

10. THE SUPPLY-SIDE MODEL AND THE NEW ECONOMY

By the early 1980s, the macroeconomic landscape had changed significantly for the United States and several other Western European economies. Once-successful Keynesian discretionary demand-side stabilization policies appeared to be ineffective. The output-inflation tradeoff seemed to be no longer in evidence—expansionary fiscal and monetary stimuli only yielded additional inflation with no accompanying increase in GDP growth or employment. The Phillips curve, for all intents and purposes, appeared to be dead.

According to the rational expectationists, the emerging school of macroeconomics at that time, these changes were clearly indicative of the demise of the Keynesian model. They claimed that, once again, the paradigm had shifted and that the model that best described the economy, had changed from Keynesian to Rational Expectations.

Leading this revolution were economists such as Robert E. Lucas, Thomas Sargent, Robert Barro, JoAnna Grey, and E.S. Phelps, who ushered in the rational expectations paradigm with its attendant supply-side policy implications. These economists fundamentally believed in an optimizing, market-clearing approach to macroeconomics. A greater role of expectations, uncertainty, and asymmetric information, accompanied by more sophisticated time-series analyses, were the hallmarks of this school of thought.

This chapter begins with an examination of the causes underlying the so-called demise of Keynesian macroeconomics. We explore the transition from the Keynesian to the rational expectations paradigm by deriving the expectations-augmented aggregate supply curve (AE-AS). This will be followed by an analysis of the supply-side policy implications of the rational expectations model.¹ A case will then be made to link these supply-side policies to the advent of the New Economy in the United States, the reformist attempts made by Germany and France from 2007-8, the policies adopted by the European Central Bank (ECB), and espoused by China in 2016.

The latter half of the chapter includes a discussion of the Keynesian response to the alleged paradigm shift propounded by the rational expectationists. This is followed by a Keynesian analysis and explanation of the “so-called” New Economy and the outlook pertaining to its longevity. Interestingly, the Keynesian explanation of the second paradigm shift, as well as the transition to the productivity-drive New Economy, may be as compelling as that provided by the supply-siders.

We then discuss the identification problem, which helps explain how and why both the Keynesian as well as supply-sider models can legitimately co-exist in the United States and other developed economies. Finally, this chapter explores whether the two paradigms can be reconciled—even in the short-run. Robert E. Lucas’ well-known ‘islands’ model will be overviewed

here in the context of the ability of policy makers to exploit perceived output-inflation tradeoffs in an economy characterized by imperfect information.

10.1 THE EXPECTATIONS-AUGMENTED AS CURVE: AN EXPLANATION OF THE PARADIGM SHIFT

In Figure 1, we derive the JoAnna Grey/Phelps expectations-augmented aggregate supply curve. This is a positively sloped AS curve that bears a resemblance to the positively sloped Keynesian AS curve of the previous chapters and has similar policy implications. Fiscal and monetary policies will indeed affect GDP and inflation, but the similarity ends there. The expectations-augmented AS, as the name implies, incorporates a significantly higher degree of sophistication pertaining to expectations formation over time. It is this feature that explains how this AS may have transitioned into the rational expectations AS curve by the early 1980s to usher in the shift from the Keynesian era to the supply-side model.

The four diagrams in **Figure 1** should be familiar from earlier AS derivations. The two plots on the left are the production function and the labor market, while the two on the right are the y-y reflector and (P,Y) space in which the expectations-augmented AS is to be derived.

The crucial assumption that “drives” this derivation is that information is asymmetric.² Here, demanders of labor (employers) are assumed to know the changes in contemporaneous prices as well as nominal wages. That is, they “see” changes in both P and W in the current time period. Suppliers of labor (workers), on the other hand, do not see/know changes in both P and W in the current period; they are only aware of the change in their nominal wages (W). In this sense, information in the labor market is asymmetric—workers know only one piece of information (changes in nominal wages, W), while employers know both pieces of information (changes in W and P) in the current time period.

Employers know both (all) pieces of information, not because they are necessarily any smarter than the “workers”, but rather because employers have access to more information by interacting with wholesalers and sub-contractors, and have more knowledge about imported goods, inventories, transportation costs, etc.

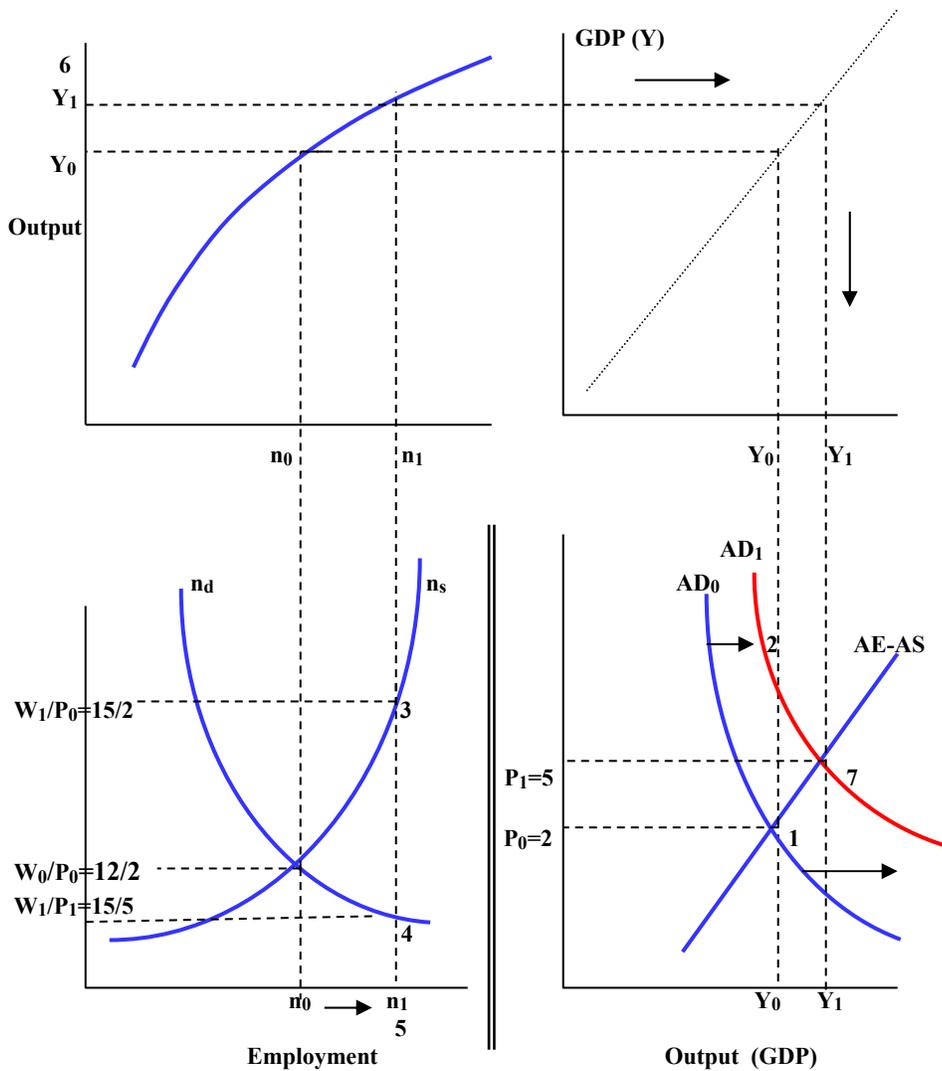
We now turn to the derivation of the AS curve that will explain the paradigm shift and lead the way to the controversial New Economy. The New Economy has always generated a storm of controversy from the Keynesians who insist that the “old” paradigm is alive and well, and the whole business—the “so-called” paradigm shift in the 1980s to the “New Economy”—fits well into their original framework without necessitating a paradigm shift.

10.1.1 DIAGRAMMATIC DERIVATION: EXPECTATIONS-AUGMENTED AGGREGATE SUPPLY CURVE

Steps 1-7 are represented by corresponding numbers in Figure 1.

- Initially, the economy is at Y_0 and prices are at P_0 . We plot this point in (P, Y) space. For pedagogic simplicity, let $P_0 = 2$, and nominal wages, $W_0 = 12$. Equilibrium exists in the labor market at n_0 . Let the initial Y_0 be some recessionary rate of growth that warrants stabilization.

Figure 1



2. We are given that, following some demand-side stabilization, AD_0 shifts right to AD_1 , causing P_0 to increase to P_1 , from 2 to 5, and nominal wages to increase from W_0 to W_1 , from 12 to 15.
3. Given the assumption that information is asymmetric, employers know that prices have more than doubled but nominal wages have only gone from 12 to 15. However, workers “see” only the change in nominal wage from 12 to 15, and consequently think that they are “better off” as their salaries (W) have now increased. They are inadvertently “fooled” into believing that they are better off, and they supply more labor.³
4. This information asymmetry leads to an increase in demand for labor as well. Employers discern correctly that they are now paying only 3 in real wages ($15/5$), as opposed to 6 earlier ($12/2$), and they demand more labor (point 4, in Figure 1). In this stylized version of the Grey/Phelps model, point 3 in Figure 1 is where workers “think they are” in terms of real wage and labor supply, while point 4 is where producers “know” they are.
5. This increase in labor supply driven by asymmetric information on the part of suppliers of labor (workers), coupled with the increase in demand on the part of demanders of labor (producers), leads to employment increasing to n_1 in the labor market, in figure 1.
6. As employment increase to n_1 , GDP growth increases to Y_1 as seen in the production function.
7. Reflecting this higher Y_1 into (P,Y) space and plotting, we obtain the second point, (P_1, Y_1) . Joining this point to the initial given point (P_0, Y_0) , we obtain the expectations-augmented AS curve.⁴

The expectations-augmented AS curve is indeed positively sloped like its Keynesian counterpart of an earlier chapter. The Keynesian AS was positively sloped by virtue of nominal wages being “sticky” and not changing in proportion to prices. The expectations-augmented AS, on the other hand, is positively sloped due to imperfect—asymmetric—information which leads workers to mistakenly interpret observed nominal wage increases for real wage increases and, hence, to supply more labor.⁵

The expectationists argue that this asymmetric information approach best explains the positively sloped AS curve which generated the successful output-inflation tradeoffs from the 1950s to the late 1970s in the US. After all, since nominal wage freezes were primarily in effect only during the Depression (1929-33), and given that an exploitable Phillips curve was indeed in effect during from the 1950s to the 1970s, the imperfect information theory would be the only viable explanation for the positively sloped AS.

In addition to explaining the output-inflation tradeoff, the heightened sophistication of the intertemporal expectations-formation structure also provides for a cogent explanation of Paradigm Shift II from the Keynesian to the supply-sider paradigm in the United States in early 1980s, and then, perhaps, again by 2016.⁶

10.1.2 PARADIGM SHIFT II: AN EXPECTATIONS-AUGMENTED EXPLANATION

How long can a tradeoff driven by imperfect information be exploited? Do workers misinterpret observed nominal wage changes for real wage changes only in the short and medium-term? Wouldn't suppliers of labor (workers) eventually realize that their real wages had actually deteriorated (from 6 to 3) over repeated episodes of demand-side stabilization policy?

Turning to **Figure 2**, we pick up where we left off in Figure 1. The positively-sloped, expectations-augmented AS curve facilitates output-inflation tradeoffs. But, over time, the relentless pursuit of expansionary fiscal and monetary policies with successive recessions result in workers eventually realizing that their observed increases in nominal wages (12 to 15) have not been in proportion to the actual increases in the price level (2 to 5).

In other words, workers now “catch on”; they update their information sets and revise their expectations. When another round of fiscal and monetary stabilization is anticipated, workers/unions now indulge in proactive long-term contracts to ensure that the real wage is not eroded by the next series of stabilization policies.

