READING

15

Understanding Business Cycles

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LEARNING OUTCOMES

Mastery	*The candidate should be able to:*
☐	**a.** describe the business cycle and its phases;
☐	**b.** describe how resource use, housing sector activity, and external trade sector activity vary as an economy moves through the business cycle;
☐	**c.** describe theories of the business cycle;
☐	**d.** describe types of unemployment and compare measures of unemployment;
☐	**e.** explain inflation, hyperinflation, disinflation, and deflation;
☐	**f.** explain the construction of indexes used to measure inflation;
☐	**g.** compare inflation measures, including their uses and limitations;
☐	**h.** distinguish between cost-push and demand-pull inflation;
☐	**i.** interpret a set of economic indicators and describe their uses and limitations.

INTRODUCTION 1

Agricultural societies experience good harvest times and bad ones. Weather is a main factor that influences crop production, but other factors, such as plant and animal diseases, also influence the harvest. Modern diversified economies are less influenced by weather and diseases but, as with crops, there are fluctuations in economic output, with good times and bad times.

This reading addresses changes in economic activity and factors that affect it. Some of the factors that influence short-term economic movements—such as changes in population, technology, and capital—are the same as those that affect long-term sustainable economic growth. Other factors, such as money supply and inflation, are more specific to short-term economic fluctuations.

This reading is organized as follows. Section 2 describes the business cycle and its phases. The typical behaviors of businesses and households in different phases and transitions between phases are described. Section 3 provides an introduction to business cycle theory, in particular how different economic schools of thought interpret the business cycle and their recommendations with respect to it. Section 4 introduces basic concepts concerning unemployment and inflation, two measures of short-term economic activity that are important to economic policymakers. Section 5 discusses variables that demonstrate predictable relationships with the economy, focusing on variables whose movements have value in predicting the future course of the economy. A summary and practice problems conclude the reading.

2 OVERVIEW OF THE BUSINESS CYCLE

Burns and Mitchell (1946) define the business cycle as follows:

> Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence of events is recurrent but not periodic; in duration, business cycles vary from more than one year to 10 or 12 years.

This long definition is rich with important insights. First, business cycles are typical of economies that rely mainly on business enterprises—therefore, not agrarian societies or centrally planned economies. Second, a cycle has an expected sequence of phases, alternating between expansion and contraction. Third, such phases occur at about the same time throughout the economy—that is, not just in agriculture or not just in tourism but in almost all sectors. Fourth, cycles are recurrent (i.e., they happen again and again over time) but not periodic (i.e., they do not all have the exact same intensity and/or duration). Finally, cycles typically last between 1 and 12 years.

Although Burns and Mitchell's definition may appear obvious in part, it indeed remains helpful even more than 60 years after it was written. Although "rules of thumb" are often referred to when talking about market activity (e.g., shares always rally in January and big crashes occur in October), reality is much more complex. As Burns and Mitchell remind us, history never repeats itself in quite the same way, but it certainly offers patterns that can be used when analyzing the present and forecasting the future.

2.1 Phases of the Business Cycle

A typical business cycle consists of four phases: trough, expansion, peak, contraction. The period of **expansion** occurs after the **trough** (lowest point) of a business cycle and before its **peak** (highest point). The peak and trough represent turning points in the cycle. **Contraction** is the period after the peak and before the trough.[1] During the expansion phase, aggregate economic activity is increasing (*aggregate* is used because

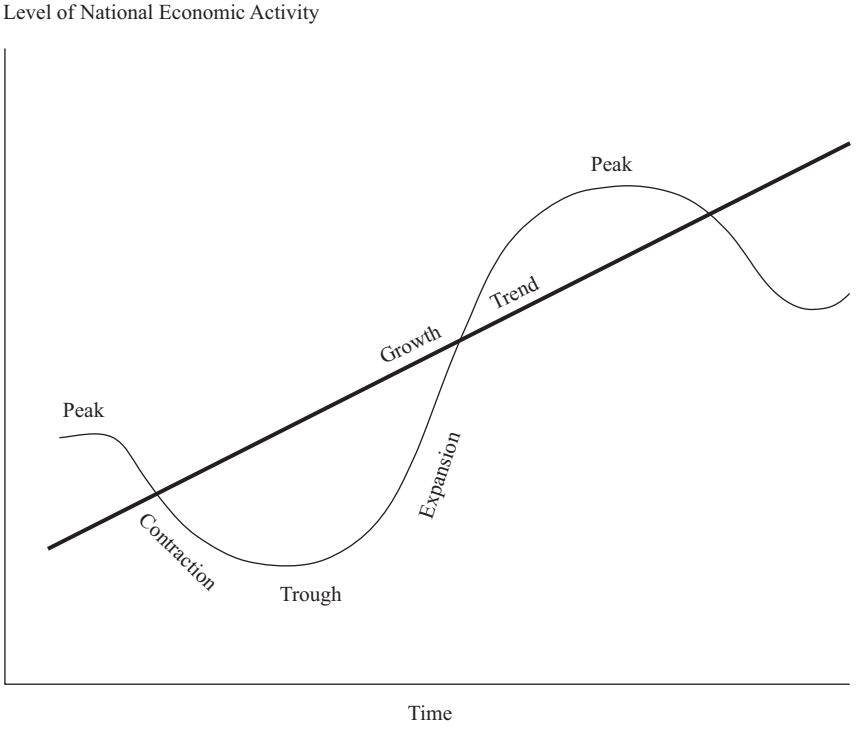
1 For more information, see www.nber.org/cycles/recessions.html.

some individual economic sectors may not be growing). The contraction—often called a **recession**, but may be called a **depression** when exceptionally severe—is a period in which aggregate economic activity is declining (although some individual sectors may be growing). Business cycles can be thought of as fluctuations around the trend growth of an economy.

Exhibit 1 Panel A shows a stylized representation of the business cycle. Panel B provides a description of some important characteristics of each phase. The description distinguishes between early and late stages of the expansion phase. The early stage is closer to the trough and the late stage is closer to the peak. Exhibit 1 Panel B also describes how several important economic variables evolve through the course of a business cycle.

Exhibit 1

Panel A: Representation of a Business Cycle



(continued)

Exhibit 1 (Continued)

Panel B: Characteristics

	Early Expansion (Recovery)	Late Expansion	Peak	Contraction (Recession)
Economic Activity	■ Gross domestic product (GDP), industrial production, and other measures of economic activity stabilize and then begin to increase.	■ Activity measures show an accelerating rate of growth.	■ Activity measures show decelerating rate of growth.	■ Activity measures show outright declines.
Employment	■ Layoffs slow but new hiring does not yet occur and the unemployment rate remains high. Business turns to overtime and temporary employees to meet rising product demands.	■ Business begins full time rehiring as overtime hours rise. The unemployment rate falls.	■ Business slows its rate of hiring. The unemployment rate continues to fall but at a decreasing rate.	■ Business first cuts hours and freezes hiring, followed by outright layoffs. The unemployment rate rises.
Consumer and Business Spending	■ Upturn in spending often most pronounced in housing, durable consumer items, and orders for light producer equipment.	■ Upturn in spending becomes more broad-based. Business begins to order heavy equipment and engage in construction.	■ Capital spending expands rapidly, but the growth rate of spending starts to slow down.	■ Decreased spending most evident in industrial production, housing, consumer durable items, and orders for new business equipment.
Inflation	■ Inflation remains moderate and may continue to fall.	■ Inflation picks up modestly.	■ Inflation further accelerates.	■ Inflation decelerates but with a lag.

The behavior of businesses and households frequently incorporates leads and lags, relative to what are established as turning points in a business cycle. For example, at the beginning of the expansion phase, companies may want to fully use their existing workforce and wait to hire new employees until they are sure that the economy is indeed growing. However, gradually all economic variables are going to revert toward their normal range of values (e.g., GDP growth will be a positive number). As the economy returns to normal, any countercyclical economic policies adopted by a central bank (the monetary authority in most modern economies) are gradually phased out. For example, if the central bank reduced interest rates to stimulate the economy during a recession, it may start increasing rates toward their historical norms.

During a recession, investors place relatively high values on such safer assets as government securities and shares of companies with steady (or growing) positive cash flows, such as utilities and producers of staple goods. Such preferences reflect the fact that the marginal utility of a safe income stream increases in periods when employment is insecure or declining. When asset markets expect the end of a recession and the beginning of an expansion phase, risky assets will be repriced upward. When an expansion is expected, the markets will start incorporating higher profit expectations into the prices of corporate bonds and stocks, particularly those of such cyclical companies as producers of discretionary goods, for example automobiles. Typically,

equity markets will hit a trough about three to six months before the economy bottoms and well before the economic indicators turn up. Indeed, the equity stock market is classified as a leading indicator of the economy.

When an economy's expansion is well established, a later part of an expansion called a **boom** often follows. The boom is an expansionary phase, which is characterized by economic growth "testing the limits" of the economy. For example, companies may expand so much that they have difficulty finding qualified workers and will compete with other prospective employers by raising wages. The resulting rise in labor costs may lead to a reduction of profits. Another example is that companies may begin to believe that the economy will continue expanding for the foreseeable future and decide to borrow money to expand their production capacity. The government and/or central bank may step in if it is concerned about the economy overheating. Consider the following situation. The central bank is concerned that excessive salary growth may lead to inflation. For example, companies will try to pass on higher production costs to their customers or excessive borrowing may cause investors to have cash flow problems. At the height of the boom phase, the economy is said to be overheating (just like the engine of a car that has been pushed to an excessive level).

