and market frictions in the 1970s and 80s have stirred much controversy. But instead of thinking in terms of competing "schools of thought" -- Classical, Keynesian, New Classical, Monetarist, New Keynesian, Activist, Non-Activist, Rational Expectations, Real Business Cycle and so on—suppose we acknowledge the possibility that the observed fluctuations in real output (±\(\Delta y\)) can sometimes come from the supply side (±\(\Delta y^*\)) and sometimes from the demand side (±\(\Delta AD\)); that departures from full employment can reflect rational misperceptions (\(\beta(P-P^e)\neq 0\)) or market frictions (\(\lambda(y-y^*)^{-1}\neq 0\)) or both; and that the relative importance of these different ingredients is likely to differ under different circumstances.

From this more general perspective, the economy can be in full, long run equilibrium (on its AS* curve) only when misperceptions and market frictions have disappeared. In terms of the expanded aggregate supply equation

\[
y = y^* + \beta(P-P^e) + \lambda(y-y^*)^{-1},
\]

this requires that the last two terms on the right hand side of the equation must be equal to zero (i.e., \(P-P^e=0\) and \((y-y^*)^{-1}=0\)). Unexpected changes in aggregate demand will cause initial short run departures from full employment via misperceptions (\(P\neq P^e\)), the severity of which depends on the size of the resulting misperceptions and the magnitude of the coefficient \(\beta\). How quickly output returns to full employment following this demand shock then depends on how rapidly expectations adjust to end the misperceptions and also on the degree of market friction or stickiness as reflected in the size of the lagged output gap \((y-y^*)^{-1}\) and its coefficient \(\lambda\). If the two crucial coefficients \(\beta\) and \(\lambda\) differ across time or nations, then looking for a simple answer and a correct "school of thought" is inappropriate.

Combining the competing hypotheses into a more general model obviously doesn't get us to a simple answer. But it can keep us aware that there may be a different mix of factors for different cyclical episodes. This means that the appropriate policy response to one downturn might not fit another. For example, if we suspect that the main source of a particular fluctuation in real output comes from the supply side (as with supply shocks induced by "oil crises" or natural disasters), ordinary demand-side stabilization policy will be of little help. When the shock is more clearly from the demand side, then we need to make some judgment on the magnitude of the size of \(\beta\) and \(\lambda\) and the relative importance of "misperceptions" and "market frictions".

Currently the dominant view among macroeconomists is that while misperceptions disappear fairly quickly (through rational expectations), market frictions are significant enough to result in a substantial slow down in the return to full employment. Therefore, when fluctuations originate on the demand-side, a prompt monetary or fiscal counter-response has the potential to speed up the return to full employment. But it should be noted that the presence of demand-
side fluctuations in a world with significant market frictions doesn't automatically mean that an Activist response is appropriate. To the extent that there are additional frictions in the policy-making process itself, for example, our response carries the risk of coming too late to be of much help. In some cases it may actually destabilize the economy by taking effect after market-clearing is complete. This is the "policy lag" issue stressed by Milton Friedman and other Monetarists for so many years.\footnote{Another very important outcome of the debate over macroeconomic policy analysis has been the discovery of some underlying flaws in the policy-making process. The issue of an inflationary bias stemming from Activist policies is a concern regardless of one's theory of economic fluctuations. It leads to a discussion of whether policy "rules" could usefully replace policy "makers" in certain areas of macroeconomic policy. This is covered in Chapter Nine.}

Policy-makers can't avoid making a judgment, perhaps informally, about which of these several factors are most important in a given cyclical fluctuation and which can be safely disregarded. Thinking in terms of this more general model instead of slogans from one of the schools of thought can keep us from being too dogmatic on an issue in which we are all very fallible. In recent years the extremes of the early positions—one said "markets clear quickly", the other said "it's obvious they don't"—have been reduced dramatically as our theoretical and empirical knowledge has advanced. Few applied economists would now argue that a well-executed and timely counter-cyclical policy could never succeed in reducing fluctuations in output and employment. But it surely does not follow that everyone embraces an Activist position on stabilization policy. Many economists continue to be persuaded by the Classical tradition, arguing on philosophical grounds that even if the government "can", it "shouldn't". Others, many favoring a broader and more active economic role for government in some areas, oppose Activist countercyclical policies as both (1) too uncertain in their benefits because of the possibility of unforeseen time lags in the policy making process, and (2) too risky in the political arena due to the possibility that the political process itself will hinder the implementation of a "well-executed and timely" counter-cyclical policy.