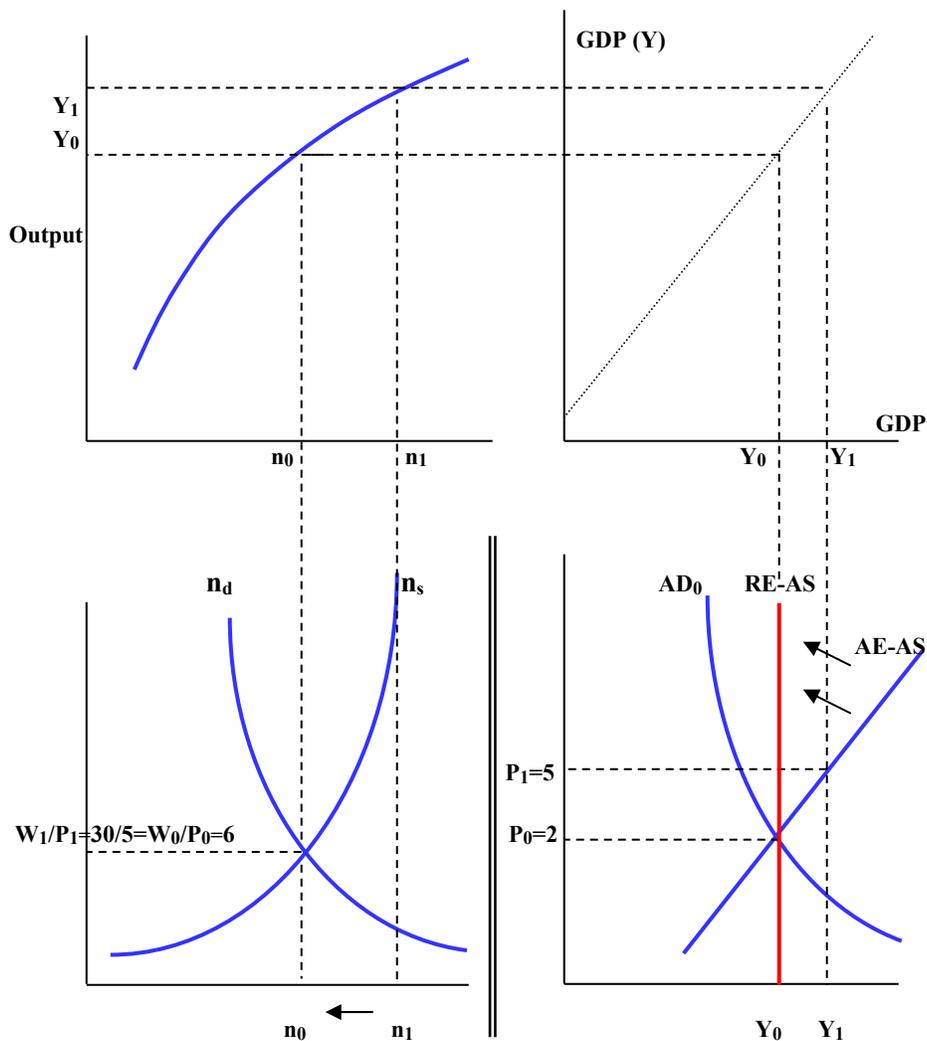
Thus, in our example here, workers/unions now contract for a nominal wage of $W_1=30$. This nominal wage W_1 ensures that real wages remains unchanged from $W_0/P_0 = 12/2 = 6$ initially, to $W_1/P_1 = 30/5 = 6$, once again.

At this point, information has become symmetric. Both suppliers as well as demanders of labor now accurately identify changes in all pieces of information, W and P . In Figure 2, this full (symmetric) knowledge on the part of both demanders and suppliers of labor translates to equilibrium employment n_0 once again corresponding to a real wage of 6. And, from the production function, GDP growth corresponding to employment n_0 is back to Y_0 .

If we reflect this final Y_0 over to (P, Y) space and plot (P_1, Y_0) to join with the original point (P_0, Y_0) , we obtain the rational expectations AS curve (RE-AS), which is the theoretical centerpiece of the new supply-side paradigm (figure 2). Since the RE-AS is a vertical line similar to the Classical model which predates the Keynesian paradigm, the RE-AS is also known as the new classical aggregate supply curve.

Economies that transition from the positively sloped expectations-augmented AS to the vertical RE-AS are typically those with (i) sophisticated labor forces with market power capable of influencing long-term nominal wage contracts, and (ii) fully-articulated and efficient bond markets that accurately “signal” expected inflation to workers as well as employers. Typically, developed economies are more likely to have these two criteria in place compared to emerging economies. The latter may be burdened with larger pools of excess labor incapable of affecting nominal wage contracts (as in parts of China, India, Eastern Europe, South America, Africa), and often lack well-developed government bond-markets.

Figure 2

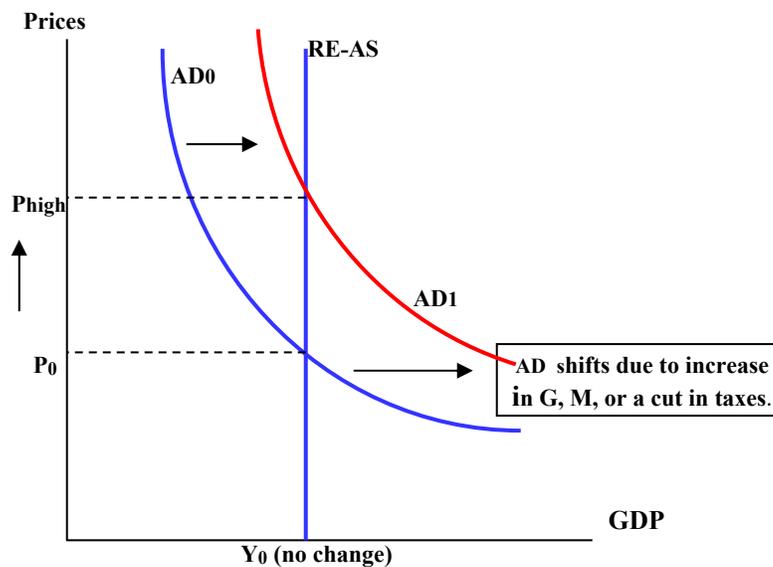


Employment

Output (GDP)

Remember that Keynesian discretionary fiscal and monetary policies have no effect on real GDP growth or employment in a classical-type model. In fact, demand-side stabilization, the mainstay of Keynesian policy, is neutral to real variables and affects only nominal variables such as inflation and nominal wages. This is now the case, as depicted in **Figure 3** where expansionary demand-side stabilization is attempted. Changes in G or M change only the rate of inflation—GDP growth remains at Y_0 . The output-inflation tradeoff has vanished. The Phillips curve relationship, vital for jump-starting or soft-landing economies, is conspicuously absent. The paradigm has now “shifted” from K-AS to RE-AS.⁷

Figure 3



Against this new backdrop, if Y_0 is indeed some recessionary “low” rate of growth, how can GDP and employment be stimulated if expansionary fiscal and monetary policies have no effect? Since shifting the aggregate demand affects only inflation, leaving Y_0 unchanged, clearly the only viable policy option would be **to shift the aggregate supply** to the right to increase GDP growth. This radical emphasis on policies designed to shift the

aggregate supply curve instead of the aggregate demand led to the aptly named “supply-side” model.

According to this theory, as once successful aggregate demand-side policies began to fail in developed economies possessing more sophisticated labor markets that are characterized by forward-looking information in efficient bond markets, policy makers began to focus their attention to shifting the aggregate supply.

10.2 SUPPLY-SIDE ECONOMICS

Three main elements of effective supply-side policy are:

- (1) Significant income/personal tax cuts
- (2) Sweeping corporate/business tax cuts
- (3) Massive deregulation.

10.2.1 SIGNIFICANT INCOME TAX CUTS

The crucial assumption here is that in addition to stimulating after-tax consumption as discussed earlier, income tax cuts also impact the labor market. Tax changes now also result in shifts in labor supply and demand curves.

The Labor supply is now defined as:

Labor Supply = f(real wage, personal tax rates, macroeconomic outlook).
(+) (-) (+)

Here labor supply is positively related to the real wage and macroeconomic outlook, and negatively related to personal tax rates.

An intuitive explanation of a tax-cut-induced increase in labor supply is as follows. There is a sense on the part of suppliers of labor that these tax cuts are temporary, and hence currently employed workers may avail themselves of such tax cuts by working more hours. In addition, individuals not currently in the work force (not actively seeking employment, as discussed earlier), may now find it worthwhile to seek employment, thereby becoming a part of the civilian labor force, and increasing the participation rate. The pool of available workers increases as more and more disenfranchised individuals now “come back” into the active labor market, thereby shifting the labor supply to the right. These new entrants to the labor force now find it worth their while to re-enter the work force, given that, with the tax-cuts, the government is not siphoning away a disproportionate share of any additional income in the form of high taxes.

Conversely, personal tax increases result in shifts in labor supply to the left as individuals realize that, at the margin, it is not worthwhile to enter the

labor force. For example, former homemakers turned workers might now choose to remain at home if higher income tax rates lead to very insignificant (if any) real income gains after incorporating expenses such as child-care, housekeeping, and transportation.

An alternative explanation linking labor market shifts to tax changes is as follows. As presented in **Figure 4a**, initially at employment n_0 the real wage was $(W/P)_0$ and the initial labor supply curve is n_{s0} . Let the government impose a tax of t . Income tax increases, in effect, decrease the after-tax real wage. In this situation, what increase in real wages would the workers have to be offered so that, once again, they supply n_0 labor? The answer is the after-tax real wage would have to be the same as it was before the tax increase. Thus, to induce employment of n_0 again, the real wages would have to rise by t to offset the tax increase. This translates to an upward shift in labor supply by t . This exercise holds true for any and all levels of employment, thus resulting in the labor supply curve shifting up (“left”) from n_{s0} to n_{st} .

The opposite holds for tax cuts; the labor supply shifts down (to the “right”), as presented in **Figure 4b**. Here, to maintain the original level of employment n_0 following the tax cut, the real wage would have to decrease by t to ensure that the after-tax real wage matches that before the tax cuts. Once again, this mechanism holds for all levels of employment thus shifting the labor supply down, or to the right.

While tax changes also affect disposable income and consumption as in the Keynesian model, one key difference between the two paradigms is that in the case of the rational expectations paradigm, taxes also influence the labor market.

Figure 4a

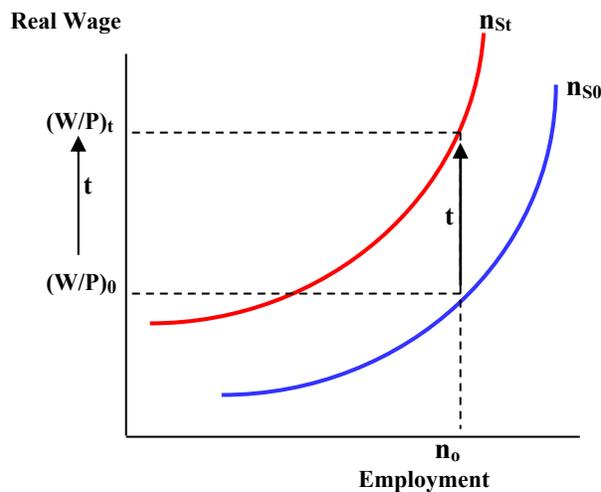
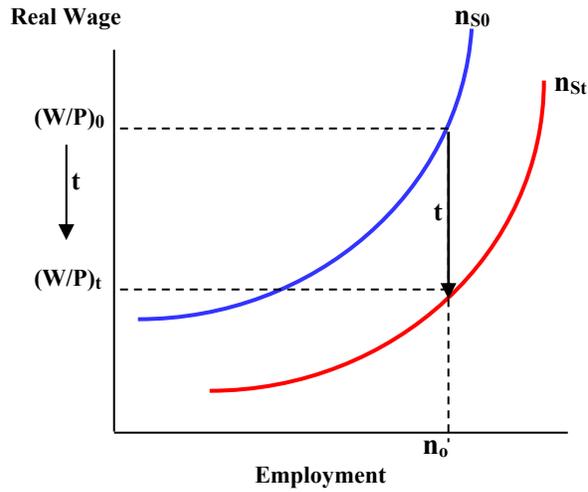


Figure 4b



The next main element of supply-side policy pertains to business tax cuts.