During the boom, the riskiest assets will often have substantial price increases. Safe assets, such as government bonds that were more highly prized during the recession, may have lower prices and thus higher yields. In addition, investors may fear higher inflation, which also contributes to higher nominal yields.

The end of the expansion, or boom, is characterized by the peak of the business cycle, which is also the beginning of the contraction (also known as downturn). Here, either because of restrictive economic policies established to tame an overheated economy or because of some other shock, such as energy prices or a credit crisis, the economy stumbles and starts slowing down. Unemployment increases and GDP growth decreases during this part of the business cycle.

EXAMPLE 1

When Do Recessions Begin and End?

A simple and commonly referred to rule is: A recession has started when a country or region experiences two consecutive quarters of negative real GDP growth. Real GDP growth is a measure of the "real" or "inflation-adjusted" growth of the overall economy. This rule can be misleading because it does not indicate a recession if real GDP growth is negative in one quarter, slightly positive the next quarter, and again negative in the next quarter. Many analysts question this result. This issue is why, in some countries, there are statistical and economic committees that apply the principles stated by Burns and Mitchell to several macroeconomic variables (and not just real GDP growth) as a basis to identify business cycle peaks and troughs. The National Bureau of Economic Research (NBER) is the well-known organization that dates business cycles in the United States. Interestingly, the economists and statisticians on NBER's Business Cycle Dating Committee analyze numerous time series of data focusing on employment, industrial production, and sales. Because the data are available with a delay (preliminary data releases can be revised even one year after the period they refer to), it also means that the Committee's determinations may take place well after the business cycle turning points have occurred. As we will see later in the reading, there are practical indicators that may help economists understand in advance if a cyclical turning point is about to happen.

1 Which of the following rules is *most likely* to be used to determine whether the economy is in a recession?

A The central bank has run out of foreign reserves.

B Real GDP has two consecutive quarters of negative growth.

C Economic activity experiences a significant decline in two business sectors.

2 Suppose you are interested in forecasting earnings growth for a company active in a country where no official business cycle dating committee (such as the NBER) exists. The variables you are *most likely* to consider to identify peaks and troughs of a country's business cycle are:

A inflation, interest rates, and unemployment.

B stock market values and money supply.

C unemployment, GDP growth, industrial production, and inflation.

Solution to 1:

B is correct. GDP is a measure of economic activity for the whole economy. Changes in foreign reserves or a limited number of sectors may not have a material impact on the whole economy.

Solution to 2:

C is correct. Unemployment, GDP growth, industrial production, and inflation are measures of economic activity. The discount rate, the monetary base, and stock market indexes are not direct measures of economic activities. The first two are determined by monetary policy, which react to economic activities, whereas the stock market indexes tend to be forward looking or leading indicators of the economy.

Investors, who are often optimists in the expansion phase, tend to be overly pessimistic at the bottom of the business cycle. It is worth noting that in many business cycles, the duration of economic contractions have been shorter than the duration of expansions.

Many economic variables and sectors of the economy have distinctive cyclical patterns. Knowledge of these patterns can offer insight into likely cyclical directions overall or can be particularly applicable to an investment strategy that requires more specific rather than general cyclical insights for investment success. The following sections provide overviews of how the use of resources (the factors of production) typically evolves through the business cycle and how the sectors of real estate and external trade characteristically behave.

2.2 Resource Use through the Business Cycle

This section provides a broad overview of how the use of resources needed to produce goods and services typically evolves during a business cycle.

There are significant links between fluctuations in inventory, employment, and investment in physical capital with economic fluctuations. When a downturn starts, aggregate demand decreases, and as a result, inventories may start to accumulate. Companies may slow production and have equipment that is being used at less than full capacity. Subsequently, companies are likely to stop ordering new inventories and new production equipment.

Companies do not necessarily reduce their workforces immediately; instead, they reduce costs by other means, such as eliminating overtime. If it is just a temporary economic slowdown, retaining workers that are not being fully utilized may be a better alternative than firing workers and replacing them later. Finding and training

new workers is costly and it may be more cost efficient to keep workers on the payroll, even if they are not fully utilized, while waiting out a short period of slow business. Second, some economists suggest that there is an implicit bond of loyalty between a company and its workers, and thus workers will be more productive if they know that the company is not disposing of them at the first sign of economic trouble.

If the downturn becomes more severe, companies will start reducing costs more aggressively, cutting all non-essential costs. This step often means terminating consultants, workers beyond the strict minimum, standing supply orders, advertising campaigns, and so on. Capacity utilization will be low, and few companies will invest in new equipment and structures. Companies will try to liquidate their inventories of unsold products. In addition, banks will be reluctant to lend because bankruptcy risks are perceived to be higher. As a result, the economy enters what seems to be a downward spiral.

The gap between the recession output (GDP_R) and the potential output (GDP_P), the level of real GDP that could be achieved if all resources were fully utilized, is an indicator of slack resources (unemployment for labor and idleness for physical capital). Decreases in aggregate demand are likely to depress wages or wage growth as well as prices of inputs and capital goods. After a while, all of these input prices will be relatively very low. In addition, the monetary authority may cut interest rates to try to revive the economy.

As the prices and interest rates decrease, consumers and companies may begin to purchase more and aggregate demand may begin to rise. Companies may increase production as a result of increased demand and low levels of inventory of finished products. Also, because interest rates have fallen, some companies and households may decide to start investing in structures, housing, and durable goods (equipment for companies, appliances for households). This stage is the turning point of the business cycle; aggregate demand starts to increase and economic activity increases.

When economic activity increases, companies are unlikely to immediately start the costly process of selecting and hiring new workers. They may wait for the expansion to give clear signs of life. However, if enough new investment triggers an increase in aggregate demand, companies will start replenishing their inventories of finished products. This replenishment will increase the demand for intermediate products, which will further increase aggregate demand. This stage is often called inventory rebuilding or restocking in the financial press and may be followed by additional increases in capital expenditures. Demand for all factors of production—land, labor, materials, and physical capital—increases.

As aggregate demand continues to grow, a boom phase of the cycle begins. In a boom phase, the economy may experience shortages and the demand for factors of production may exceed supply. It is possible that the excess demand is triggered by overly optimistic expectations of demand for products, which means that the supply of physical capital and production capacity may exceed the demand for products in the future. Past examples of excessive supply attributable to overinvestment include fiber optic infrastructure during the 1990s technology boom and residential overbuilding in many countries during the 2000s housing bubble. This overinvestment, which results in unused productive capacity, are possible triggers for the next recession.

2.2.1 *Fluctuation in Capital Spending*

This section describes how capital spending—spending on tangible goods, such as property, plant, and equipment—typically fluctuates with the business cycle. Because business profits and cash flows are sensitive to changes in economic activity, capital spending is also sensitive to changes in economic activity. Shifts in capital spending tend to affect the overall economic cycle in three stages or phases.

In the early stage of a contraction, the downturn in spending on equipment usually occurs abruptly as demand for companies' products starts to decrease. Businesses, seeing a decline in sales and expecting a drop in profits and free cash flow, will halt new ordering and may even cancel existing orders because there is no perceived need to expand production capacity. The initial cuts typically occur in orders for technology and light equipment because there are shorter lead times from order to delivery and managers may simply not place any additional orders. It often takes longer to cancel or halt construction activity or the installation of larger, more complex pieces of equipment, and cutbacks in these areas unfold with a longer lag. Typically, the initial cutbacks at this stage exaggerate the economy's contraction. Then later, as the general cyclical downturn matures, cutbacks in spending on structures and heavy equipment further intensify the contraction.

In the early stages of an expansion, when the economy begins its recovery, sales are still at such low levels that a business is likely to have excess productive capacity and has little need to expand it. But although capacity utilization remains low, capital spending may begin to increase. There are two primary reasons underlying the increase in capital spending. One, growth in earnings and free cash flow attributable to the economic improvement gives businesses the financial ability to increase spending. Two, the upturn in sales may convince managers to reinstate some orders that had been canceled. Typically, the orders initially reinstated are for equipment with a high rate of obsolescence, such as software, systems, and technological hardware. This type of equipment is likely to enhance efficiency more than expand capacity; enhancing efficiency may be the initial focus of new orders. An increase in new orders for equipment to enhance efficiency often provides the first signal of recovery. Because orders precede actual shipments and possibly payments, an emphasized and widely watched indicator of the future direction of capital spending is orders for capital equipment.

In the later stage of expansion, productive capacity may begin to limit ability to respond to demand. Orders and sales at this stage focus on capacity expansion and increasingly are for heavy and complex equipment, warehouses, and factories. Spending on new capacity may begin before capacity seems to need additions. This seeming disconnect occurs because there can be a long lag between order and delivery or completion of heavy and complex equipment, warehouses, factories, and so on. Also, because economies are always changing their needs, physical capital that counts as capacity in the statistics may be less relevant to current production needs even though the underlying assets remain fully serviceable. The composition of the economy's capacity may not be optimal for the current economic structure, necessitating spending for new capital. A company, for instance, that needs more transportation equipment cannot substitute with a surplus of forklifts, although they are counted in overall capacity. Similarly, a company that needs warehouse space in the suburbs of Mumbai benefits little from its surplus warehouse space in Goa. The increase in capital spending to increase capacity may occur surprisingly soon after capacity utilization picks up. New orders intended to increase capacity may be an early indicator of the late stage of the expansion phase.

EXAMPLE 2

Capital Spending

1 The most likely reason that US analysts often follow new orders for capital goods excluding defense and aircraft is because:

A the military is part of the public sector.

B aircraft and defense equipment orders are often the same so there is double counting.

C armed forces and airlines tend to place infrequent and large orders, which create a false signal for the index.