On the surface, it appears that while all the evidence isn't in, the verdict is going in favor of a Keynesian market friction view. But if we look more closely, we also see that those who adopt the Activist position on economic stabilization today, unlike the "old" Keynesians of earlier decades, set quite narrow limits for the scope of these policies. The most important new ingredient is the limitation that rational expectations puts on the extent to which policy can deal with issues involving misperceptions. In addition, concerns with potential destabilization from policy lags and with the possibility of political compromises that handicap such policies have resulted in a modern Activist position that is quite cautious in its recommendations and much more modest in its expectations for smoothing the business cycle.

It is a considerable irony that in some important ways the modern Keynesian position is closer to the modern Classical view than to the original policy Activism associated with Keynesian economics.\footnote{See N. Gregory Mankiw, "The Reincarnation of Keynesian Economics" European Economic Review, 36 (1992) 559-565 for a non-technical discussion of the difference between old and new Keynesian economics. Mankiw argues that the contrast is sufficient to suggest the possibility "that the term "Keynesian" may have outlived its usefulness."} This tempering of views on stabilization policy seems to be a very healthy development in macroeconomics. Not only does it reflect progress in using careful theoretical and statistical analysis to narrow the range of disagreement but also allows us to
more easily disentangle our views on what the government can do from what we think it should do.

**IN SUMMARY . . . A GUIDE TO BUSINESS CYCLE THEORIES**

Underneath the broad umbrella of the AD/AS model, we find some related but distinct theories of economic fluctuations. They all begin from the AD/AS framework but differ on some other basic assumptions, including their answers to the following questions:

1. What is the primary **source of disturbances** to the macroeconomy?
2. How **fast** do expectations adjust to changing circumstances?
3. Are **other frictions** in the market clearing process important?
4. Are **policy lags** highly variable and unpredictable?

Because they have quite different policy implications, these variations define what are often thought of as different "schools of thought" on the issue of stabilization policy. Even though there's no reason to declare allegiance to one and reject all others, it is useful to know the major characteristics of these views because of their widespread use among politicians and the media.

**Keynesian Model (AD/AS±ΔAD+AEH)**

1. The main source of disturbances is thought to be from fluctuations in aggregate demand (±ΔAD), primarily from the private sector (such as autonomous consumption (±Δc0), investment (±i0), and money demand (±Δj0)).
2. Expectations adjust relatively slowly to changing circumstances in a manner that is best captured by the Adaptive Expectations Hypothesis.
3. Policy lags can usually be anticipated and taken into account in advance in our policy responses.
4. No other frictions are explicitly added, though it is presumed that additional sources of non-market clearing are present but their effects are captured in the lag in expectations assumed by the AEH.

**Monetarist Model (AD/AS±ΔM+AEH+Lags)**

1. The main source of disturbances is from the demand side, specifically from erratic stop-and-go policies of the monetary authority (±ΔM).
2. Expectations adjust relatively slowly, as described by the AEH.
3. Policy lags are thought to be "long and variable" and, most importantly, unpredictable. As a result, policies intended to be **counter**cyclical can end up being pro-cyclical.
4. No other frictions are thought to be important.
New Classical Model \((AD/AS^\pm \Delta M^t + REH)\)

1. Fluctuations in the macroeconomy are primarily from unexpected changes in the money supply \((\pm \Delta M^t)\).

2. Expectations adjust very quickly, as described by the Rational Expectations Hypothesis \((REH)\).

3. Policy lags are not thought to be of much importance.

4. No other frictions are important.

Real Business Cycle Model \((AD/AS^\pm \Delta y^* + REH)\)

1. Fluctuations from the demand side are relatively unimportant in their impact on output and unemployment. The main source of business cycles comes from the "real" side of the economy -- the supply side \((\pm \Delta y^*)\). Random fluctuations in capital, primarily from uneven technological change, cause business cycles.