10.2.2 SWEEPING CORPORATE/BUSINESS TAX CUTS

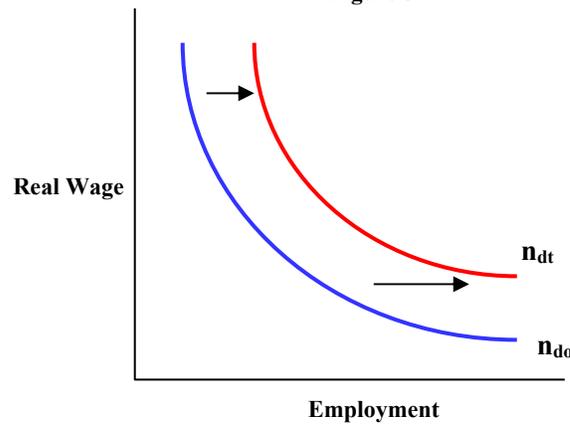
Here, labor demand, depicted in **Figure 5**, is given by:

$$\mathbf{Labor\ Demand} = f(\text{real wage}, \text{business tax rates}, \text{macroeconomic outlook}).$$

$(-)$ $(-)$ $(+)$

Labor demand is negatively correlated to real wages and business tax rates, and positively correlated to the macroeconomic outlook.

Figure 5



The assumption here is that with business tax cuts such as investment tax credits, and with accelerated depreciation, firms (demanders of labor) increase labor demand. Once again, the sense that the tax cuts are “temporary”, coupled with an opportunity to increase shareholder wealth, leads employers to demand more labor.

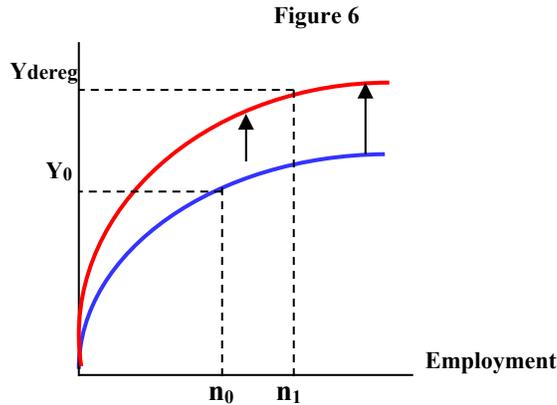
Hence, cuts in corporate/business taxes shift labor demand to the right, from n_{d0} to n_{dt} as presented in Figure 5, while increases in these taxes do the opposite.

Changes in the third term, “macroeconomic outlook”, also shift the labor demand and supply curves. As the outlook improves, both labor demand and supply curves shift right, and vice versa. This term, unlike tax rates, is not an exogenous policy instrument, but is, instead, determined by endogenously formed expectations. Discussions pertaining to stagflation and recessions, later in this chapter, will activate this term that lies dormant at this stage.

10.2.3 DEREGULATION

According to the supply-siders, government intervention is perceived to be intrusive and excessive and is believed to retard the productivity of the private sector, with “productivity” defined as output per worker per unit time. An economy unfettered by such excessive government regulation, therefore, is likely to experience an increase in productivity.

Figure 6 represents an economy with a sharp decrease in unproductive government regulation. With massive deregulation, at each and every unit of



the labor force a higher output is now possible— n_0 labor now results in the higher Y_{dereg} as opposed to the initial output level Y_0 when the economy was highly regulated due to the increase in productivity.

For example, upon deregulation, industries such as airlines and trucking would now determine optimal routes, prices, and stops based on market

forces, and not on required schedules and limits imposed by government. Similarly, financial institutions and utilities would determine their rates and fee-structures based on market-driven competition, and not on some government-imposed mandate. All these sectors would experience increases in productivity.

The United States embarked on an active deregulatory policy beginning in the later years of the Carter administration, followed aggressively by President Reagan and his successors to the present. Examples of deregulated industries in the US are airlines, trucking, financial services, telecommunications, and utilities. Western Europe, the United Kingdom, France and Germany have all seen deregulation adopted with varying degrees of intensity from the early 1990s to the present.

According to the supply-siders, an excessively regulated economy retards productivity in that private enterprise will not be “unleashed” to maximize the creative and risk taking instincts present in inherently dynamic economies. In this case, the reverse of Figure 6 occurs; the production function “bends down” with lower output produced at each and every level of employment.

Emerging economies have also embraced the concept of “less government,” to some extent. However, these cases usually involve a two-stage process beginning first with privatization, eventually followed by gradual deregulation. Once again, with varying degrees of success, Mexico, Argentina, India, China, and Chile (to name a few) have, in fits and starts, attempted privatizations of industries once considered safely within the government domain. (Please refer to the discussion of State Owned Enterprises, SOEs, from Chapter 6).

10.2.4 SUPPLY-SIDE STABILIZATION

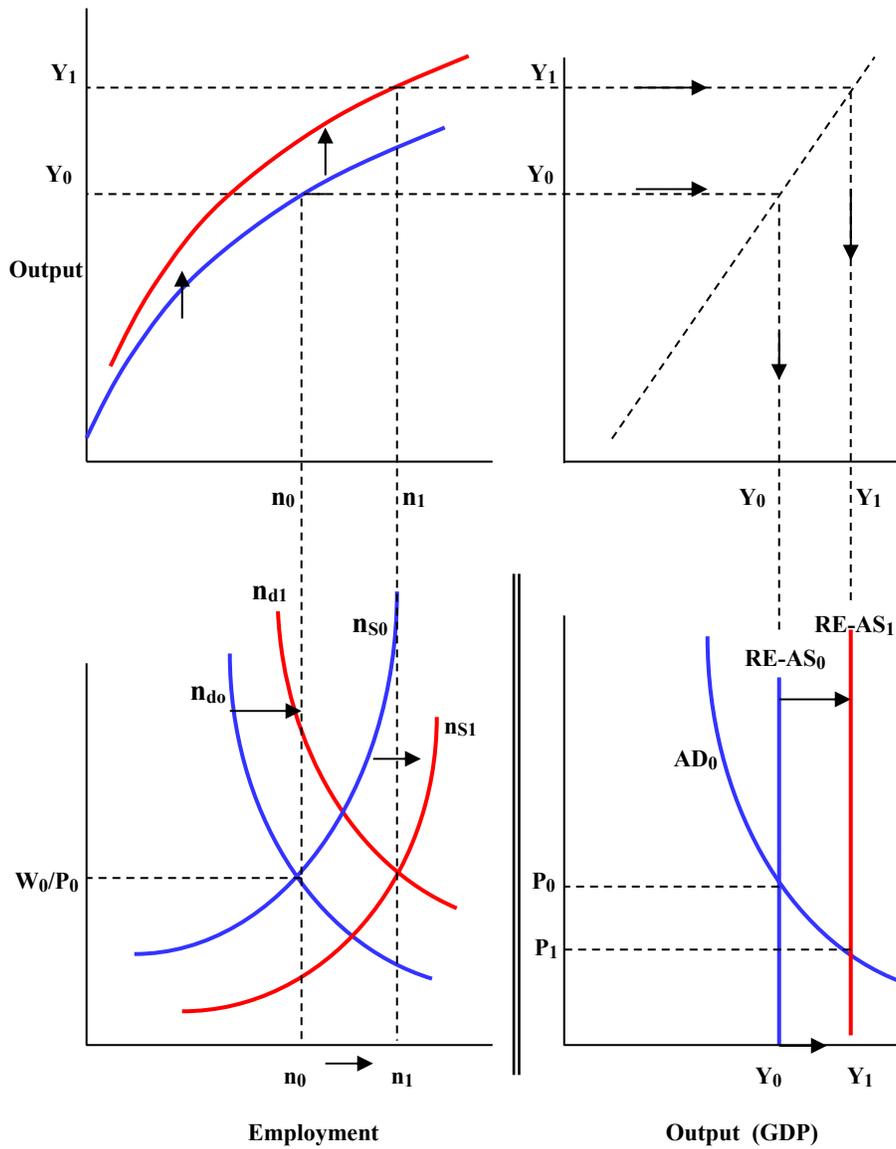
Integrating the three major supply-side policies, **Figure 7** displays the essence of shifting the AS curve to the right. Initially Y_0 is some low recessionary rate of growth corresponding to employment at n_0 . The AS is a rational expectations AS curve in an economy characterized by symmetric information.

A combination of personal and business tax cuts set against a backdrop of government deregulation of key industries results in a final shift to the right in the RE-AS. Here, both labor supply and demand curves shift right due to the tax cuts, and the production function rises due to the surge in deregulation-driven productivity. This supply-side stimulus results in GDP growth increasing from Y_0 to Y_1 and employment from n_0 to n_1 as depicted in Figure 7.

In this case, the increase in output growth is not matched by an increase in inflation, as was the case in the Keynesian paradigm. Here the rate of

inflation actually falls from P_0 to P_1 . There is no output inflation tradeoff in this paradigm—the Phillips curve relationship is gone. Instead, increases in output and employment growth are accompanied by convenient decreases in the rate of inflation!

Figure 7



Ireland and Information Technology: A Supply-Side Story

Beginning in the late 1990s, Ireland embarked on a serious supply-side policy that may well have contributed to its re-engineered status as the Information Technology (IT) powerhouse of Europe into the early 2000s.

Corporate tax rates as low as 10%, coupled with a well-educated labor force, a five-year “tax holiday” for new foreign investment in IT, and a conspicuous absence of “meddlesome” government regulation, resulted in a huge global capital inflow primarily in the IT sector. More than 45 percent of American investment in Europe’s electronic industry in the late 1990s was absorbed annually by Ireland. Consequently, by the late 1990s, Ireland was making one-third of all personal computers sold on the Continent, and GDP growth at times exceeded an annual rate of 10 percent.

The supply-side policies adopted by Ireland were not popular with continental Europe, where large government spending coupled with higher taxes dominated macroeconomic policy.

By 1998, the European Commission had labeled Ireland’s policy of giving a preferential tax rate of only 10% to its financial services and manufacturing sectors as “unfair” to European Union (EU) members with higher tax rates (almost 32%). The Commission claimed that attracting global investment with low tax rates was tantamount to a hidden State subsidy to its champion sectors and, therefore, technically illegal.

Ireland responded to this pressure in the late 1990s by agreeing to eliminate the 10% rate for its few “championed” sectors. It then announced, however, that all its sectors would be taxed at a new uniform rate of 12.5%, one-third the average corporate tax rate in Europe! Ireland was determined to keep the continental penchant for taxation at bay, and to retain its hard-won title of “Celtic Tiger”.

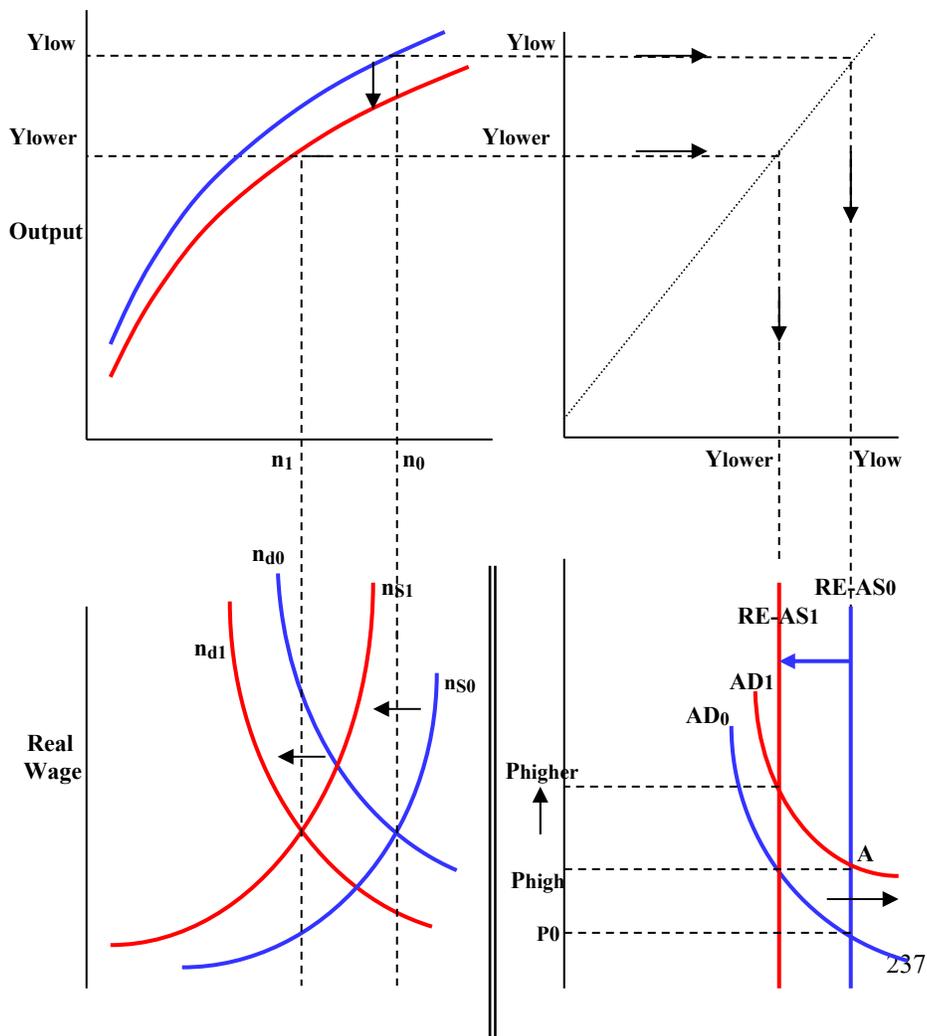
Update: With the progress, came the challenges. Massive capital inflows accompanied Ireland’s resurgence, and with capital flows came inflows of high-skilled labor too. The runaway capital inflows and confidence pushed Ireland into vicious SAP bubbles in housing and equities, and Ireland did not fare well in the sub-prime crisis of 2008-14. But by 2016, the fundamental supply-side, low-tax, low-regulation bedrock of the Irish economy was resulting in Ireland being one of the earliest Eurozone economies to recover.