2 Orders for equipment decline before construction orders in a recession because:

A businesses are uncertain about cyclical directions.

B they are easier to cancel than large construction contracts.

C business values light equipment less than structures and heavy machinery.

Solution to 1:

C is correct. Business cycle indicators need to represent the activities in the whole economy and thus should not be influenced by some particular sectors that may have uncorrelated fluctuations.

Solution to 2:

B is correct. Because it usually takes much longer time to plan and complete large construction projects than for equipment orders, construction projects may be less influenced by business cycles.

Note: New orders statistics include orders that will be delivered over several years. For example, it is common for airlines to order 40 airplanes to be delivered over five years. Therefore, analysts use "core" orders that exclude defense and aircrafts for a better understanding of the economy's trend.

2.2.2 *Fluctuation in Inventory Levels*

Inventory accumulation and cutbacks by businesses can occur with such speed and frequency that they have a much greater effect on economic growth than justified by their relatively small aggregate size relative to the economy as a whole. A key indicator in this area is the inventory–sales ratio that measures the inventories available for sale to the level of sales. The interaction of this gauge with the cycle develops in three distinct stages.

Toward the peak of the economic cycle, as sales fall or slow, businesses may lag in cutting back on new production and inventories increase. The lower sales combined with higher inventories result in an increase in inventory–sales ratios. This apparent increase in inventories may hide signs of a weakening economy. Practitioners (investment analysts and others) look for measures that focus on what are commonly called "final sales," which exclude the effects of inventory changes. To adjust and sell off these unwanted inventories, a business may cut production below even the reduced sales levels. This cut in production causes subsequent indicators in the overall economy to look weaker than they otherwise might have been. Although final sales offer a reality check, the production cutbacks involved in reducing inventory levels may lead to order cancellations and layoffs by producers that may subsequently cut final sales further and deepen cyclical corrections.

With businesses producing at rates below the sales volumes necessary to dispose of unwanted inventories, inventory–sales ratios begin to fall back toward normal. When these indicators return to acceptable levels and businesses no longer have any need to further reduce inventories, they will raise production levels. The increase in production results in a seemingly improved economic situation, even if sales remain depressed. Again, final sales may provide a more realistic picture of the underlying economic situation. At this phase in the cycle, the seemingly minor increase in production levels can actually mark the beginning of the cyclical turn because layoffs may slow or stop and demand for other inputs may also increase.

As sales begin their cyclical upturn, a business may initially fail to keep production on pace with sales, which causes it to lose inventory to the initial sales increase. The subsequent fall in inventory–sales ratios, when it occurs in the face of rising sales, quickly prompts a surge in production not only to catch up with sales but also to replenish depleted inventories. However, sometimes during short or severe recessions, when businesses have not had time to adjust or reduce inventories to acceptable levels, companies may initially consider increased production unnecessary. As a result, the lag between increased sales and production may be longer than in other cycles. But whether the production upturn occurs with a short or a long lag, it typically marks a turn in hiring patterns and for a time can markedly exaggerate the cyclical strength.

EXAMPLE 3

Inventory Fluctuation

1 Although a small part of the overall economy, changes in inventories can influence economic growth measures significantly because they:
   - **A** reflect general business sentiment.
   - **B** tend to move forcefully up or down.
   - **C** determine the availability of goods for sale.
2 Inventories tend to rise when:
   - **A** inventory–sales ratios are low.
   - **B** inventory–sales ratios are high.
   - **C** economic activity begins to rebound.
3 Inventories will often fall early in a recovery because:
   - **A** businesses need profit.
   - **B** sales outstrip production.
   - **C** businesses ramp up production because of increased economic activity.

Solution to 1:

B is correct. As stated in the reading, inventory level fluctuates dramatically over the business cycle.

Solution to 2:

A is correct. When the economy starts to recover, sales of inventories can outpace production, which results in low inventory–sales ratios. Companies then need to accumulate more inventories to restore the ratio to normal level. C is incorrect because, in the early stages of a recovery, inventories are likely to fall as sales increase faster than production.

Solution to 3:

B is correct. The companies are slow to increase production in early recovery phase because they first want to confirm the recession is over. Increasing output also takes time after the downsizing during the recession.

2.2.3 *Consumer Behavior*

Households represent the largest single sector of almost every developed economy (for example, it is 70% of the US economy). As a result, patterns of household consumption determine overall economic direction more than any other sector. Patterns

of household consumption are important to practitioners for a variety of reasons. For example, equity analysts covering consumer product companies would have a high interest in the sector.

Two primary measures of household consumption are retail sales and a broad-based indicator of consumer spending that also includes purchases outside purely retail establishments, such as utilities, household services, and so on. Often these measures are presented in nominal terms and deflated to indicate directions of real or unit purchases and growth. Some additional measures make finer distinctions, such as tracking spending, both real and nominal, of a specific group(s) of consumer products. The three major divisions are (1) durable goods, such as autos, appliances, and furniture; (2) non-durable goods, such as food, medicine, cosmetics, and clothing; and (3) services, such as medical treatment, entertainment, communications, and personal services. Because durable purchases usually replace items with longer useful lives, during economic downturns households can postpone such purchases more readily than spending on either services or non-durable goods. Comparing trends in durable purchases with those in the other categories can give practitioners a notion of the economy's progress through the cycle; a weakness in durables spending may be an early indication of general economic weakness, and an increase in such spending may signal a more general cyclical recovery.

Beyond direct observations of consumer spending and its mix, practitioners can also gauge future directions by analyzing measures of consumer confidence or sentiment to ascertain how aggressive consumers may be in their spending. Usually, such information is in the form of surveys intended to provide practitioners with a general guide to trends. But in practice, they frequently do not reflect actual consumer behavior because survey respondents may answer what they imagine are the preferences of the typical consumer, indicating behavior contrary to their own.

Growth in income is typically a better indicator of consumption prospects, and household income figures are widely available in most countries. Especially relevant is after-tax income or what is frequently called disposable income. Some analysts chart consumer spending based on a concept termed permanent income. Permanent income excludes temporary income and unsustainable losses and gains and tries to capture the income flow on which households believe they can rely. The basic level of consumption reflects this notion of permanent income. However, spending on durables tends to rise and fall with disposable income, regardless of the source, not just permanent income.

But consumer spending patterns frequently diverge from trends in income, no matter how income is measured. An analysis of the saving rates can assist practitioners in this regard. Cross-border comparisons of saving rates are difficult because saving rates are calculated in different ways in different countries and sometimes in different ways within the same country. But because all measures of saving rates aim in one way or another to measure the percentage of income households set aside from spending, changes in saving rates can capture consumers' intent to reduce spending out of current income. The saving rate may also reflect future income uncertainties perceived by consumers (precautionary savings). Therefore, a higher saving rate may indicate consumers' ability to spend despite possible lower income in the future. A rise in the saving rate, usually measured as a percentage of income, may indicate caution among households and signal economic weakening. At the same time, the greater the stock of savings in the household sector and the wider the gap between ongoing income and spending, the greater the capacity for households to increase their spending. So, although unusually high savings may at first say something negative about the cyclical outlook, they point longer-term to the potential for recovery.

EXAMPLE 4

Consumer Behavior

1 Durable goods have the most pronounced cyclical behavior because:
   - **A** they have a longer useful life.
   - **B** their purchase cannot be delayed.
   - **C** they are needed more than non-durable goods or services.

2 Permanent income provides a better guide to:
   - **A** saving rates.
   - **B** spending on services.
   - **C** spending on durable goods.

Solution to 1:

A is correct. Durable goods are usually big ticket items, the life span of which can be extended with repairs and without incurring the high replacement costs. So, consumers tend to delay replacement when economic outlook is not favorable.

Solution to 2:

B is correct. Households adjust consumption of discretionary goods and services based on the perceived permanent income level rather than temporary earning fluctuations. Saving rates and durable goods consumption are more related to the short-term uncertainties caused by recessions.

2.3 Housing Sector Behavior

Although generally a much smaller part of the overall economy than consumer spending, housing activity experiences dramatic swings that it often counts more in overall economic movements than the sector's relatively small size might suggest. Almost every major economy offers statistics on new and existing home sales, residential construction activity, and sometimes, importantly, the inventory of unsold homes on the market. Statistics are also potentially available for the average or median price of homes, sometimes recorded by type of housing unit and sometimes as the price per square foot or square meter. Whatever the specific statistics, the relationships in this area typically follow fairly regular cyclical patterns.

Because many home buyers finance their purchase with a mortgage, the sector is especially sensitive to interest rates. Home buying and consequently construction activity expand in response to lower mortgage rates and contract in response to higher mortgage rates.

Beyond such interest rate effects, housing also follows its own internal cycle. When housing prices are low relative to average incomes, and especially when mortgage rates are also low, the cost of owning a house falls and demand for housing increases. Often indicators of the cost of owning a house are available to compare household incomes with the cost of supporting an average house, both its price and the expense of a typical mortgage. Commonly, housing prices and mortgage rates rise disproportionately as expansionary cycles mature, bringing on an increase in relative housing costs, even as household incomes rise. The resulting slowdown of house sales can lead to a cyclical downturn first in buying and then, as the inventory of unsold houses builds, in actual construction activity.

These links, clear as they are, are far from mechanical. If housing prices have risen rapidly in the recent past, for instance, many people will buy to gain exposure to the expected price gains, even as the purchase in other respects becomes harder

to rationalize. Such behavior can extend the cycle upward and may result in a more severe correction. This result occurs because "late buying" activity invites overbuilding. The large inventory of unsold homes eventually puts downward pressure on real estate prices, catching late buyers, who have stretched their resources. This pattern occurred in many countries during the 2008–2009 global financial crisis.