2. Expectations adjust rapidly and are best described by the REH.

3. Policy lags are not significant.

4. No other frictions are important.

New Keynesian Model \((AD/AS^\pm \Delta AD + REH + "Z")\)

1. The main source of disturbances is thought to be from fluctuations in aggregate demand \((\pm \Delta AD)\), primarily from the private sector (such as autonomous consumption \((\pm \Delta c_0)\), investment \((\pm i_0)\), and money demand \((\pm \Delta j_0)\).

2. Expectations adjust rapidly and are best described by the REH.

3. Policy lags are not a major problem.

4. The market-clearing process is characterized by a number of frictions that result in an observed "stickiness" in wages and prices. Collectively symbolized as "Z", they slow down the economy's return to full employment even though expectations may have adjusted rapidly.
8.9 Overview

1. This chapter starts by questioning the simple AD/AS assumption of a price level that is absolutely rigid in the short run but completely flexible in the long run. Useful as that model is in many contexts, it tells us little about the nature of economic fluctuations and the prospects for smoothing them through countercyclical stabilization policies. Understanding these issues requires that we develop a theory of the adjustment process that links short run with long run outcomes.

2. An important ingredient in any explanation of fluctuations in real output and employment (often termed the "business cycle") is the influence of uncertainty, expectations, and misperceptions on economic decision-making. A relatively simple way to incorporate these elements is through the expectations-augmented aggregate supply equation (AS*): $y = y^* + \beta(P - P^e)$. The graph of this equation in the long run is the familiar vertical $AS^*$ curve and where "long run" is defined as a situation of perfect information, $P = P^e$, so that the last term of the equation disappears, leaving just $y = y^*$. The "short run" is now defined as an interval during which price expectations ($P^e$) are fixed. Geometrically the short run shows up as a family of upward-sloping supply curves rather than the horizontal short run curves of the earlier model.

3. Combining this new theory of supply with the standard IS-LM model of aggregate demand yields a more realistic AD/AS* framework. According to this approach, unexpected shifts in aggregate demand initially cause the economy to move away from full employment by creating price level misperceptions ($P \neq P^e$). This happens because of the way in which these misperceptions distort the labor supply choices of workers and the production decisions of businesses. As expectations adjust to the new circumstances, these distortions disappear and the economy returns to its full employment level of output and employment.

4. The duration of these short run fluctuations depends entirely on the speed at which price expectations adjust to the actual level of prices. So in order to evaluate how well the AD/AS* model can explain real world business cycles, we must add a theory of price expectations—that is, an explanation of how rapidly they adjust to new information. The Adaptive Expectations Hypothesis (AEH) portrays a process in which we learn from our past forecasting errors and essentially extrapolate current price level expectations from observed price levels of the past. The main appeal of the AEH is that it is a very easy way to infer the value of something that is not directly measurable. But the adaptive expectations hypothesis implies that decision-makers ignore all other information in formulating their price expectations, focusing only on the actual price levels of the past. This backward-looking implication makes it much too narrow to be a plausible explanation of much actual behavior. Despite its operational convenience, the adaptive expectations hypothesis has gradually been abandoned by most macroeconomists.

5. It has been replaced by the Rational Expectations Hypothesis (REH), which supposes that decision-makers use a wide array of information in forming their price (and other) expectations. The development of this more sophisticated model of expectations ignited a major controversy among macroeconomists in the 1960s and 70s. The reason was that when the rational expectations hypothesis (REH) is combined with the misperceptions theory (AD/AS*), the resulting rational misperceptions model yields an implication of policy ineffectiveness that directly challenges the mainstream view that active fiscal and monetary policies are needed to moderate the inherent instability and fluctuations of a market economy.
6. The subsequent flood of research on expectations increasingly supported the rapid expectations adjustment implied by the REH over the sluggish adjustment of the AEH. This appeared to imply that misperceptions would disappear so quickly that there was no time for countercyclical policies to be implemented. Long-standing advocates of an Activist role for government seemed to be put in the position of clinging to the primitive and erroneous adaptive expectations hypothesis in order to justify their belief that the use of policy manipulation was necessary to moderate the instability of the macroeconomy.

7. It eventually became clear that the "rational misperceptions" model (AD/AS²+REH) of the business cycle yields a useful but incomplete picture of actual economic fluctuations. Its implication of a quick return to full employment, which seemed to reinforce the Non-activist view, does not account for observed slower response of real world economies. But rather than return to the more sluggish "adaptive misperceptions" model (AD/AS²+AEH), most economists have chosen to stick with the rational expectations hypothesis and look elsewhere for the "missing" fluctuations.