10.3 STAGFLATION

An economy in the throes of stagflation is characterized by a rising rate of inflation and an ominously falling rate of GDP growth and employment as described in **Figure 8**. Typically, “stagflation” brings to mind the severe episodes experienced by the US, Japan, and Western Europe in the 1970s which coincided with the oil crises.

Oil shocks slammed into the world economy following the October 1973 Yom Kippur War, when the Arab oil-producing nations sharply restricted oil exports. Another shock followed shortly thereafter in 1979, this time related to the Iranian revolution and the deposition of the Shah. Inflation rates soared to double digits coupled with similar rates of unemployment and shrinking national GDP rates.

Figure 8





Further aggravating the situation may have been the paradigm shift from the Keynesian to supply-sider (rational expectations) model, in progress in many developed economies from the mid to late 1970s. According to the expectationists, policies designed to jump-start economies stuck at Y_{low} and mistakenly still considered Keynesian only served to worsen the rate of inflation. Rightward shifts in the AD due to frequent and desperate attempts at fiscal and monetary stabilization only increased P_0 to P_{high} , labeled A in figure 8, without any accompanying relief in GDP or employment.

Superimposing the effects of the oil shocks and the accompanying reduction in productivity as production was forced to move to non-optimal, secondary sources of energy, resulted in a downward shift in the production function.⁸ Additional leftward shifts in labor demand and supply caused by the deteriorating outlook, completed the dismal picture. The final toll of stagflation was an even higher rate of inflation at P_{higher} and a worsening recession at Y_{lower} as presented in figure 8.⁹ Higher inflation coupled with stagnating or deteriorating output finally resulted in the paradigm-busting Stagflation.

By late 2008, the specter of Stagflation was again starting to emerge—not just in the US after the sub-prime crisis (described in Article 11.3), but in many Asian economies and certainly in Western Europe, as policy makers shuddered at the prospect of slowing growth and rising prices.

10.4 FROM THE SUPPLY-SIDE TO THE NEW ECONOMY

From a macroeconomic perspective, the 1990s could be characterized as the era of the New Economy in the US. Following the minor recession of 1990-91, and before 2001, the US economy displayed an amazing nine years of very strong GDP growth, productivity gains, and record low unemployment, set against a backdrop of virtually no inflationary pressure. The Europeans were quick to adopt such a performance as a policy goal, and in Singapore, Japan, and China policy makers became determined to put their own respective versions of the New Economy into operation.

According to the expectationists, the New Economy traces its roots to the supply-side policies put in place in the early 1980s. The massive deregulations, it is argued, paved the way for the eventual breakthroughs in technology. Firms and individuals were free to respond to market pressures, and to seek out market opportunities. The climate fostered risk-taking,

massive private capital investment, and entrepreneurship. The unleashed creativity of US enterprise (according to this argument), in turn led to the inevitable internet-assisted economy, resulting in permanent structural increases in productivity (see the following box).

Technological growth, fostered in part by the early deregulations, shifted the production function up. Over time, labor demand and supply curves also shift right due to a stronger “macroeconomic outlook” fueled by expectations of yet more growth, thereby increasing equilibrium employment.

These combined labor-market and productivity effects resulted in a rightward shift in the RE-AS, resulting in the hallmark of the New Economy—growth in GDP without an accompanying increase in inflation. In fact, during the heyday of the New Economy in the US in the mid 1990s to 2000, quarterly GDP growth at times exceeded 5% with unemployment in the 3% range and with hardly any appreciable change in the rate of inflation.

The diagram depicting the New Economy is identical to figure 7, which presents the supply-sider paradigm. The only difference is that the production function in the New Economy is shifting up not to deregulation *per se*, but rather to a result of the deregulation—gains in productivity stemming from breakthroughs in technology. Additionally, in the labor market of the New Economy, the labor demand and supply curves do shift to the right but not due to large personal and business tax cuts. Instead, the curves shift right because of endogenous expectations of strong growth.

Labor demand also increases due to increased productivity, since this increased productivity implies an increase in the marginal product of labor. While this feature is not explicitly incorporated in our labor market for expositional convenience, we assume that the “outlook” term captures this shift in addition to expectations of future real growth. Indeed, the “outlook” term is positively correlated to productivity gains, and productivity has a strong procyclical component as discussed below.

The New Economy and the Productivity Puzzle

The New Economy lives and dies by its ability to influence overall productivity. Faster GDP growth with lower inflation, higher profits, and budget surpluses is vitally dependent on high and increasing productivity. While the US may be at the early stages of a more sustainable New Economy (Phase 2, if you will), the numbers from Phase 1 have been truly quite impressive. Labor productivity, defined as output per worker per hour, jumped from 1.4 percent during 1975-93, to over 3 percent during 1995-2000 in the US, by even the most conservative estimates. In the non-farm business sector, for example, growth of output per hour accelerated to a 2.8 percent

annual rate during 1996-2000 as the New Economy blossomed, compared to just 1.6 percent for the previous 25 years.

The crucial question then is how much of this increase in productivity is structural (long-term/permanent), and how much is cyclical. After all, during boom times, employers do tend to work their employees harder to keep pace with additional demand, thereby contributing to increased productivity statistics. Conversely, as the economy slows, employers who are reluctant to shed employees at the first sign of a slowdown, keep them on the payroll but have them producing less output commensurate with the falling demand. This results in falling productivity numbers as the economy slows. This feature may account for a procyclical—moving “with” the business cycle—component of measured productivity.

Robert Gordon, long an outspoken skeptic of the New Economy, finds (from an ongoing series of empirical studies) that the productivity gains touted as “permanent” New Economy features exist only in the manufacture of computers (hardware) and a few other durable goods. The remaining productivity increases, he concludes, are cyclical. At the other end of the spectrum, however, New Economy proponents at the Federal Reserve find evidence that across-the-board labor productivity increases since the early 1990s have indeed been structural, implying a conservative rate of growth at just over 3%.

Superimposed on this vitally important debate is the enormous expenditure in the 1990s in the US on information technology (IT). Large capital spending on IT can influence labor productivity in two ways, by either (i) “capital deepening” which essentially increases the amount of capital available per worker, or (ii) affecting “total factor productivity” (TFP) which increases the efficiency with which units of labor and capital generate increases in output.

Very simply, total factor productivity is a residual defined as:

TFP = Percentage increase in real output per unit time – (percentage increase in labor + percentage increase in capital, per unit time)

Interestingly, by the early 2000s, several studies had found evidence to indicate that almost half of the acceleration in productivity growth between the first and second halves of the 1990s in the US was, in fact, due to capital deepening and not due to an increase in TFP. If capital deepening were indeed the case, a cut-back in IT spending would have serious ramifications for the New Economy by virtue of the rapid ensuing decrease in the supposedly large “capital deepened” component of productivity. Proponents of this theory point to the US experience in the early 2000s as evidence.

Accurate measures and determinants of productivity are absolutely vital in estimating the longevity and intensity of the New Economy. After all, with

fiscal and monetary policy deemed ineffective, and given the advanced stage of deregulation in the US, macroeconomic growth (in this model) would now be dependent solely on productivity gains.

This crucial subject will be revisited when we summarize the outlook and nature of “Phase 2” of the New Economy towards the end of this chapter.

So how does the Keynesian paradigm reconcile itself to the observed “New Economy” behavior, namely the increases in productivity and growth without any accompanying increases in inflation during the late 1990s-early 2000s? How would the Keynesians explain the apparent demise of the Phillips curve and the “failure” of demand-side stabilization, as claimed by the supply-siders during this period?

To answer these questions and to discuss the Keynesian response, a brief overview of the identification problem in analyzing time-series data is in order.

10.5 THE IDENTIFICATION PROBLEM

Figures 9a and 9b present two pairs of observed real world data points, (P_0, Y_0) and (P_1, Y_1) , represented by **A** and **B**. The rates of inflation, P_0 and P_1 , and the rates of GDP growth, Y_0 and Y_1 , are two sets of observed inflation and output growth rates, respectively. (P_0, Y_0) and (P_1, Y_1) can be interpreted as rates of inflation and GDP growth at two points in time, with (P_0, Y_0) being in Period Zero and (P_1, Y_1) in some later time (Period One).

Figure 9a

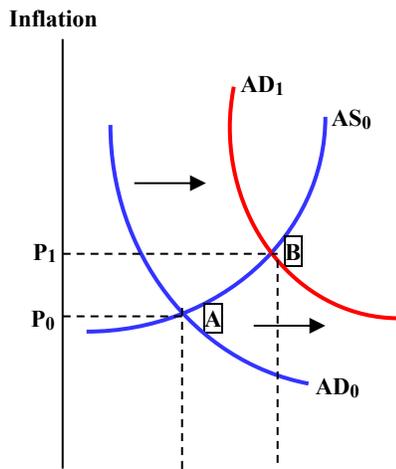
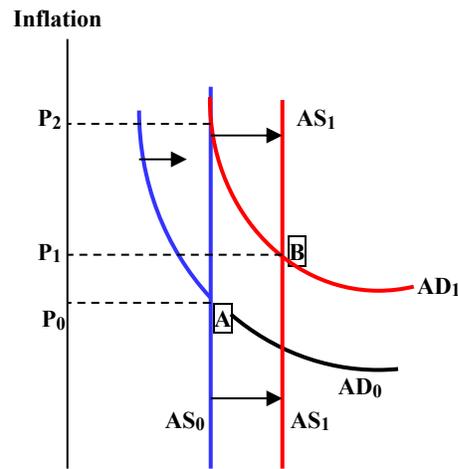


Figure 9b



Y₀ Y₁ Output

Y₀ Y₁ Output

While the points A and B in 9a and 9b are directly observable, the actual models explaining how the economy progressed from (P_0, Y_0) to (P_1, Y_1) are not. In other words, while we “see” points A and B, we do not actually “see” the respective underlying AS and AD curves. It is up to macroeconomic theory to construct mathematically consistent models that can explain the movement of the economy from points A to point B, and in doing so, to form a “template” within which all future policies can be analyzed.

From Figures 9a and 9b we can see that two drastically different models can explain the observed path of the economy from A to B equally well. In Figure 9a, a Keynesian paradigm with expansionary demand-side policy (increasing G, M, or cuts in taxes) has jump-started this economy, taking it from point A at (P_0, Y_0) to point B at (P_1, Y_1) . In this case, the output-inflation tradeoff has been realized.