Cyclical behavior in housing occurs around the long run growth trend in housing determined by demographics, such as family and household formation. Not every economy has data on family formation, but almost all offer information on the growth of specific age groups or cohorts in their respective populations. A focus on those cohorts, typically 25- to 40-year-olds, when household formation commonly occurs, usually can substitute for direct measures of net family formation. Adjusted for older people who are vacating existing homes, such calculations serve as an indicator of underlying, longer-term, secular housing demand. Although such measures have little to do with business cycles, they do offer a gauge, along with affordability, of how quickly the housing market can correct excess and return to growth. In China, for instance, where the government estimated a need for about 400 million more urban housing units over the following 25 years, housing demand may quickly reverse cyclical weakness more so than in such economies as Italy or Japan where net new family formation is relatively slight.

EXAMPLE 5

Housing Sector Behavior

1 Housing is more sensitive than other sectors of the economy to:
   - **A** interest rates.
   - **B** permanent income.
   - **C** government spending.

2 Apart from questions of affordability, house buying is *most likely* affected by:
   - **A** the rate of family formation.
   - **B** expectation of housing price increases.
   - **C** both the rate of family formation and expectation of housing price increases.

Solution to 1:

A is correct. Because real estate purchases are usually financed with mortgage loans, interest rate changes directly influence the monthly payment amounts.

Solution to 2:

C is correct. Family formation constitutes the actual need for housing, whereas buying on the expectation of housing price increases reflects the fact that real estate has investment value.

2.4 External Trade Sector Behavior

The external trade sector varies tremendously in size and importance from one economy to another. In such places as Singapore, where almost all inputs are imported and the bulk of the economy's output finds its way to the export market, trade (the sum of both exports and imports) easily exceeds its GDP. In other places, such as the United States, external trade assumes a much smaller part of GDP. Since the 1970s,

the relative size of external trade has grown in almost every country in the world. With the rise in external trade, the business cycles of the large economies in the world can be more easily transmitted to other economies.

Typically, imports rise, all else equal, with the pace of domestic GDP growth, as needs and wants or generally rising demand also increase purchases of goods and services from abroad. Thus, imports respond to the domestic cycle. Exports are more dependent on cycles in the rest of the world. If these external cycles are strong, all else equal, exports will grow even if the domestic economy should experience a decline in growth. To understand the impact of exports, financial analysts need to understand the strength of the major trading partners of the economy under consideration. Most practitioners look at the net difference between exports and imports (they use the balance of payments, which calculates trade's contribution to the economy as exports less imports). The net effect of trade may offset cyclical weakness and, depending on the importance of exports to the economy, could erase it altogether. For these reasons, such differences can mean the pattern of external trade balances is entirely different from the rest of the domestic economic cycle.

Currency also has an independent effect that can move trade in directions strikingly different from the domestic economic cycle. When a nation's currency appreciates (the currency gains in strength relative to other currencies), foreign goods seem cheaper than domestic goods to the domestic population, prompting, all else equal, a relative rise in imports. At the same time, such currency appreciation makes that nation's exports more expensive in global markets and may reduce exports. Of course, currency depreciation has the opposite effect. Although currency moves may be volatile and on occasion extreme, they only have a significant effect on trade and the balance of payments when they cumulate in a single direction for some time. Moves from one month or quarter to the next, however great, have a minimal effect until they persist. Thus, cumulative currency movements that take place over a period of years will have an impact on trade flows that will persist even if the currency subsequently moves in the opposite direction for a temporary period.

Financial analysts need to consider a wide range of variables, both in the domestic economy and abroad, to assess relative GDP growth rates and then factor in currency considerations to ascertain whether they reinforce other cyclical forces or counteract them. Generally, GDP growth differentials in global economic growth rates between countries have the most immediate and straightforward effects; domestic changes in economic activity raise or reduce imports and foreign economic activity changes raise or reduce exports. Currency moves have a more complex and, despite the interim short-term currency moves, a more gradual effect.

EXAMPLE 6

External Trade

1 Imports generally respond to:

- **A** the level of exports.
- **B** domestic industrial policy.
- **C** domestic GDP growth rate.

2 Exports generally respond to the:

- **A** level of unionization.
- **B** global GDP growth rates.
- **C** domestic GDP growth rates.

Solution to 1:

C is correct. As a part of aggregate demand, imports reflect the domestic needs for foreign goods, which vary together with domestic economic growth.

Solution to 2:

B is correct. Exports reflect the foreign demands on domestic output, which depend on the conditions of global economy.

THEORIES OF THE BUSINESS CYCLE

3

Business cycles have been recognized since the early days of economic theory, and considerable effort has gone into identifying different cycles and explaining them. Until the 1930s, however, the general view was that they were a natural feature of the economy and the pain of recessions is temporary. But the depth and severity of the 1930s downturn (known as the Great Depression) created a crisis in economic theory.

After the Great Depression (which began in 1929), the debate between various economic schools of thought (Neoclassical, Austrian, and Keynesian) spurred changes in the way the business cycle was described and explained. Similarly, after the recessions triggered by the oil shocks of 1973 and 1979, the old paradigm was taken apart and new developments in economics and quantitative methods led to an improved understanding of short-term economic dynamics. In this section, we will review and summarize some of the main theories.

3.1 Neoclassical and Austrian Schools

Neoclassical analysis relies on the concept of general equilibrium—that is, all markets will reach equilibrium because of the "invisible hand, or free market," and the price will be found for every good at which supply equals demand. All resources are used efficiently based on the principle of marginal cost equaling marginal revenue, and no involuntary unemployment of labor or capital takes place. In theory, if a shock of any origin shifts either the aggregate demand or aggregate supply curve, the economy will quickly readjust and reach its equilibrium via lower interest rates and lower wages. In practice, because the neoclassical school provides that the invisible hand will reallocate capital and labor so that they will be used to produce whatever consumers want, it does not allow for "fluctuations found in the aggregate economic activity."

Neoclassical economists rely on **Say's law**: All that is produced will be sold because supply creates its own demand. French economist J.B. Say pointed out that if something is produced, the capital and labor used for that production will have to be compensated. This compensation of the factors (interest for capital and wages for labor) creates purchasing power in the sense that the workers receive a paycheck and thus can buy goods and services they need. Widespread declines in demand would be strictly temporary.

The Neoclassical school does not have a theory of the business cycle, and the closest it gets to it is Schumpeter's creative destruction theory, which shows cycles within industries as a result of technological progress but no economy-wide fluctuations.[2] Schumpeter formulated a theory of innovations, which explained cycles limited

2 Joseph Alois Schumpeter was born in Austria and studied with members of the Austrian school, such as Menger and Hayek, but he was more Neoclassical than Austrian in the economic sense. He taught in the United States for many years.

to individual industries: When an inventor comes up with a new product (e.g., the digital music player in recent decades) or a new, better way to produce an existing good or service (e.g., radio frequency identification tracking of inventories), then the entrepreneur that introduces the new discovery will likely have bigger profits and may drive the existing producers out of business. Therefore, innovations can generate crises that affect only the industry affected by the new invention. Neoclassical economics recognizes that business cycles exist but treats them as temporary disequilibria.

In the neoclassical school, a massive crisis, such as the Great Depression of the 1930s with widespread unemployment of more than 20% throughout the industrialized world, is impossible. Yet, it happened. The crisis started in the United States and successively affected many other countries. The 1929 crisis touched many sectors at the same time and in a dramatic fashion. Because the neoclassical theory denied the possibility of a prolonged depression, it could not be used to explain how to fight such a depression. The main adjustment mechanism proposed by the neoclassical school—cuts in wages—was difficult to achieve and, as we shall see, was questioned by the Keynesian school.

The Austrian school, including F. von Hayek and L. von Mises, shared some views of the neoclassical school, but focused more on two topics that were largely unimportant in the neoclassical framework: the roles of money and government. Money was not necessary in the neoclassical model, because the exchange of goods and services could occur in the form of barter and still reach general equilibrium. Money was seen just as a way to simplify exchange. Similarly, the role of government in the neoclassical model was quite limited because the economy could take care of itself and little else was needed of the government besides upholding the law and securing the borders.

The Austrian School focuses on the role of low interest rates and the resulting excessive credit growth. During a boom, this expansion results in over-investment in projects with low returns. When interest rates rise as the boom continues, these investments fail and cause the economy to move into recession. Low interest rates early in the boom may be the result of active central bank policies to stimulate the economy. Once companies realize that they have accumulated too much equipment and too many structures, they will suddenly stop investing, which depresses aggregate demand (aggregate demand shifts left dramatically) and causes a crisis throughout the economy. To reach the new equilibrium, all prices including wages must decrease.

The Austrian School sees business cycles as arising from these cycles of over-investment and failures. Therefore, Austrian economists advocate limited government (or central bank) intervention in the economy, lest the government cause a boom-and-bust cycle. The best thing to do in the recession phase is to allow the necessary market adjustment to take place as quickly as possible.

3.2 Keynesian and Monetarist Schools

The Keynesian and Monetarist schools of economic thought have been among the most influential. Their prescriptions concerning the business cycle are discussed in the following sections.

3.2.1 *Keynesian School*

As previously mentioned, if a recession occurs, the Neoclassical and Austrian schools argue in general that no government intervention is needed. Unemployment and excess supply of goods will be solved by allowing market prices to decrease (including wages) until all markets clear: Supply equals demand and factors of production are fully employed.