8. The most radical attempt to supplement the rational misperceptions approach is the Real Business Cycle theory. Departing from nearly all previous models, Activist and Non-activist alike, the real business cycle approach argues that the origin of the missing fluctuations is on the supply side rather than the demand side of the economy. Instability in the full employment level of real output itself (i.e., ±Δy* and ±ΔAS*) is said to be a major source of the business cycle. Since there is little evidence that monetary and fiscal changes can offset supply-side instabilities, the real business cycle model (AD/AS²+REH±ΔAS*) supports the Non-activist implications of the "policy ineffectiveness" view. While the "real business cycle theory" is a serious contender, it has not been accepted by the vast majority of macroeconomists as a convincing explanation of macroeconomic fluctuations.

9. If the missing components of the business cycle aren't to be found on the supply side, we must return to our basic framework and search for other explanations as to why economic fluctuations aren't as shallow as predicted by the rational misperceptions framework. We must find additional frictions, beyond the adjustment of price expectations, that can explain why deviations of real output from its full employment level last as long as they do. Two simple explanations—rigid short run prices and sluggish (adaptive) expectations—can provide the additional friction but in ways that are theoretically and empirically unconvincing. The alternative has been the development of a theory of price and wage stickiness, carefully grounded in the microfoundations of rational choice. This New Keynesian approach goes inside the price and wage-setting process in search of underlying sources of friction in the market-clearing process. It considers the influence of contracts, menu costs of price change, and monopoly power in attempting to paint a richer and more convincing picture of market adjustments. In supplementing the rational misperceptions model with market frictions (AD/AS²+REH+"Z"), it retains the possibility that Activist stabilization policies can smooth macroeconomic fluctuations.

10. But this New Keynesian framework is much more highly evolved than its primitive Keynesian/Activist ancestors. In grounding its conclusions in microfoundations rather than assertions of rigidities, it resembles New Classical and Real Business Cycle models more than it does the early Keynesians. By focusing on frictions within the market-clearing process, it portrays an economy in which timely countercyclical actions can hasten the return to full employment and thereby smooth the business cycle. But the success of Activist policy is far
from guaranteed. This will depend on the specifics of the case for a particular economy at a particular time. We will need to know not only the degree of stickiness that is keeping the economy from full employment, but also the extent of any lags that may afflict the policy-response process.

11. Research in this area of market frictions is still in its infancy. At least for the foreseeable future, policy-makers will need to continue to use the combination of science, value judgment, hunch, slogan, and whatever else has guided them in the past. While the argument over whether the government can smooth the business cycle still goes on, the distance separating Activists and Non-Activists has diminished notably. In particular, strong views in favor of aggressive Activist "fine tuning" have little support today. Activists who view the world through a New Keynesian lens are quite different than the Activists of earlier decades. They are likely not only to put more faith in the automatic forces of market-clearing but also be less optimistic about the ability of a large centralized political decision-maker to respond in a consistent and timely fashion.

8.10 Review Questions

1. Define the following basic concepts or terms:

   Macroeconomic fluctuations
   Stabilization Policy
   Expectations-augmented aggregate supply
   Worker misperception hypothesis
   Firm misperception hypothesis
   Adaptive expectations hypothesis
   Rational expectations hypothesis
   "Rational Misperceptions"
   Policy Ineffectiveness Proposition
   Market frictions
   Sticky nominal wage hypothesis
   Sticky price hypothesis
   Menu costs
   Policy lags
   Keynesian model
   Monetarist model
   New Classical model
   New Keynesian model

2. It is widely believed that private saving in the U.S. has diminished over recent decades and that this is responsible for a number of our economic problems. But suppose there is a sudden and substantial increase in saving as it returns to earlier levels, with a resulting decline in autonomous consumption (-Δc₀). In terms of our new expectations-augmented model (AD/ASᵉ) trace the impact of this event from short run through long run, explaining the process linking short and long run outcomes. Specifically, use the model to explain how this drop in autonomous consumption will affect y, P, r, i, x, b, and e.