However, in Figure 9b the same points A and B can now be linked within the context of a supply-side paradigm. Here the initial AS curve, AS_0 , is shifted to the right, presumably by tax cuts, deregulation, a surge in productivity, and/or expectations of strong future growth. The AD is also shifted to the right by the same demand-side policies as in Figure 9a (increases in G or M or cuts in taxes). This combination of AD and AS shifts results in an economy transitioning from A to a new equilibrium at B in Figure 9b.¹⁰

Both paradigms, irrespective of their underlying philosophies and policy prescriptions, provide us with perfectly reasonable explanations of an economy moving from A to B. Herein lies a fundamental reason for the ongoing debate and confusion pertaining to “the” right model in developed economies—both paradigms legitimately co-exist because both fit the observed data equally well.¹¹ This is one very intuitive explanation of the **identification problem**, prevalent in the analysis of serially correlated time-series data, making it extremely difficult to identify the single “correct” model within which macroeconomic policy must be analyzed, prescribed, and conducted.

While the two paradigms diagrammatically “explain” the shifts from points A to B equally well, the policy implications remain radically different. In 9a, for example, stimulative demand-side policy—increases in G or M or cuts in taxes—is solely responsible for the increase in national output from Y_0 to Y_1 . Here, the shift in the AD “drives” real economic growth.

In 9b, on the contrary, the demand-side shift by itself, without an accompanying supply-side shift in the AS, would only result in an increase in inflation from P_0 to P_2 , with output growth stuck at Y_0 . It is only when the AS curve is shifted to the right due to some combination of deregulation, business

tax cuts, and increases in productivity that output increases from Y_0 to Y_1 . In sharp contrast to 9a, the boost to real economic growth in 9b is solely due to the AS shift.

10.6 A KEYNESIAN EXPLANATION OF THE “NEW” ECONOMY

Figure 10a presents the Keynesian response to what has been labeled the “new” economy. The Keynesians claim that there is nothing “new” about the economy, but that, once again, the confusion (according to this school of thought) may have been sown by the identification problem.

Keynesians do not deny the inescapable fact that productivity has increased in the US starting in the 1990s. While the exact nature and composition of this increase in productivity—structural versus cyclical, and “capital deepening” versus TFP—are vigorously debated in the academic and policy literature, the increase in productivity, powered by the internet economy, cannot be denied.

However, the Keynesians point out that all aggregate supply curves, be they vertical or kinked, will shift to the right as the production function bulges up with an increase in labor productivity. In Figure 10a, Keynesians demonstrate that even a Keynesian AS, shifted to the right by productivity gains, will replicate the exact same observed “New Economy” results of increasing Y and falling P .

Figure 10b reproduces the conventional expectationist view of the New Economy discussed earlier, with IT gains driving productivity increases and shifting a vertical AS to the right. Once again, thanks to the identification problem, both paradigms seem to fit the New Economy mantra of “growth without increasing inflation” equally well. Once again, the two sets of observed data, **A** and **B** in 10a and 10b, are identical, and the debate continues to rage.

Figure 10a

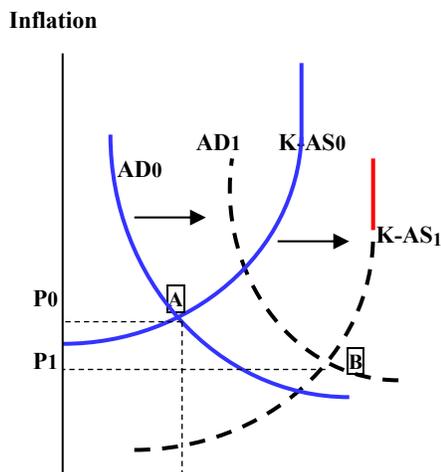
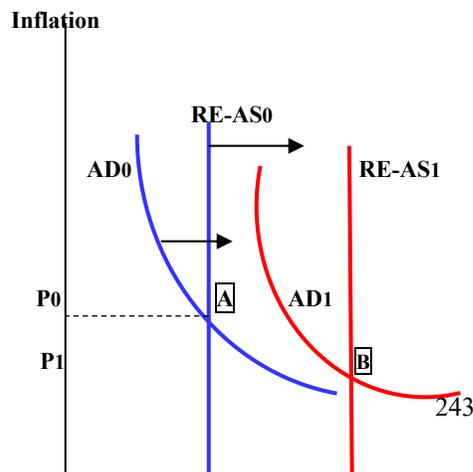
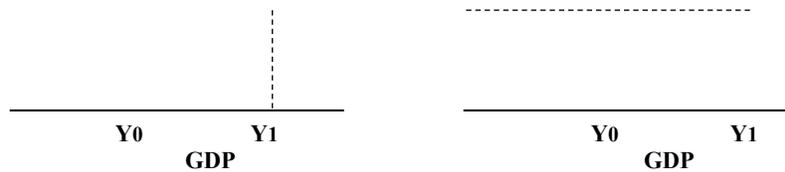


Figure 10b





The major difference between the two explanations, however, is that the Keynesians believe that the “new” economy spawned in the 1990s was an episodic, one-off shift in the kinked K-AS curve. They argue that once this somewhat dramatic shift to the right of the K-AS slows down, and increases in technology and productivity eventually stabilize to some lower “more sustainable” level, the K-AS curve’s rightward shift will be arrested.

They claim that, once again, demand-side stabilization, with its attendant Phillips curve and its symptoms of overheating and soft-landing will reassert itself with a vengeance. Once again, discretionary fiscal and monetary policies will stabilize output and employment. It is only in this transitional phase, they argue, that atypical results such as growth without accompanying increases in inflation are to be observed

The expectationists contend that while the identification problem technically leaves the door open for ongoing debate regarding the legitimacy of the New Economy, the episodes of stagflation were evidence enough that information had in fact become symmetric in developed economies. Fiscal and monetary stabilization would not have real long-term effects given the vertical nature of the rational expectations AS curve.

They insist that, in the long-run, any and all increases in real output and employment growth can only come about through shifts to the right in a vertical AS, driven by ongoing breakthroughs in technology-powered productivity gains. Shifting the AD, without any accompanying shift to the right in the vertical AS, would, according to their paradigm, only result in increases in inflation with no change in output or employment.

While the New Economy proponents attribute most of the increases in productivity to policies put in place in the formative days of supply-side economics in the early 1980s, Keynesians emphasize that the coincidental influence of a host of other contributing factors cannot be denied. For example, the strength of the US dollar from the early 1990s served to keep prices of imports down and to some extent may have mitigated incipient inflationary pressure. The Asian crises of 1997-8 followed by the rapid relative strengthening of the US dollar did much to lower prices of imports, and the drop in semiconductor prices through the 1990s was certainly a contributing factor. Furthermore, they point out that the worldwide glut in global commodities—not to mention fuel—also kept inflation in check. Keynesians stress that these factors, and not just supply-side initiatives, went

a long way to contribute to the “growth without inflation” that has come to characterize the New Economy of the late 1990s and the early 2000s.

In the Keynesian view, GDP growth in the “new” economy was largely a result of a conventional text-book Keynesian stimulus—expansionary monetary policy. The significant monetary expansion in the US in the mid to late 1990s was the primary source of GDP growth, plain and simple. The AD was shifted to the right in a fairly standard Keynesian expansion, over a Keynesian AS due to an increase in M, thanks to a generally looser Fed monetary policy for much of the 1990s. This, coupled with a one-time shift to the right in the Keynesian AS (presented in 10a) due to the permanent increase in productivity stemming from the internet-powered economy, resulted in the so-called “growth without inflation” that was, in the Keynesian view, erroneously attributed to some permanent paradigm-shattering New Economy.

The new economists and their supply-side ancestors have argued that the Phillips curve was “dead”. The Keynesian response is that the Phillips curve was simply lying dormant in the heyday of the New Economy. It was temporarily masked by the one-time rightward shift in the Keynesian AS due to the growth in productivity.

In fact, during the early 2000s, the not-so-soft landing by the Federal Reserve, followed by repeated attempts to jump-start growth by increasing monetary growth and decreasing interest rates, led many analysts to wonder if the Keynesian paradigm was indeed back on center-stage. These moves, followed by the fiscal and monetary stimulus package in the US since 2002, smacked clearly of vintage Keynesianism. And then, the massive post-2008 stimulus plans and the Quantitative Easing unleashed by the Fed (discussed earlier in this book), were textbook Keynesian stimuli.

10.7 CONTRASTING THE “NEW” ECONOMY WITH THE “OLD” ONE

The “old”, or “traditional”, economy is loosely interpreted to be the Keynesian model, while the New Economy is seen as the most recent iteration of the technology-driven version of the supply-side, rational expectations, vertical AS model. The differences between the two models go way beyond the obvious theoretical and diagrammatic ones. As discussed, the two paradigms clearly have very strong policy implications that are fundamentally polar extremes of each other.

The following **Table 1** will help recap and overview all the differences in the two paradigms.

Table 1

“New” Economy (Vertical AS) Supply-Side	“Old” Economy (Keynesian AS)
<p>1. Changes in fiscal and monetary policies (increasing G or M, for example), result in no real effects. Only the rate of inflation is affected with no change in Y or employment. There is no role for activist fiscal or monetary policy in this economy, much like the earlier classical paradigm.</p>	<p>Expansionary fiscal and monetary policies generate multiplier effects. Rates of Y and employment increase, as do C and I. Conversely, contractionary policies can engineer soft landings. There is a distinct discretionary role for activist fiscal and monetary policy.</p>
<p>2. There is no output-inflation tradeoff. In fact, increases in output are matched by decreases in the rate of inflation.</p>	<p>There is a very evident output-inflation tradeoff. The Phillips curve relationship is evident. Increases in inflation are accompanied by increases in GDP growth and decreases in the unemployment rate.</p>
<p>3. Increases in GDP growth and employment are driven by technology-enhanced productivity growth that result in a supply-side stimulus. Furthermore, this productivity growth can be traced back to deregulation and the ensuing climate of risk-taking and entrepreneurship that it fosters.</p>	<p>Growth in GDP and employment are driven by demand-side policies that stimulate the aggregate demand (AD). Deregulation will also shift the K-AS to the right and may certainly increase productivity in some areas, but the rightward shift in the AS would be episodic—a one-time shift.</p>
<p>4. Large infusions of global capital are vital to fund the disparity between total demand for loanable funds and the total supply of loanable funds. Massive capital inflows finance high-technology startups fostered by the explosion in creativity and entrepreneurship. Please refer to discussion on the NSI (national savings identity) in Chapter 3.</p>	<p>Typically, as shown in the NSI discussion, large infusions of global capital are essential to fund bond-financed budget deficits. These deficits are caused by large increases in government spending necessary to generate Keynesian multiplier effects.</p>

<p>5. Changes in nominal wages and prices are (with short lags) fully flexible. Information is symmetric. Long-term government bonds operating in highly efficient bond markets signal future inflation effectively. Labor markets are relatively more deregulated, and workers have more market power. This allows them to negotiate long-term wage contracts and to maintain their real wages.</p>	<p>Nominal wages do not change fully in proportion to changes in prices. Some combination of excess supplies of labor (in emerging economies), imperfect information, or nominal wage rigidities, yield the positively sloped AS curve. Labor markets are relatively more regulated, and workers do not have the ability to negotiate real wage contracts—they have relatively less market power.</p>
<p>6. Inflation pressures are now harder to detect as increases in inflation are not positively correlated to GDP growth. Conventionally measured Supply-Side AS (contd.)</p> <p>inflation may appear benign, but dangerous speculative asset price (SAP) bubbles in the stock market, the IT sector, and real estate may develop.</p>	<p>Overheating is easier to detect. Inflationary pressures are evident in conventionally measured indexes. Since inflation here is procyclical, an Keynesian AS (contd.)</p> <p>overheated economy “growing too fast” will exhibit dangerously rising inflation across the board. Long-bonds in this economy are good indicators of expected inflation.</p>
<p>7. In summary, this economy is driven by continuous increases in productivity in a highly deregulated economy, represented by ongoing rightward shifts in the vertical AS. There is no role for fiscal and monetary policy in influencing GDP growth or employment.</p> <p>There is no rapid-action “emergency package” to rescue a traumatized economy. For instance, there could be no supply-sider response on September 12, 2001, in the wake of 9/11 and the ensuing drop in confidence.</p>	<p>In summary, these economies are primarily stabilized by active demand-side fiscal and monetary policies. Many Keynesian regimes would advocate privatization and eventual deregulation of large inefficient SOEs. Regarding productivity increases, constant (flat) productivity growth is usually viewed as the norm, with occasional, episodic, rightward shifts in the K-AS.</p> <p>This paradigm allows for an emergency stimulus package of rapid increases in M and planned increases in G when the economy is in crisis, as exemplified by the US \$100 billion stimulus package immediately following 9/11.</p>

10.8 CAN THE TWO MODELS BE RECONCILED?

Purists from both camps would recoil at the suggestion. In the long-run, given the fundamental structural differences driving the two paradigms, any chance of a “compromise” model reconciling the two polar views would be extremely unlikely in developed economies. (Emerging economies are typically Keynesian, as discussed earlier.)