British economist John Maynard Keynes[3] disagreed with both Neoclassical and Austrian views. He observed that a generalized price and wage reduction (solely brought about through market forces), necessary to bring markets back to equilibrium during a recession, would be hard to attain. For example, workers may not want to see their nominal compensation decrease because nobody likes a pay cut.

But Keynes thought that even if workers agreed to accept lower salaries, this situation might exacerbate the crisis by reducing aggregate demand rather than solving it because lower wage expectations would shift aggregate demand left. For example, if wages fell, workers would need to cut back on their spending. This response would cause a further contraction in the demand for all sorts of goods and services, starting from the more expensive items, such as durable goods, and move in a "domino effect" through the economy (the downward spiral of the aggregate demand curve continuously shifting left, as mentioned earlier).

Furthermore, Keynes believed there could be circumstances in which lower interest rates would not reignite growth because business confidence or "animal spirit" was too low. Therefore, Keynes advocated government intervention in the form of fiscal policy. While he accepted the possibility that markets would reach the equilibrium envisioned by Neoclassical and Austrian economists over the long run, he famously quipped that "in the long run, we are all dead;" that is, the human suffering is excessive while waiting for all shocks to be absorbed and for the economy to return to equilibrium.

When crises occur, the government should intervene to keep capital and labor employed by deliberately running a larger fiscal deficit. This intervention would limit the damages of major recessions. Although this concept continues to be a highly politically charged debate, many economists agree that government expenditure can limit the negative effect of major economic crises in the short term. The practical criticisms that are often expressed about Keynesian fiscal policy are:

1. Fiscal deficits mean higher government debt that needs to be serviced and repaid eventually. There is a danger that government finances could move out of control.
2. Keynesian cyclical policies are focused on the short term. In the long run, the economy may come back and the presence of the expansionary policy may cause it to "overheat"—that is, to have unsustainably fast economic growth, which causes inflation and other problems. This result is because of the typical lags involved in expansionary policy taking effect on the economy.
3. Fiscal policy takes time to implement. Quite often, by the time stimulatory fiscal policy kicks in, the economy is already recovering. (Monetary policy determines the available quantities of money and loans in an economy.)

Keynes' writings did not advocate a continuous presence of the government in the economy, nor did he suggest using economic policy to "fine tune" the business cycle. He only advocated decisive action in case of a serious economic crisis, such as the Great Depression.

The Perspective of Hyman Minsky

A different view of business cycles came from Hyman Minsky. His view had something in common with the Austrian school and something in common with Keynes. Minsky believed that excesses in financial markets exacerbate economic fluctuations. For example,

3 John Maynard Keynes' name is often mentioned in full, with first and middle name, to avoid confusion with his father, John Neville Keynes, who was also an economist.

a rapid growth of credit, often given to risky ventures in the late expansion phase of the cycle, will be followed by a "credit crunch" during the down-swing phase. Minsky traced excesses to a type of complacency in which people underestimate the risk of events that have not occurred in a while. Therefore, if the economy has been in a long expansion, people may think that the market works very well and that the expansion will last forever—that is, extrapolating past experiences. In this sense, Minsky could be seen as a precursor of behavioral finance, which is the branch of finance that studies how cognition biases, such as overconfidence and short memory, induce investors to be overconfident and make suboptimal choices.

The term **Minsky moment** has been coined for a point in business cycle when, after individuals become overextended in borrowing to finance speculative investments, people start realizing that something is likely to go wrong and a panic ensues leading to asset sell-offs. The subprime crisis that affected many industrialized countries starting in 2008 has been represented as a "Minsky moment"[4] because it came after years in which risk premiums (e.g., the differentials, or spreads, between very risky bonds and very safe bonds) were at historically low levels. Typically, low risk premiums suggest that no adverse events are expected—in other words, investors believe that because the economy and the markets have been enjoying a protracted expansion, there is no reason to worry about the future. As a consequence, many market observers suggest that business cycles are being tamed. This kind of view of the world leads people to underestimate risk, for example, by not doing the appropriate diligent research before granting a loan or before purchasing a security—in a word, complacency.

The "Minsky moment" has been compared with a cartoon in which a cartoon character walks over a cliff without realizing that it is doing so. When he looks down and sees that he is walking on thin air, he panics and falls to the bottom of the canyon—just like the world economy in 2008.

3.2.2 *Monetarist School*

The Monetarist school, generally identified with Milton Friedman, objected to Keynesian intervention for four main reasons:

1. The Keynesian model does not recognize the supreme importance of the money supply. If the money supply grows too fast, there will be an unsustainable boom, and if it grows too slowly, there will be a recession. Friedman focused mainly on broad measures of money, such as M2.
2. The Keynesian model lacks a complete representation of utility-maximizing agents and is thus not logically sound.
3. Keynes' short-term view failed to consider the long-term costs of government intervention (e.g., growing government debt and high cost of interest on this debt).
4. The timing of governments' economic policy responses was uncertain, and the stimulative effects of a fiscal expansion may take effect after the crisis was over, and thus cause more harm than good.[5]

Therefore, Monetarists advocate a focus on maintaining steady growth of the money supply, and otherwise a very limited role for government in the economy. Fiscal and monetary policy should be clear and consistent over time, so all economic agents can

4 Paul McCulley (for example, see McCulley 2009) originated this expression.

5 Markets may react differently to changes in interest rates and other tools of monetary policy. There is a long chain of events from the time when interest rates are cut, to when banks change the rates they charge clients, to when a company sees that rates are lower and thus decides to invest in new equipment, to when the equipment is finally purchased. Therefore, by the time these events all happen, the economy may be in expansion and the new investment may lead the economy to overheating.

forecast government actions. In this way, the uncertainty of economic fluctuations would not be increased by any uncertainty about the timing and magnitude of economic policies and their lagged effects.

According to the Monetarist school, business cycles may occur both because of exogenous shocks and because of government intervention. It is better to let aggregate demand and supply find their own equilibrium than to risk causing further economic fluctuations. However, a key part of monetarist thought is that the money supply needs to continue to grow at a moderate rate. If it falls, as occurred in the 1930s, the economic downturn could be severe, whereas if money grows too fast, inflation will follow.

3.3 The New Classical School

Starting in the 1970s, economists such as Robert Lucas started questioning the foundations of the models used to explain business cycles. Among other things, Lucas agreed with Friedman (1968) and pointed out that the macroeconomic models should try to represent the actions of economic agents with a utility function and a budget constraint, just like the models used in microeconomics. This approach has come to be known as **new classical macroeconomics**—an approach to macroeconomics that seeks the macroeconomic conclusions of individuals maximizing utility on the basis of rational expectations and companies maximizing profits. The assumption is made that all agents are roughly alike, and thus solving the problem of one agent is the same as solving that of millions of similar agents (or the per capita income and consumption of the average agent).

The New Classical models are dynamic in the sense of describing fluctuations over many periods and present general equilibrium in the sense of determining all prices rather than one price. The models by Edward C. Prescott and Finn E. Kydland, who are among the pioneers of this approach, have an economic agent that has to face external shocks (e.g., as a result of changes in technology, tastes, or world prices) and thus optimizes its choices to reach the highest utility. If all agents act in similar fashion, the markets will gradually adjust toward equilibrium.

3.3.1 *Models without Money: Real Business Cycle Theory*

New Classical economists comment that some policy recommendations made in the past were rather illogical: for example, if everybody knows that in a recession the government will give out low rate loans to corporations that want to invest in new equipment and structures, why would any reasonable company invest outside recessions unless absolutely required to? Obviously, if most companies thought that, they would stop investing, thus causing a recession that otherwise would not have occurred. Essentially, the government's anti-cyclical policy could cause a recession.

Because, just like the neoclassical models, the initial New Classical models did not include money, they were called real business cycle models (often abbreviated as RBC). Cycles have real causes, such as changes in technology, whereas monetary variables, such as inflation, are assumed to have no effect on GDP and unemployment.[6]

RBC models of the business cycle conclude that expansions and contractions represent efficient operation of the economy in response to external real shocks. Because the level of economic activity at any time is consistent with maximizing expected utility, the policy recommendation of RBC theory is for government *not* to intervene in the economy with discretionary fiscal and monetary policy.

6 See Plosser (1989) and Romer (2011) for an introduction to RBC models. Basically, RBC models assume that economic agents are fully rational and that markets function with no imperfection or friction. As a consequence, any changes in monetary aggregates or other monetary policies will promptly cause changes in price levels and other variables without affecting real GDP or employment.

Critics of RBC models often focus on the labor market. Because RBC models rely on efficient markets, it follows that unemployment can only be short term: apart from frictional unemployment,[7] if markets are efficient, a person who does not have a job can only be a person who does not want to work. If a person is unemployed, in the context of efficient markets, he just needs to lower his wage rate until he finds an employer who hires him. This assumption is logical because if markets are perfectly flexible, all markets must find equilibrium and full employment.

Therefore, as suggested particularly by the earliest RBC models, a person is unemployed because he or she is asking for wages that are too high, or in other words, this person's utility function is maximized by having more leisure (e.g., free time to visit museums, watch games on TV, and enjoy time with friends) and less consumption (which could be increased by giving up some leisure and finding a job). However, the observation that during a recession many people are eagerly searching for jobs and are unable to find employment despite dropping their asking wages substantially suggests that this theory is unrealistic.

Although many find this explanation unconvincing, RBC theorists argue that, undeniably, markets would clear if people were rational and avoided unrealistic expectations of earnings or simply enjoyed their leisure accompanied by optimally meager consumption.