3. According to the AD/ASᵉ framework, price level expectations can play a significant role in determining real output, real interest rates, and so on.

   a. Use this model to show the likely impact of a sudden doubling of the expected price level, assuming no other changes in events or policies. In particular, explain whether there is good reason to fear that such an economy would be highly susceptible to the problem of "self-fulfilling prophecies".
b. How does the extent to which changing price expectations affect real output depend on whether expectations adjust "adaptively" or "rationally"? Explain.

4. According to the AD/AS model, why do price level misperceptions have such a potentially powerful impact on the overall economy? Explain fully.

5. Evaluate the statements below, noting how they depend on the presence of certain specific conditions.
   a. "The "policy ineffectiveness proposition" is Non-activist propaganda masquerading as scientific analysis. It has no logical foundation and it obviously doesn't apply to the world in which we live."
   b. "Fine tuning is likely to do more harm than good because it treats the symptoms of instability rather than their underlying cause."

6. The call for an end to continuing government budget deficits is not only politically bipartisan but has advocates from all the schools of thought on macroeconomic fluctuations. Suppose a substantial cut in government spending is made to try to end the large cash flow deficits. How would the predictions of its macroeconomic consequences differ across the following groups: Keynesian, New Keynesian, New Classical, Real Business Cycle, and Monetarist? Explain.

7. Recent studies have shown that for every $100 loss of income/output in the economy ($\Delta y$) the government absorbs approximately $33 of it. About $25 of the $100 drop in before-tax income comes out of taxes. Another $8 comes from increased transfer payments (e.g., unemployment compensation and welfare payments) and increased interest payments (on the rising Federal deficit). The net result is that household income falls only about $67 instead of the full $100. Many believe that this "automatic stabilizer" mechanism has been responsible for much of the apparent reduction in output and employment fluctuations in the U.S. in the post WWII period.
   a. Explain how the declining tax payments and increasing transfer payments work as an "automatic stabilizer".
   b. In what ways is that preferable to using discretionary policy changes to deal with the problem? In what ways is it inferior? Explain.
   c. Suppose we extend the scope of this program by increasing transfer payments so that the entire loss in income is cushioned. Evaluate the likely costs and benefits of such an aggressive automatic stabilization program. Explain.

8. To which explanation of cyclical fluctuations—Classical (C), Keynesian (K), Monetarist (M), New Classical/Real Business Cycle (NC/RBC), or New Keynesian (NK)—do you think each of the following 10 statements applies? (Note: they may fit more than one or they may fit none.) Briefly defend your answer.
   (1) "Economic fluctuations associated with the ups and downs of the business cycle are not a major economic problem. In fact, they're the inevitable side-effects of the workings of a market system."
(2) "The primary justification for having policy rules is the presence of long and variable lags in the policy-making process."

(3) "The major reason that unemployment persists so long is the failure of price expectations to adjust rapidly enough."

(4) "The credibility of the government (our confidence that they will carry through on their announced policies) determines, in part, the size of the business cycle."
(5) "As sincere as policy-makers' intentions may be, the unfortunate result is that their attempts to smooth the business cycle actually make it worse."

(6) "As sincere as policy-makers' intentions may be, their attempts to smooth the business cycle are futile. They have no impact whatsoever on output and employment and they only end up diverting our attention away from those areas in which government policy can make a difference."

(7) "Changes in government spending cause equal and opposite changes in private spending, leaving total demand unchanged."

9. The New Keynesian view of macroeconomic fluctuations is obviously a descendent of earlier views in the Keynesian, Activist tradition. Compare these two views in terms of both their basic assumptions and their implications. Evaluate the statement that "the New Keynesian view is closer to the New Classical approach than to the old Keynesian model."

10. "It is the responsibility of the government to take such steps as are necessary to minimize the recessionary phase of the business cycle. The cost in terms of lost output and jobs is simply one that cannot and need not be tolerated." It seems almost impossible to disagree with such a noble statement, the kind that any successful politician can unleash at a moment's notice. Yet a careful economic analysis would reveal a number of substantive issues that would put this into the "easier said than done" category. Evaluate this statement from the perspective of the following views of economic fluctuations: Monetarist, New Classical, Real Business Cycle, Keynesian, and New Keynesian. Explain your reasoning carefully.

8.11 Further Reading