By the early 2000s, however, an increasing number of analysts along with mainstream policy-oriented economists, have proposed a model of a developed economy transitioning from a Keynesian-type AS curve in the short-run to a supply-side model in the long-run.¹² This quasi-paradigm, which could also be labeled the “synthesis view”, is composed of “long-term” New Economy adherents who believe that, although the AS is eventually vertical, there is indeed room for short-term, demand-side stabilization. For example, in the very short term, the central bank may need to quickly “hit the brakes” to stem runaway growth or to re-ignite growth and confidence. This would provide the correct short-term impetus, but may not be a viable long-term policy.

Theorists point to the expectations-augmented AS curve discussed earlier as one explanation for the time-dependent change in the slope of the AS. As explained by the JoAnna Grey-Phelps model, in the short-term, in a world characterized by asymmetric information, when expectations of inflation do not actually match actual inflation, workers supply more labor. This additional labor, in turn, results in increases in output and employment that accompany increases in inflation, yielding the positively sloped expectations-augmented AS curve.¹³

However, over time, workers “catch on” and contract for higher nominal wages to keep their real wages constant. Information becomes symmetric and, as discussed, the AS becomes vertical, yielding the Rational Expectations AS curve. Furthermore, according to Robert E. Lucas’ seminal “islands” models (please see the following box), the rate at which the AS snaps back to its vertical position—the rate at which information becomes symmetric—is directly a function of the degree of attempted stabilization in an imperfect information environment.

This “synthesis view”, combining short-term Keynesian behavior with a long-term vertical AS curve, may explain why demand-side policies, such as changes in monetary growth that attempt to jump-start and soft-land economies, may be successful only for short periods in developed economies. Typically, these policies may be successful only at inflection points in the business cycle when growth is just about to lose momentum or the economy is on the verge of a recovery. Eventually, however, only structural changes in taxes, deregulation, and technology-induced productivity would be remedies

for long-term macroeconomic growth. (Keep in mind, this “synthesis” view is espoused by long-term expectationists/supply-siders).

Lending credence to this synthesis view are the actions of the Federal Reserve and the European Central Bank (ECB). After all, the attempt by the Federal Reserve to engineer a US soft-landing in 2000, and to deflate the housing bubble in 2004, by contracting monetary growth and increasing interest rates were “text-book” Keynesian policy prescriptions. So were the almost frantic attempts to jump-start growth with a sequence of significant interest rate cuts, beginning in 2001 and then in 2007 to prevent contagion from the rapidly deflating SAP bubbles. (The whole sub-prime saga and Fed policy traced back to 2000, is presented in detail in Article 11.3, in the following chapter.)

The European Central Bank, too, in spite of strident claims of only inflation control as its policy objective, has at times indulged in decidedly Keynesian behavior. It has lowered interest rates on several key occasions to invigorate growth in the larger German and French economies, despite strong signals of impending increases in inflation in the Eurozone. Since the ECB’s well publicized policy objective is to ensure that inflation in the Eurozone is at most 2 percent, these actions have led a growing body of central bank watchers to wonder if the major central banks, such as the ECB and the Fed, are indeed subscribing to a “synthesis” model that combines a Keynesian AS in the short-run and a vertical AS in the long-run.

Keynes famously said, “in the long-run we are all dead”. In the context of this section, it might appear that “in the long-run we may be either die-hard Keynesians or supply-siders, but in the short-run we are all Keynesians”.¹⁴ But Robert E. Lucas put an end to all that. In his view, presented next, even in the “short-run” there was no possibility of any Keynesian output-inflation tradeoff. Such a tradeoff was only a perceived tradeoff—any attempts to exploit it would only hasten the evolution to the vertical AS curve.

Explaining the Synthesis: Robert E. Lucas and his ‘Islands’ economy*

In, “Some International Evidence on Output-Inflation Tradeoffs,” (AER, 1973), Robert E. Lucas cleverly introduced the notion of imperfect information by constructing a radically new model—the “islands” economy—that soon spawned a whole new body of macroeconomic modeling. Here, producers scattered randomly over individual “islands” are independently able to observe price changes. They cannot, however, distinguish relative changes in prices from economy-wide nominal changes in prices. For example, when producer X sees an increase in price, he/she does not know if this change results from a real increase in excess demand for the product on the producer’s island, or if the price increase is simply due to an increase in inflation that affects all islands.

In the Lucas model, the producers cannot communicate with any other islands. Hence, given this imperfect information, they must hedge. If the price increase is indicative of excess demand for the product, then increases in output are warranted. In this case, the observed price increase would be accompanied by an increase in output, resulting in a positively sloped AS curve.

If, on the other hand, the price increase is perceived as simply due to an “ocean-wide” inflation that affects all islands, producer X would have no incentive or motivation to respond to this observed increase in price with an increase in supply. In this case, islanders promptly attribute any observed price increases to inflation caused by central bank monetization. Consequently, they do not increase output, resulting in a vertical AS curve.

Borrowing the concept of signal extraction from electrical engineering, Lucas found that economies with very disciplined monetary policies were indeed represented by AS curves that were positively sloped. (Monetary discipline was characterized by a central bank that had a history of not indiscriminately and constantly attempting to tweak the money supply or resort to vast debt monetization.)

On the other hand, in economies where monetary discipline was low, Lucas found that islanders attributed most (if not all) of the observed price increase simply to inflation, and the AS was indeed found to be steeper depending on the degree of monetary variance. In other words, in the Lucasian economy the slope of the AS was found to be inversely proportional to the degree of monetary discipline.

Perhaps most interestingly, Lucas’ model also demonstrated how expectations adjusted rapidly and efficiently. Positively sloped AS curves in economies known for their high monetary discipline would mercilessly adapt and get steeper at the first sign of a deterioration in monetary discipline. The AS curve would snap back to vertical, with the rate of adjustment directly proportional to the rate of deterioration in monetary discipline!

In terms of policy these findings have huge implications. Some economies may indeed be characterized by positively sloped AS curves by virtue of asymmetric information. However, the output-inflation tradeoffs are only perceived tradeoffs—they are not exploitable. Any attempts to exploit these tradeoffs would quickly result in the AS becoming vertical. The perceived tradeoff would rapidly disappear.

Many years later, this model was experimentally reconstructed with live “producers” in a simulated islands economy by the author (Journal of Economic Behavior and Organization, 1994). The “producers” (MBA and EMBA students) were located on “islands” characterized by imperfect information and subjected to prices from both disciplined as well as undisciplined monetary policies. The Lucas results were faithfully replicated. As in the Lucasian economy, the greater the monetary discipline, the flatter

the AS and the greater the perceived output-inflation tradeoff. As monetary discipline progressively deteriorated, the slope of the AS curves predictably increased. Eventually, producers simply began to ignore posted price increases, and the AS curves became vertical.

In conclusion, according to the synthesis view, there may be apparent tradeoffs in the short run driven by asymmetric information. The AS curve in the short run may indeed look like a conventional Keynesian AS curve, but the similarity ends there. Unlike its Keynesian counterpart, there is no long-run exploitable Phillips curve relationship. Instead, only a shimmering mirage of a Phillips curve is perceived here. The faster we attempt to approach this mirage, the more quickly it disappears. Therein lies the theoretical elegance of the Lucas islands model.

*** Robert E. Lucas Jr., of the University of Chicago, was the recipient of the Nobel Prize for Economics in 1995.**

10.9 THE OUTLOOK FOR THE NEW ECONOMY

Is the New Economy a one-time episodic event as claimed by the Keynesians, or is this a paradigm that is here to stay, albeit in a more sustainable version compared to the late 1990s? At the epicenter of this discussion lies the issue of the longevity of the productivity gains. These, after all, “drive” the New Economy.

How long will the productivity gains last? Have we entered a “phase 2” of the New Economy since 2001, with lower yet more sustainable productivity gains? Economic research has provided several insights into the matter.

1. The first issue, discussed earlier in this chapter, pertains to the nature of the productivity gains. Are they structural or cyclical? While the evidence is mixed and controversial, the general consensus is that until the economy has completed one real business cycle—boom followed by a real recession—it will be extremely difficult to sift out cyclical changes in productivity from structural ones.

2. A huge contributing factor to the New Economy was the massive drop in semiconductor prices in the early-mid 1990s. To some extent, this may have prevented inflation from increasing in proportion to the explosion in growth. Annual multifactor productivity growth (defined earlier) in the semiconductor sector was 30.7% from 1974-90, and 22.3% from 1990-95, and then it exploded to 44.0% from 1996-99 (Oliner and Sichel, 2000). Industry experts

(Jorgensen, 2001) expect price declines to continue well into the second decade of the new millennium.

3. The IT revolution, the centerpiece of the New Economy, may be just another breakthrough in a long series of technological revolutions. By the end of the 19th century, the widespread adoption of electricity was followed by the internal combustion engine. These inventions revolutionized travel (land and air), and manufacturing. In the 20th century, these breakthroughs were followed by others in medicine (vaccines, antibiotics) and communications (radio, television). If the IT revolution was then just another in a series of technological developments, expectations of a trend increase in the rate of growth may be unjustified. Rather, the IT economy could be interpreted as simply ensuring the sustainability of recent growth rates.

4. Finally, even if the IT economy is indeed different from preceding technological revolutions, it is not clear if the economy's long-term growth rate will be higher, or if just the level of national income will be ratcheted up, followed by the same long-term post World War II trend rate of growth (3-4%). Evidence from "phase 2" of the New Economy since 2001 seems to indicate a return to the long-term post World War II real rate of growth of the US economy. Once again, data from a full business cycle would be necessary to obtain any meaningful empirical estimates.

10.10 WHICH MODEL FOR DEVELOPED ECONOMIES?

The fact of the matter is that, in the United States, productivity numbers reminiscent of the 1960s were evidenced again in the late 1990s (the heyday of what has been labeled the "New Economy"). The causes and prospects of the New Economy have generated considerable interest from research as well as policy perspectives. Due to the identification problem, both paradigms, Keynesian as well as supply-sider, offer equally plausible explanations for the phenomenon labeled as the "New Economy". In addition, both models can also be found to fit a range of other macroeconomic outcomes in developed economies.

Against this macroeconomic backdrop, it remains to the reader to decide not just which model best explains the "New Economy", but also which model consistently explains all macroeconomic behavior in the developed economy that is being analyzed. In my macroeconomics classes, both paradigms are discussed in detail, and finally the students have to decide for themselves. While analyzing developed economies, they can choose to be either long-term Keynesians or long-term supply-siders; they can all be Keynesians in the short-run. (The choice is clear for emerging economies where the Keynesian paradigm applies in the short-term and the long-term.)

In some cases, the long-term choices for developed economies are based on the plausibility of the theoretical and technical assumptions underlying the

derivation of the model, or the logical and intuitive elegance of one paradigm relative to the other. The richness of the labor market and the clear policy implications of the Keynesian model are admired by many. Others are impressed by the elegant simplicity and the bold, uncluttered, policy strokes of the supply-side paradigm.

In other cases, individuals choose their model based on their own real-world experiences and instincts, or on moral and/or philosophical grounds. For example, the absence of a role for government intervention in macroeconomic stabilization may be seen by some to be highly desirable. The fundamental belief that market forces and not government intervention should determine business decisions, and that private enterprise must be allowed to compete freely and to succeed or perish in such an environment, resonates with the expectationists.

Others, however, may strongly believe that it “ought” to be government’s responsibility to be involved in activist macroeconomic policy, especially to cure unemployment. And there “should” be a minimum level of regulation to ensure that environmental, moral, and non-commercial concerns are not swept aside by unregulated businesses interests.