An interesting feature of RBC models is that they give aggregate supply a more prominent role than many other theories. For example, supply has a limited importance in the Keynesian theory, probably because Keynes was more concerned with the Great Depression, which was largely a crisis of aggregate demand. RBC models show that supply shocks, such as advances in technology or changes in the relative prices of inputs, cause the aggregate supply (AS) to shift left. A new technology can change potential GDP, for example, thus moving long-run AS to the right. Adjustment will be needed because not all companies can adopt the new technology at once, and therefore short-run AS will not jump to the new equilibrium immediately. Similarly, an increase of energy prices shifts short-run AS to the left (higher prices and lower GDP). In the long run companies and households can learn to use less of the expensive energy inputs (substitution effect), and therefore long-run AS will shift right (higher GDP) if the economy learns to produce more goods with less energy.

3.3.2 *Models with Money*

Inflation is often seen as a cause of business cycles, because when monetary policy ends up being too expansionary, the economy grows at an unsustainable pace—creating an inflationary gap. The result is that, for example, suppliers cannot keep up with demand. In this environment, prices will tend to grow faster than normal—that is, inflation.

In response to inflationary pressure, the central bank will often intervene to limit inflation by "tightening" monetary policy, which generally means increasing interest rates, so that the cost of borrowing will be higher and demand for goods and services will slow down (a leftward shift in aggregate demand caused by the higher cost of money). This response will decrease equilibrium GDP and can result in a recession.

Given that inflation appears to trigger policy responses from central banks, it is an important part of modern business cycles. Therefore, it can be helpful to use models that include money to explain economic growth. As mentioned earlier, RBC models

7 Frictional unemployment arises not because of the lack of general job opportunities but from the fact that both employers and potential employees need some time to find a good match between the job vacancy and the candidate's interests, skills and location preference, and so on. The frictionally unemployed can be those people who quit their previous jobs voluntarily but have yet to find or start a new job and new entrants to the labor force, such as recent college graduates, or re-entrants, such as formerly discouraged workers who have started looking for but have yet to find a job.

assume that transactions could occur with barter, and thus do not explicitly include money. More recent dynamic general equilibrium models (for example, Christiano, Eichenbaum, and Evans 2005) include money and inflation.

Monetary policy can be incorporated into dynamic general equilibrium models with money. In one type of model, the economy receives shocks from changes in technology and consumer preferences (like in the RBC case), but can also receive shocks from monetary policy, which sometimes can tame the business cycle and at other times may exacerbate it.

Another group of dynamic general equilibrium models are the **Neo-Keynesians** or **New Keynesians**.[8] Like the New Classical school, the Neo-Keynesian school attempts to place macroeconomics on sound microeconomic foundations. In contrast to the New Classical school the Neo-Keynesian school assumes slow-to-adjust ("sticky") prices and wages. The Neo-Keynesian models show that markets do not reach equilibrium immediately and seamlessly, but even small imperfections may cause markets to be in disequilibrium for a long time. As a consequence, government intervention as advocated in the 1930s by Keynes may be useful to eliminate unemployment and bring markets toward equilibrium.

The typical example of these imperfections, which also appeared in Keynes' work, is that workers do not want their wages to decrease to help the market reach a new equilibrium (i.e., wages are often downwardly sticky).[9] Another possibility that some economists suggested in the 1980s is called the "menu costs" explanation: It is costly for companies to continuously adjust prices to make markets clear, just like it would be costly for a restaurant to print new menus daily with updated prices.[10] Another explanation is that every time an economic shock hits a company, the company will need some time to reorganize its production.

EXAMPLE 7

Real Business Cycle Models

1 The main difference between New Classical (RBC) and Neo-Keynesian models is that the New Classical models:

- **A** are monetarist.
- **B** use utility-maximizing agents, whereas Neo-Keynesian does not.
- **C** assume that prices adjust quickly to changes in supply and demand, whereas Neo-Keynesians assume that prices adjust slowly.

2 Basic RBC models focus on the choices of a typical individual, who can choose between consuming more (thus giving up leisure) and enjoying leisure more (thus giving up consumption). What causes persistent unemployment in this model?

- **A** Contractionary monetary policy causes a shock to real variables.

8 For an introduction to Neo-Keynesian models, see Romer (2011) and Mankiw (1989).

9 As mentioned earlier, Keynes thought that even if workers agreed to accept lower wages, this might exacerbate the crisis rather than solving it because lower wage expectations would shift AD left.

10 Clearly, both this example and the "menu costs" name were initially envisioned before personal computers and laser printers became affordable and widely used. Still, one can imagine the cost for a store owner to replace the price tags on every item in the store on a daily basis, and also how this would confuse shoppers.

B The economy returns to equilibrium promptly, thus persistent unemployment does not exist.

C The utility function: If the individual prefers leisure much more than consumption, she will forego consumption and instead choose unemployment to enjoy more leisure when the market salary is low.

Solution to 1:

C is correct. A key feature of Neo-Keynesian macroeconomics is the stickiness of prices. In contrast, New Classical views assume flexible price adjustments that ensure market clearing.

Solution to 2:

C is correct. Shocks in the standard New Classical model can only have a temporary effect, thus A is not the right answer. Unemployment can still exist when the labor market is cleared, so a rational explanation is provided in C.

In recent years, a consensus concerning business cycles has gradually started building in macroeconomics. It is too early to say that economists agree on all causes of and remedies for business fluctuations, but at least an analytical framework has emerged, which encompasses both New Classical and Neo-Keynesian approaches. Woodford (2009), among others, shows that new research seems to be leading to a unified approach.

The debate about business cycles often receives a politically partisan treatment in the press because some people are generally against government intervention in the economy (for example, because it may lead to large deficits) and others are in favor (for example, because it may alleviate the effects of a large economic shock). It is important to base investment decisions on analysis and not on politics; the financial analyst must try as much as possible to set personal biases aside.

However, there is little doubt that central banks try to manage the business cycle by raising interest rates when the economy is growing rapidly and inflation accelerates and cutting rates when the economy is weak. In the 2008–2009 downturn, when official interest rates approached zero, central bankers extended their actions to include "quantitative easing" to try to lower interest rates further out on the yield curve to stimulate the economy.

EXAMPLE 8

Analyzing Government Expenditure

Simple criteria for the financial analyst wondering whether a government's expenditure is excessive (i.e., unsustainably high and/or of an inappropriate composition) include the following:[11]

1 Does the government always have a deficit no matter the cyclical phase, or does it have surpluses during economic booms?

11 For a more formal and data-rich approach, see Reinhart and Rogoff (2009).

2 Does the government have a deficit because of a defined series of necessary investments that will improve the productivity of the country, or is it spending much of its money on questionable uses?

3 Is the growth rate of debt (government budget deficit as a percentage of GDP) higher than GDP growth? If so, the debt level will not likely be sustainable.

When government expenditures are excessive, inflation often follows. After that, a recession may occur because the central bank takes necessary measures to slow down an overheated economy. That is, if government purchases increase aggregate demand too much, thus causing inflation (expansionary fiscal policy), the central bank will intervene to stop prices from increasing too quickly (tightening or contractionary monetary policy).

UNEMPLOYMENT AND INFLATION

4

Many governments and central banks have economic policy objectives related to limiting the rate at which citizens are unemployed and containing price inflation (i.e., preserving the purchasing power of a domestic currency). The relationships of these variables to the business cycle are discussed in the following sections. In general, unemployment is at its highest just as the recovery starts and is at its lowest at the peak of the economy.

4.1 Unemployment

A typical cause of business cycle downturns is a tight labor market—that is, one with low unemployment. An overheated economy leads to inflation when unemployment is very low. Workers ask for higher wages because they expect prices of goods and services to keep going up, and at the same time they have market power against employers because there are few available workers to be hired. This upward pressure on wages coupled with the impact of wage escalator clauses (automatic increases in wages as the consumer price index grows) triggers a price–wage inflationary spiral. This issue was a particular problem in industrialized countries during the 1960s and 1970s and remains an issue today.

A key aspect in this process is inflation expectations. Because inflation expectations are high, the request for higher wages is stronger, which induces employers to increase prices in advance to keep their profit margins stable. This avalanche process grows with time. Central banks act, sometimes drastically, to slow down the economy and reset inflationary expectations throughout the economy at a low level, so that if everyone expects low inflation, the inflationary spiral itself will stop. These actions may trigger a deep recession. Therefore, whenever a financial analyst sees signs of a price–wage spiral in the making, a reasonable response would be to consider the effect of both high inflation and sharp tightening of monetary policy.

This example shows that measures of labor market conditions are important in assessing whether an economy is at risk of cyclical downturn.

The following are the definitions of a few terms that are used to summarize the state of the labor market:

- **Employed**: The number of people with a job. This figure normally does not include people working in the informal sector (e.g., unlicensed cab drivers, illegal workers, etc.).