Both paradigms would agree that privatization and deregulation can indeed increase productivity. Both emerging and developed economies have pursued privatizations. While the intensity and determination with which privatizations are undertaken may be higher in supply-sider regimes, in enlightened emerging economies (China, India, Mexico, Brazil, to name a few), there is a growing conviction that state-owned enterprises (SOEs) eventually have to be allowed to “sink or swim” in the sea of global competition; a rightward shift in a Keynesian AS has undeniable merits.

After all the discussion throughout this book, and armed with the two diametrically different paradigms and their implications, the reader is finally equipped with all the tools for choosing the long-term paradigm for analyzing developed economies.

We now turn to questions that clarify and discuss some key concepts, followed by simulated media articles. The next chapter discusses the mechanisms by which central banks change interest rates, along with the objectives (and challenges) of prudent central bank policy in the global economy.

10.11 DISCUSSION QUESTIONS

- 1. Does the “synthesis” view imply that one need not adopt a polar model—Keynesian or Supply-sider—but could, instead, comfortably adopt the compromise version just described?**

The synthesis version is purely a short-run compromise driven by observed real-world macropolicy—especially monetary policy. As long as short-run imperfections and asymmetries in information exist, or as long as wage-contracts remain “sticky” (rigid) in the short-term, such tradeoffs will be successful. According to the expectationists, however, as the asymmetries disappear, the vertical AS will re-emerge along with its attendant supply-side oriented policies. As discussed earlier, Robert E. Lucas constructed his “islands economy” in 1973 to demonstrate that the greater the attempts to try and exploit information imperfections in the short-run, the faster the convergence of the economy to a vertical AS curve, and the quicker the demise of any perceived short-term tradeoff.

Of course, die-hard Keynesians would have no problem with the “synthesis” view in the short-run. In the long-run, however, they would advocate simply a continuance of the Keynesian policies. After all, for them the AS is positively sloped in both the short-run as well as the long-run.

2. If there are two diametrically different paradigms for developed economies, why do the bond market and often the stock market behave in a predominantly “Keynesian” fashion? For example, monetary policy announcements are immediately assumed to be fully capable of attaining the desired objectives regarding GDP, employment and inflation.

Bond markets in the US and in Europe certainly tend to display “Keynesian” tendencies. An announcement by the central bank that the short term rate will be lowered by, say, 50 basis points, is often seen as an indicator of greater GDP growth, greater employment, and an accompanying increase in the inflation rate. These indicators, after all, are hallmarks of Keynesian output-inflation tradeoffs. Typically, the yield curve might get steeper soon after the central bank’s announcement, as long bonds incorporate higher expected inflation resulting from the rate cut. Anticipation of renewed economic growth often results in a stock buying frenzy as investors re-enter the equity market, which may result in a spike in stock prices following a central bank announcement of looser monetary policy.

Conversely, immediately following an announced rise in interest rates, yield curves often get flatter as bond markets recognize the attempt by the central bank to cool down the economy by means of a monetary contraction. Expected inflation falls as a soft landing is expected, driving down long-term rates. Investors may take profits and sell out of a market on the verge of being slowed down, thereby causing a drop in stock prices, in this instance.¹⁵

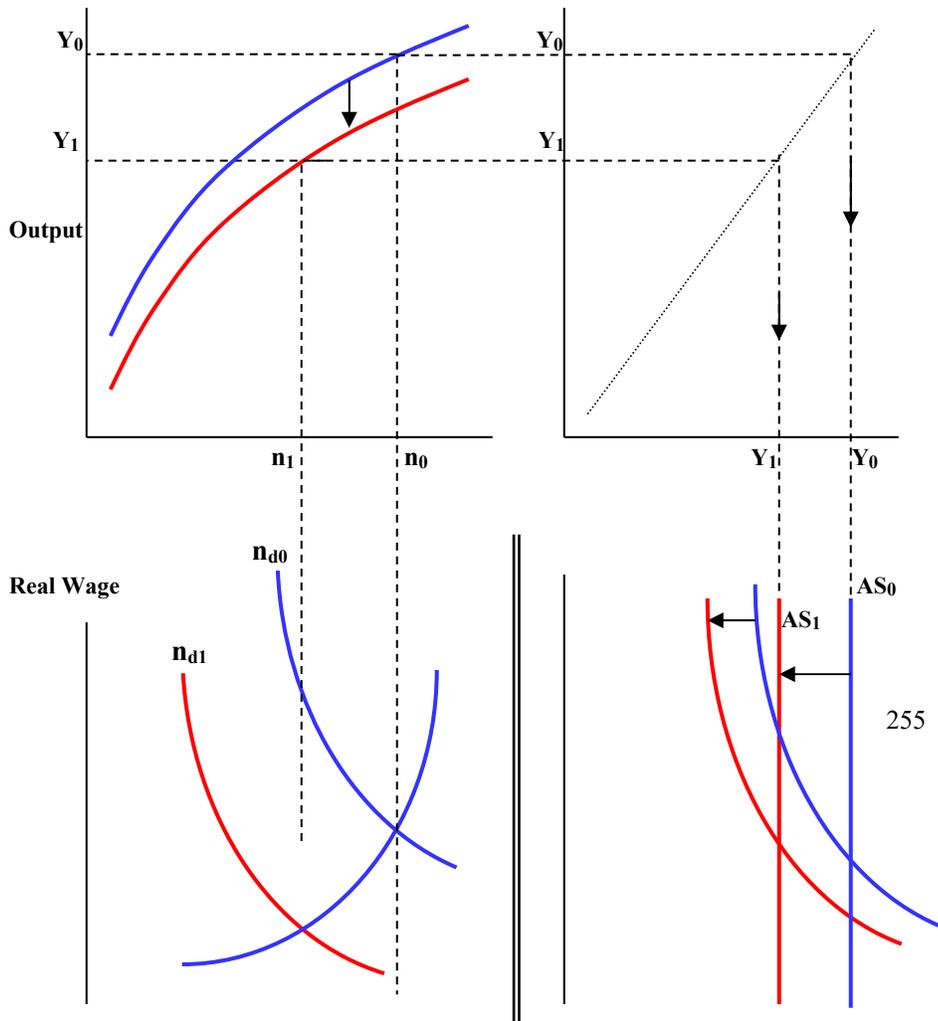
One can indeed make a case that stock and bond markets in most developed economies either are “mostly Keynesian”, or that these markets subscribe to the “synthesis” view and are Keynesian in the near-term.

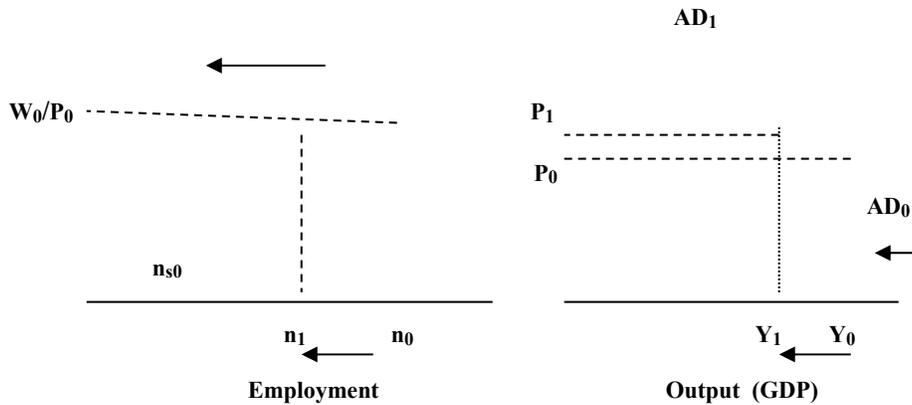
3. How would you explain a recession in the supply-side (New Economy) paradigm?

The labor market is the key to explaining a recession in the New Economy paradigm, presented in **Figure 11**. In the version done in this chapter, both labor supply and demand were functions of the real wages, tax rates, and a term labeled “macroeconomic outlook”. We discussed how cuts in taxes (personal and/or business) either shifted labor supply or labor demand to the right, and vice versa. To explain recessions, we now need to activate the “outlook” term.

Simply, the “macroeconomic outlook” is composed of forward-looking consumer and investor confidence. If the future looks bleak, the “outlook” term will decrease and labor demand will shift to the left as presented in Figure 11. The effect on labor supply is uncertain. Discouraged workers may simply opt out of the labor market, thereby removing themselves from the civilian labor force, or they may work more hours in anticipation of leaner financial times ahead. Hence, we leave labor supply curve unchanged. Equilibrium employment in the labor market will fall as labor demand shifts left. (The other shifts are described following Diagram 11).

Figure 11





From the production function diagram, as employment falls, output falls too, and this causes the vertical AS to shift to the left. Furthermore, the production function itself drops as the economy worsens. Typically employers tend to hold on to most of their workers until a recession is well under way. In doing so, each worker's output per hour (productivity) drops since the demand for the product has fallen in the slowing economy. Worsening macroeconomic conditions will also affect conventional consumer and investor confidence terms, \underline{C} and \underline{I} , which account for the drop in AD, as shown in Figure 11.

The final effect on inflation is ambiguous and depends on the relative magnitude of the AD and AS shifts.

In the following articles, please comment on the underlined passages using material presented in this and preceding chapters. Use diagrams liberally.

Article 10.1 SHIKOKU NEEDS LESS STIMULUS

Rohit Gupta, Aberdeen World News

Last weekend, Mr. Keichi Nagumo, Minister of Finance of the Republic of Shikoku, unveiled the country's most recent "economic stimulus" package. The event followed the graduation ceremony of the prestigious National Engineering Institute at the Koda Hotel. Even though the

event was studded with the usual luminaries, there was something missing—a real expectation of success was conspicuously absent from the proceedings.

In spite of the eighth stimulus package in six years, Shikoku, one of the most formidable economies of the recent past, remains mired

in recession with no end in sight. A total of 400 trillion units of domestic currency have already been **(a)** spent on gigantic infrastructure projects ranging from the Kaga desalination complex to one of the most modern airports in the world, not to mention the super high tech magnetic levitation (maglev) train system currently under development. But all these huge expensive projects have only managed to **(b)** nudge the economy from its severe bouts of deflation, up to about 2 percent inflation for short periods, before sinking back down again.

We interview Mr. Mitsubishi, who is enjoying a walk in the Fujimoro lotus gardens with his 5-year-old grandson. “We spend and spend, and I know that my hard earned savings are **(c)** being borrowed by our government to build expensive toys. But these are toys that we can’t use, and this is not what we need now. I have not worked in 18 months, and all my close friends are now out of work; all six of us once designed the best ships in the world. What will become of us?” he says keeping one watchful eye on his grandson who is feeding the ducks by the water’s edge.

Dr. Midori Konda, well-known author of Shikoku’s Agony stresses that “Its not just fiscal profligacy.” She points out, “They have **(d)** constantly hit the ‘money button’ to revive their economy, with the result that **(e)** interest

rates are virtually at zero percent! But nothing is happening! The central bank and the government are praying for a Keynesian recovery **(f)** but they’re praying in the wrong temple. It’s the wrong model, and the sooner they accept this the better!”

On Monday, at the Eastern Heaven Ice Cream Bar, we ran into owner, George Haromi, “Listen guys, I don’t need a PhD to figure this. The (central) bank **(g)** brought down the stock market with those crazy interest rate hikes four years ago, remember? And the country **(h)** went into chronic depression when the stock market collapsed. People’s entire retirements evaporated overnight—can you imagine? The elderly are wiped out—my wife’s mother had to move in with us. Why would you take a loan at a time like this—I’m an experienced businessman and **(i)** I’m not borrowing anything for a LONG time!” He then excused himself to scoop out Mango Mayhem ice-cream for two school-girls.

Now, Shikoku has yet another stimulus package, but there are no expectations of success. Despondency is epidemic. The bond market’s reaction did nothing to help; **(j)** rates sprang to 12 percent, as the government deficit/GDP ratio crossed over 10 percent. The **(k)** currency continues to plunge, hitting its 20-year low last Tuesday. So what can be done?

“Throw away the old model,” says Dr. Konda. “Politically this

will be tough, but we have to let all the sick companies and institutions die. We can't and shouldn't keep spending trillions to bail them out. Unemployment will get worse before it can get better. **(l)** Get government out of decisions on manufacturing, trade, and specialization. No more government subsidies, directives, or 5-year national plans. Order the **(m)** central bank to stop printing money at once. Shikoku needs less stimulus. Let the free market rule. **(n)** Unshackle the labor market by scrapping all the

employment regulation—this is vital. And most important, slash all business taxes significantly.”