- **Labor force**: The number of people who either have a job or are actively looking for a job. This number excludes retirees, children, stay-at-home parents, full-time students, and other categories of people who are neither employed nor actively seeking employment.
- **Unemployed**: People who are actively seeking employment but are currently without a job. Some special subcategories include:
  - **Long-term unemployed**: People who have been out of work for a long time (more than three to four months in many countries) but are still looking for a job.
  - **Frictionally unemployed**: People who are not working at the time of filling out the statistical survey because they are taking time to search for a job that matches their skills, interests, and other preferences better than what is currently available, or people who have left one job and are about to start another job. The frictionally unemployed includes people who have voluntarily left their previous positions to change their jobs, in other words, they are "between jobs," and those new entrants or re-entrants into the labor force who have not yet found work. Frictional unemployment is short-term and transitory in nature
- **Unemployment rate**: The ratio of unemployed to labor force.
- **Activity ratio** (or participation ratio): The ratio of labor force to total population of working age (i.e., those between 16 and 64 years of age).
- **Underemployed**: A person who has a job but has the qualifications to work at a significantly higher-paying job. For example, a lawyer who is out of work and takes a job in a bookstore could call herself underemployed. This lawyer would count as employed for the computation of the unemployment rate (she does have a job, even if it may not be her highest paying job). Although the unemployment rate statistic is criticized for not taking the issue of underemployment into account, it may be difficult to classify whether a person is truly underemployed—for example, the lawyer may find legal work too stressful and prefers working at the bookstore. However, data for part-time working is sometimes a good proxy.
- **Discouraged worker**: A person who has stopped looking for a job. Perhaps because of a weak economy, the discouraged worker has given up seeking employment. Discouraged workers are statistically outside the labor force (similar to children and retirees), which means they are not counted in the official unemployment rate. During prolonged recessions, the unemployment rate may actually decrease because many discouraged workers stop seeking work. It is important to observe the participation rate together with the unemployment rate to understand if unemployment is decreasing because of an improved economy or because of an increase in discouraged workers. Discouraged workers and underemployed people may be considered examples of "hidden unemployment."
- **Voluntarily unemployed**: person voluntarily outside the labor force, such as a jobless worker refusing an available vacancy for which the wage is lower than their threshold or those who retired early.

4.1.1 *The Unemployment Rate*

The unemployment rate is certainly the most quoted measure of unemployment; it attempts to measure those people who have no work but would work if they could find it, generally stated as a percentage of the overall labor force. In the United States, the indicator emerges from a monthly survey of households by the US Bureau of

Labor Statistics, which asks how many household members have jobs and how many of working age do not have jobs but are seeking work. Other statistical bureaus rely on other sources for the calculation, using claims for unemployment assistance, for instance, or their equivalent. Some statistical bureaus measure the labor force simply as those of working age, regardless of whether they are ready or willing to work. These differences can make precise international comparisons problematic. One solution is to use the International Labour Organization (ILO) statistics that try to estimate on a consistent basis. As indicated earlier, some statistical agencies add perspective with other measures; for example, what proportion of those who have ceased work are discouraged, underemployed, or have opted out of the labor force for other reasons or are working part-time.

Although these various unemployment measures provide insight to the state of the economy, they are inaccurate in pointing to cyclical directions for two primary reasons, both of which make unemployment a lagging economic indicator of the business cycle.

One reason is that the unemployment rate tends to point to a past economic condition—that is, it lags the cycle—because the labor force expands and declines in response to the economic environment. Compounding the inaccuracy, when times get hard, discouraged workers cease searching for work, reducing the number typically counted as unemployed and making the jobs market look stronger than it really is. Conversely, when the jobs market picks up, these people return to the search, and because they seldom find work immediately, they at least initially raise the calculation of those unemployed, giving the false impression of the lack of recovery in the jobs market, when, in fact, it is the improvement that brought these people back into the labor force in the first place. Sometimes this cyclical flow of new jobs seekers is so great that the unemployment rate actually rises even as the economic recovery gains momentum. Those agencies that measure the labor force in terms of the working-age population avoid this bias, because this measure (working-age population) is unaffected by economic conditions in the labor market. But this approach introduces biases of its own, such as counting as unemployed those people who have severe disabilities and could never seek work.

The second reason the unemployment indicator tends to lag the cycle comes from the typical reluctance of businesses to lay off people. The reluctance may stem from a desire to retain good workers for the long run, or just reflect constraints written into labor contracts that make layoffs expensive. The reluctance makes the various measures of unemployment rise more slowly as the economy slides into recession than they otherwise might. Then as the recovery develops, a business waits to hire until it has fully employed the workers it has kept on the payroll during the recession; this delay causes decreases in the unemployment rate to lag in the cyclical recovery, sometimes for a long time.

4.1.2 *Overall Payroll Employment and Productivity Indicators*

To get a better picture of the employment cycle, practitioners often rely on more straightforward measures of payroll growth. By measuring the size of payrolls, practitioners sidestep such issues as the ebb and flow of discouraged workers. These statistics, however, do have biases of their own. It is hard, for instance, to count employment in smaller businesses, which may be significant drivers of employment growth. Still, there is a clear indication of economic trouble when payrolls shrink and a clear indication of recovery when they rise.

The examination of other measures can also assist in understanding the employment situation and its use in determining cyclical directions. Two additional measures are hours worked, especially overtime, and the use of temporary workers. A business does not want to make mistakes with full-time staff, either hiring or firing. Thus, at the first signs of economic weakness, managers cut back hours, especially overtime. Such movements can simply reflect minor month-to-month production shifts, but

if followed by cutbacks in part-time and temporary staff, the picture gives a strong signal of economic weakness, especially if confirmed by other independent indicators. Similarly, on the cyclical upswing, a business turns first to increases in overtime and hours. If a business then increases temporary staffing, it gives a good signal of economic recovery long before any movement in rehiring fulltime staff again, especially if confirmed by independent cyclical indicators.

Productivity measures also offer insight into this cyclical process. Because productivity is usually measured by dividing output by hours worked, a business's tendency to keep workers on the payroll even as output falls usually prompts a reduction in measured productivity. If measures are available promptly enough, this sign of cyclical weakness might precede even the change in hours. This drop in productivity precedes any change in full-time payrolls. Productivity also responds promptly when business conditions improve and the business first begins to utilize its underemployed workers, which occurs earlier than any upturn in full-time payrolls.

On a more fundamental level, productivity can also pick up in response to technological breakthroughs or improved training techniques. As already mentioned, such changes affect potential GDP. If strong enough, they can negatively affect employment trends, keeping them slower than they would be otherwise by relieving the need for additional staff to increase production. But these influences usually unfold over decades and mean little to cyclical considerations, which, at most, unfold over years. What is more, there are few statistical indicators to gauge the onset of technological change, confining analysts to the use of anecdotal evidence or occasional longitudinal studies.

EXAMPLE 9

Analyzing Unemployment

1 At the peak of the business cycle, if the unemployment rate is low, the majority of the unemployed are *most likely*:
   - **A** discouraged workers.
   - **B** long-term unemployed.
   - **C** frictionally unemployed.

2 As an economy starts to recover from a trough in the business cycle, the unemployment rate is *most likely* to:
   - **A** continue to rise with a decline in the number of discouraged workers.
   - **B** start to decline with an increase in the number of discouraged workers.
   - **C** continue to rise with an increase in the number of discouraged workers.

3 An analyst observes that the unemployment rate is high and rising, whereas productivity and hours worked have declined. The analyst is *most likely* to conclude that the labor market is signaling the:
   - **A** end of a recession.
   - **B** deepening of a recession.
   - **C** peak of the business cycle.

Solution to 1:

C is correct. At the peak of a business cycle, the labor market is usually tight, and people become unemployed largely because they are either "between jobs" or they have entered or reentered the labor force but have not yet found work.

Solution to 2:

A is correct. As the economy starts to recover, discouraged workers return to the labor force and start looking for jobs, which increases both the number of unemployed and the size of the labor force. The unemployment rate rises because the rise in the unemployed population is proportionately larger than the increase in the size of the labor force. B and C are incorrect because an increase in the number of discouraged workers typically occurs when the economy is contracting.

Solution to 3:

B is correct. High and rising unemployment, declining hours worked, and falling productivity are all signs of a weak economy getting weaker. When the economy first slows down, businesses cut back employees' hours. As the recession deepens, they then lay off employees, leading to a higher unemployment rate. Yet, because workforce turnover is costly for businesses, the scale of the layoff can be less than the decline in output, resulting in a decline in productivity. A is incorrect because toward the end of a recession, businesses are hesitant to increase hiring and instead use more overtime, increasing both productivity and the hours worked. C is incorrect because at the peak of a business cycle, the unemployment rate is usually low and the level of hours worked is high.

4.2 Inflation

The overall price level changes at varying rates during different phases of a business cycle. Thus, when studying business cycles, it is important to understand this phenomenon. In general, the inflation rate is pro-cyclical (that is it goes up and down *with* the cycle), but with a lag of a year or more.

Inflation refers to a sustained rise in the overall level of prices in an economy. Economists use various price indexes to measure the overall price level, also called the aggregate price level. The **inflation rate** is the percentage change in a price index—that is, the speed of overall price level movements. Investors follow the inflation rate closely, not only because it can help to infer the state of the economy but also because an unexpected change may result in a change in monetary policy, which can in turn have a large and immediate impact on asset prices. In developing countries, very high inflation rates can lead to social unrest or even shifts of political power, which constitutes political risk for investments in those economies.

Central banks, the monetary authority in most economies, monitor the domestic inflation rates closely when conducting monetary policy. Monetary policy determines interest rates and the available quantities of money and loans in an economy. A high inflation rate combined with fast economic growth and low unemployment usually indicates the economy is overheating, which may trigger some policy movements to cool it down. However, if a high inflation rate is combined with a high level of unemployment and a slowdown of the economy—an economic state known as **stagflation** (for stagnation plus inflation)—the economy will typically be left to correct itself because no short-term economic policy is thought to be effective.

4.2.1 *Deflation, Hyperinflation, and Disinflation*

There are various terms related to the levels and changes of the inflation rate.

- **Deflation**: A sustained decrease in aggregate price level, which corresponds to a negative inflation rate—that is, an inflation rate of less than 0%.

- **Hyperinflation**: An extremely fast increase in aggregate price level, which corresponds to an extremely high inflation rate—for example, 500% to 1000% per year.
- **Disinflation**: A decline in the inflation rate, such as from around 15% to 20% to 5% or 6%. Disinflation is very different from deflation because even after a period of disinflation, the inflation rate remains positive and the aggregate price level keeps rising (although at a slower speed).