Dr. Konda then flies off to Scotland for a conference in Aberdeen. This reporter and his camera crew decide to walk by the Eastern Heaven. There are no customers. It is a nice evening. A cool breeze blows in from the bay. George Haromi sees us and waves us in. “Here, have some free Mango Mayhem,” he beams, as he hands us small ice cream cones.

Maybe things are looking up after all.

Article 10.2 IMPLICATIONS OF THE “NEW” ECONOMY

Jesse Cohen, Kansas City Financial Examiner

“The implications go way beyond academic discussion,” intones Dom Panelli, at the National Policy Bureau’s Conference on the New Economy in Flemington, NJ. “What we have here is a fundamental sea change in policies prescribed by respective governments and in the way we do business.”

With the elections never too far away in the US, this opinion has profound implications. Panelli’s comment is countered by an article published by Policy Today that insists that it was **(a)** low interest rates, cheaper imports, and a “one time boost in productivity” that resulted in the New Economy. This kind of thinking is immediately chall-

enged by last month’s Engineering Outlook which presents rigorously measured productivity numbers in virtually all major sectors. Most areas show a huge jump since the late 1990s, and all **(b)** indicate no slowdown in their growth rates. In view of this backdrop of conflicting data, believers on both sides remain adamant.

As the experts debated the issues, this newspaper took the matter to the practitioners. Art Vandalay, Director of JKV, an Oklahoma-based wireless biometric equipment manufacturer, says, “This whole industry basically grew overnight, and we haven’t even scratched the surface. Technology has a long way to go, and we are coming up with more

potentially path-breaking innovations literally on a daily basis.” He vehemently adds, “I have been an engineer for 34 years, and I know that we are in a new phase since the IT explosion of the 1990s. My only problem is getting enough skilled labor to keep pace with the new ideas.”

Jerry Kitsmiller, controller at Cyber Lock, an encryption company in Richmond, adds an ominous note. “This new world of e-commerce fueled by the internet is real. No doubt about that. But it can come crashing down if these folks in Washington enact **(c)** even more legislation to regulate our industry. It worries me a lot....stagflation would be terrible.”

But at StatsOnLine, the global statistical analysis giant, Perin Guzder admits, **(d)** “We can’t say for sure if it was monetary policy against a backdrop of favorable world events that ‘caused’ the New Economy, or some big technological revolution set in a new paradigm”.

This was not good enough for Isabella Soprano, researcher at the Carson Mountain Radio Telescope in Colorado. “We can detect an object as small as an electric golf cart at the edge of the universe, and those **(e)** folks can’t write a program to find out which ‘model’ works? Come on! Get serious!”

In Ireland, a similar debate has long been under way. **(f)** Did huge transfers from the rich European Union countries “cause” Ireland’s remarkable growth, or was it textbook supply-side economics leading to the New Economy? “I admit that the transfer did help enormously. And the tax cuts could also be called ‘old economy,’ but **(g)** I really think that huge pro-business initiatives and the fact that our government has stopped meddling in the economy may have given us our miracle,” says Mike Kelly, bartender at the Celtic Rebel pub in Dublin, as we waited for the heads on our glasses of Guinness to stop rising.

The mood has spread globally. In China, Jiao Xianquan, President of the Shanghai Consortium of Business told us, “We really must **(h)** privatize our key sectors, force them to compete globally, allow our bright young men and women to take risks and unleash their minds and energies.”

All are not convinced. Dr. Mica Fischer, Chairman of the Dresden Group in Dresden, Germany, scoffed at the debate in a television debate last night.

(i) “There is nothing to debate. We raise interest rates, things slow down, and unemployment goes up. We lower rates, the opposite happens. End of story. Nothing ‘new’ about this New Economy!”

10.3 The following are major discussion topics/issues pertaining to the supply-side paradigm.

- (1) “The supply-sider model is just a transitory fix. Once the deregulation is all done, then what happens? What drives the growth then?” True/False? Comment.
- (2) “This emphasis on technology is misplaced. Keep in mind, we have diminishing returns to technology—I mean, how small a mobile phone will we finally make? Will I rush out and buy a new laptop just because it might be just a little faster? Or a new iPod just because the new design looks prettier and can store a million tunes?” True/False? Comment.
- (3) “How can supply-siders explain bubbles and overheating at some ‘Y max’? In their world there is no such thing as maximum capacity! But we all know that bubbles and capacity constraints do indeed exist!” Comment.
- (4) “The supply-side model is useless. Note how the US went totally Keynesian after 9/11!” Comment.
- (5) “Why do giant companies like Dell and Walmart insist that they are products of the supply-side paradigm? What is this connection with the supply-side model and supply chain management (SCM)?”
- (6) “Free trade is vital to supply-siders. But how can we trade freely if other countries copy our knowledge-intensive products such as new software, R&D, music, etc.?” Comment
- (7) “If free trade is vital to the supply side paradigm, then we should use tax revenues to subsidize key sectors and to champion new exports. By this strategy, we will capture global market share, and these champion products and technologies will be the vanguard of our growth for the next ten years or so.” Comment.

ANSWERS AND HINTS

Article 10.1 Shikoku Needs Less Stimulus

- (a) This illustrates the basic Keynesian fiscal multiplier driven by large infrastructure spending.
- (b) As AD is shifted right, inflation is pushed up as the economy barely enters Stage 2 of demand-pull inflation....but then the AD drops back down....why is this happening? (Please be sure to read through the whole article before answering.)

- (c) This is typical bond-financed government deficit spending. What may be some factors causing manufacturing and heavy industry to bear the brunt of the slowing economy?
- (d) and (e) Monetary stimulus has also been relentlessly applied. As money supply has increased, interest rates have progressively fallen, until apparently they are now close to zero. Both G and M were increased to attempt a rightward shift in AD . Use diagrams to explain how these policies were supposed to have revived Shikoku's economy.
- (f) Could Shikoku be in the throes of a paradigm shift? Use diagrams to explain.
- (g) Sounds like the central bank contracted monetary policy to deflate a potential SAP bubble in the stock market—and succeeded. Apparently the contraction in M was severe. Use diagrams here.
- (h) It is hardly surprising that the collapse in perceived wealth following the central bank's bursting of the SAP bubble has led to plunges in \underline{C} and \underline{I} .
- (i) This relates to low \underline{I} . A healthy demand for loanable funds is crucially dependent on investor confidence and not just on interest rates, as discussed in earlier chapters. Even though interest rates are close to zero in this economy, expectations of future growth are dismal. Investor confidence is at rock bottom, and businesspersons like George are not even contemplating any borrowing.
- (j) Central bank policy directly influences very short-term interest rates. However, long-term rates, as discussed in earlier chapters, are endogenous. Use this fact, coupled with Shikoku's deficit/GDP ratio, to explain the rise in "rates" to 12 percent.
- (k) An exodus of capital into safer and healthier economies results in investors selling domestic currency to purchase assets denominated in foreign (hard) currency. This causes the domestic currency to plunge.
- (l) A smaller role for government is advocated here; deregulation is the mantra. This is clearly a supply-side proposal.
- (m) Further emphasis on the supply-side. Basically, demand-side fiscal and monetary stabilization is not effective any more. The paradigm has shifted. The emphasis ought to be on attempting to shift the aggregate supply curve instead of the aggregate demand curve. Illustrate, using diagrams.
- (n) These are textbook supply-side policies. Deregulation is vital—especially in the labor market. And tax cuts are absolutely necessary to a supply-side stimulus. Illustrate, using diagrams.

Article 10.2 Implications of the "New" Economy

- (a) Dom Panelli is referring to the Keynesian explanation for the New Economy. Use diagrams to explain.

- (b) This is the supply-side perspective. Productivity growth is real, ongoing, and here to stay. The New Economy is not an episodic one-time event.
- (c) Use the set of four diagrams (production function, labor market, reflector and (P,Y) space) to show how, in this supply-sider perspective, an increase in government regulation could result in stagflationary effects.
- (d) Why can't statistician Perin Guzder "say for sure"? Use diagrams.
- (e) It is not technical deficiency, but the nature of the time-series data that results in the problem.
- (f) Was it just an increase in donor-funded government spending in Ireland that produced a nice Keynesian recovery in that country?
- (g) Or was it a genuine supply-side stimulus? Refer to the chapter.
- (h) Here is an example of attempts to generate a shift in the AS even though the economy may almost certainly be Keynesian.
- (i) In the short-run we can all be Keynesians. But in some economies, we cannot perpetually exploit short-run tradeoffs based on imperfections or rigidities. If the AS eventually becomes vertical (according to long-term supply-siders), the output-inflation tradeoff ceases to exist. Furthermore, according to Robert E. Lucas, in this case the more we try to exploit short-term tradeoffs, the faster will they converge to vertical AS world.

¹ In this chapter and the remainder of this book, rational expectationists and supply-siders will be used interchangeably. Technically, in the context of this chapter, rational expectationists were the theoretical macroeconomists who constructed fundamental mathematical models that validated the paradigm shift. Their supply-sider colleagues then prescribed real-world macroeconomic policies consistent with this new rational expectations model.

² The model presented here is a synthesis of the JoAnna Grey/Phelps class of asymmetric information models that were key in the early development of the paradigm shift. Once again, in keeping with the policy-driven focus of this book, the theoretical aspects are de-emphasized to make way for expositional convenience and intuition.

³ The numbers used for P_1 and W_1 are purely for discussion. The point is that increases in nominal wages do not match increases in prices, and this disparity leads to an erosion of the real wage.

⁴ This AS is also called the adaptive expectations AS curve.

⁵ The asymmetric information theory for a positively sloped AS is only one of several theories. Another explanation is the rigidity in long-term nominal wage adjustments caused by long-term wage contracts. According to this theory, unexpected increases in inflation in a labor market characterized by fairly rigid long-term contracts will have the same effect as in our model. Once again, nominal wage increases will not match increases in inflation, resulting in a positively sloped AS.

⁶ This is the view propounded by the expectationists. Later, in this chapter, the Keynesian explanation of the "so-called" paradigm shift will be discussed.

⁷ Paradigms, in the context of this chapter, are basically differentiated by their AS curves. ISLM space and the AD curve are identical for both Keynesian as well as RE-AS models. It is only the AS curves derived from crucial assumptions in their respective labor markets that separate the two major paradigms.

⁸ Both oil shocks have been combined into one “composite” shock as shown in the diagram.

⁹ US macroeconomic statistics during the stagflationary bouts in the 1970s were indeed bleak, and included double-digit inflation and unemployment. Relate stagflation to the earlier discussion on cost-push inflation, where similar countercyclical movements in prices and GDP were discussed.

¹⁰ The AD shifts are independent of the AS curve, and hence are identical in 9a and 9b.

¹¹ The problem exists primarily in developing economies because these economies are almost certainly Keynesian. Developing economies are characterized by excess labor supply and the inability of this excess labor supply to enforce and influence nominal wage contracts. Information is imperfect and asymmetric, and there is an absence of efficient bond-markets that signal expected inflation. All these characteristics point to Keynesian models as “default” paradigms for emerging and even for newly industrialized economies.

¹² Mainstream macroeconomics texts by authors such as Michael Parkin and Richard Froyen also propose short-term and long-term AS and Phillips curves.

¹³ In the example where prices went from 2 to 5 while wages only went from 12 to 15. Here workers did not “see” the increase in price—they only “saw” their nominal wage increases from 12 to 15 in the short run, and responded by supplying more labor. Thus, output increased with increases in price, resulting in a positively sloped AS.

¹⁴ In this section, we deliberately shy away from specific definitions of short- and long-run. The point is that information asymmetry can exist only for so long. Eventually, workers will know all pieces of information. And besides, this process may be of different duration in different economies. An economy with a more sophisticated labor market will go from short to long-run far more quickly than one with a less developed economy possessing a less sophisticated labor market.

¹⁵ This assumes that all other macroeconomic factors—tax rates, government spending, confidence, foreign GDP—remain constant and dormant. This is a purely linear, simplified causality from interest rate announcements to typical long-bond and stock market behavior, immediately following the Fed’s announcement.