Inflation means that the same amount of money can purchase less real goods or services in the future. So, the value of money or the purchasing power of money decreases in an inflationary environment. When deflation occurs, the value of money actually increases. Because most debt contracts are written in fixed monetary amounts, the liability of a borrower also rises in real terms during deflation. As the price level falls, the revenue of a typical company also falls during a recession. Facing increasing real debt, a company that is short of cash usually cuts its spending, investment, and workforce sharply. Less spending and high unemployment then further exacerbate the economic contraction. To avoid getting too close to deflation, the consensus on the preferred inflation rate is around 2% per year for developed economies. Deflation occurred in the United States during the Great Depression and briefly during the recession following the global financial crisis of 2008–2009. Since the late 1990s, Japan has experienced several episodes of deflation.

Hyperinflation usually occurs when large scale government spending is not backed by real tax revenue and the monetary authority accommodates government spending by increasing the money supply. Hyperinflation may also be caused by the shortage of supply created during or after a war, economic regime transition, or prolonged economic distress of an economy caused by political instability. During hyperinflation, people are eager to change their cash into real goods because prices are rising very fast. As a result, money changes hands at extremely high frequency. The government also has to print more money to support its increased spending. As more cash chases a limited supply of goods and services, the rate of price increases accelerates. After World War I, a famous case of hyperinflation occurred in Germany from 1923 to 1924. During the peak of this episode, prices doubled every 3.7 days. After World War II, Hungary experienced a severe hyperinflation during which prices doubled every 15.6 hours at its peak in 1946. In 1993, the inflation rate in Ukraine peaked at 10,155% per year. In January 1994, the *monthly* inflation rate peaked at 313 million percent in Yugoslavia. The most recent hyperinflation in Zimbabwe reached a peak of *monthly* inflation at 79.6 billion percent in the middle of November 2008. Because the basic cause for hyperinflation is too much money in circulation, regaining control of the money supply is the key to ending hyperinflation.

Exhibit 2 shows recent episodes of disinflation in selected countries around the world. The first episode happened during the early 1980s. Because of the two oil crises in the 1970s, many countries around the world were experiencing high levels of inflation. In Exhibit 2, the annual inflation rates in most counties around 1980 ranged between 10% and 20%. Even though this level is still far from hyperinflation, it generated social pressure against inflationary monetary policy. At the cost of a severe recession early in the 1980s, these countries brought inflation rates down to around 5% on average by 1985. In the first years of the 1990s, inflationary experience varied widely in world markets as some countries entered recessions, such as the United States and the United Kingdom, and others boomed. However, from the beginning to the end of the decade, there was a broad-based decline in inflation rates; in some countries annual inflation rates were below 2% by the end of the decade. In many countries, the decline in inflation was attributed to high productivity growth rates.

Exhibit 2 Two Episodes of Disinflation around the World Annual Inflation Rates

	First Episode					Second Episode			
Year	**1979**	**1980**	**1983**	**1984**	**1985**	**1990**	**1991**	**1998**	**1999**
Country									
Australia	9.1	10.2	10.1	3.9	6.7	7.3	3.2	0.9	1.5
Canada	9.1	10.1	5.9	4.3	4.0	4.8	5.6	1.0	1.7
Finland	7.5	11.6	8.4	7.1	5.2	6.1	4.3	1.4	1.2
France	10.6	13.6	9.5	7.7	5.8	3.2	3.2	0.6	0.5
Germany	4.0	5.4	3.3	2.4	2.1	2.7	4.0	1.0	0.6
Italy	14.8	21.1	14.6	10.8	9.2	6.5	6.3	2.0	1.7
Japan	3.7	7.8	1.9	2.3	2.0	3.1	3.3	0.7	–0.3
South Korea	18.3	28.7	3.4	2.3	2.5	8.6	9.3	7.5	0.8
Spain	15.7	15.6	12.2	11.3	8.8	6.7	5.9	1.8	2.3
Sweden	7.2	13.7	8.9	8.0	7.4	10.4	9.4	–0.3	0.5
United Kingdom	13.4	18.0	4.6	5.0	6.1	7.0	7.5	1.6	1.3
United States	11.3	13.5	3.2	4.3	3.5	5.4	4.2	1.6	2.2
Average	10.4	14.1	7.2	5.8	5.3	6.0	5.5	1.6	1.2
G–7 Countries	9.6	12.5	4.6	4.6	3.9	4.8	4.4	1.3	1.4

Source: The Organisation for Economic Co-Operation and Development (OECD).

4.2.2 *Measuring Inflation: The Construction of Price Indexes*

Because the inflation rate is measured as the percentage change of a price index, it is important to understand how a price index is constructed so that the inflation rate derived from that index can be accurately interpreted. A **price index** represents the average prices of a basket of goods and services, and various methods can be used to average the different prices. Exhibit 3 shows a simple example of the change of a consumption basket over time.

Exhibit 3 Consumption Basket and Prices over Two Months

Time	**January 2019**		**February 2019**	
Goods	**Quantity**	**Price**	**Quantity**	**Price**
Rice	50 kg	¥3/kg	70 kg	¥4/kg
Gasoline	70 liters	¥4.4/liter	60 liters	¥4.5/liter

For January 2019, the total value of the consumption basket is:

Value of rice + Value of gasoline = (50 × 3) + (70 × 4.4) = ¥458

A price index uses the relative weight of a good in a basket to weight the price in the index. Therefore, the same consumption basket in February 2019 is worth:

Value of rice + Value of gasoline = (50 × 4) + (70 × 4.5) = ¥515

The price index in the base period is usually set to 100. So, if the price index in January 2019 is 100, then the price index in February 2019 is

$$\text{Price index in February 2019} = \frac{515}{458} \times 100 = ¥112.45 \text{ and}$$

$$\text{Inflation rate} = \frac{112.45}{100} - 1 = 0.1245 = 12.45\%$$

A price index created by holding the composition of the consumption basket constant is called a **Laspeyres index**. Most price indexes around the world are Laspeyres indexes because the survey data on the consumption basket is only available with a lag. In many countries, the basket is updated every five years. Because most price indexes are created to measure the cost of living, simply using a fixed basket of goods and services has three serious biases:

- Substitution bias: As the price of one good or service rises, people may substitute it with other goods or services that have a lower price. This substitution will result in an upward bias in the measured inflation rate based on a Laspeyres index.
- Quality bias: As the quality of the same product improves over time, it satisfies people's needs and wants better. One such example is the quality of cars. Over the years, the prices of cars have been rising but the safety and reliability of cars have also been enhanced. If not adjusted for quality, the measured inflation rate will experience another upward bias.
- New product bias: New products are frequently introduced and a fixed basket of goods and services will not include them. In general, this situation again creates an upward bias in the inflation rate.

It is relatively easy to resolve the quality bias and new product bias. Many countries adjust for the quality of the products in a basket, a practice called hedonic pricing. New products can be introduced into the basket over time. The substitution bias can be somewhat resolved by using chained price index formula. One such example is the **Fisher index**, which is the geometric mean of the Laspeyres index and the **Paasche index**. The latter is an index formula using the current composition of the basket. Using the consumption basket for February 2019 in Exhibit 3, the value of the Paasche index is

$$\begin{aligned}\text{Paasche Index}_{02/2019} = I_P &= \frac{(70 \times 4) + (60 \times 4.5)}{(70 \times 3) + (60 \times 4.4)} \times 100 \\ &= \frac{550}{474} \times 100 = 116.03\end{aligned}$$

The value of the Fisher index is

$$\text{Fisher Index}_{02/2019} = \sqrt{I_P \times I_L} = \sqrt{116.03 \times 112.45} = 114.23$$

where I_L is the Laspeyres index.

4.2.3 *Price Indexes and Their Usage*

Most countries use a consumer price index (CPI) specific to the domestic economy to track inflation. Exhibit 4 shows the different weights for various categories of goods and services in the consumer price indexes of different countries.

Exhibit 4 The Consumption Basket of Different Consumer Price Indexes

Country	China	India	India	Germany	United States	United States
Name of Index	CPI	CPI(UNME)	CPI(Urban)[c]	HICP	CPI-U	PCE
Year[a]	2016[b]	1984/85	2012	2017/18	2017/18	2009
Category (%):						
Food and Beverage	30	47.1	37.7	14	15.3	13.4
Housing and Utility	21	21.9	27.2	31.7	37.9	17.3
Furniture	6	2	3.9	5	4.2	3.4
Apparel	7.5	7	5.6	4.5	3.3	3.3
Medical Care	8	2.5	4.8	4.4	7.7	16.9
Transportation and Communication	13	5.2	9.7	16.5	15.3	9.3[d]
Education and Recreation	10.5	6.8	7.6	12.3	9.1	8.9[e]
Others	4	7.5	3.5	11.6	7.2	27.6

[a] The base year of the weights where it is appropriate.
[b] Weights for China are note released publicly. Imputed numbers given as of 2018 from Reserve Bank of Australia.
[c] India redefined the CPI bundle in 2012 for Urban consumers.
[d] Includes only transportation expenditures by consumers.
[e] Includes only recreational expenditures by consumers.
Source: Government websites and authors' calculation.

As shown in Exhibit 4, in different countries the consumer price indexes have different names and different weights on various categories of goods and services. For example, food weights are higher in the CPI for China and India, but less for the developed countries; a greater proportion of income of the average consumer goes to food in the developing countries of China and India than in the developed countries shown in Exhibit 4. For India, the weights across categories change dramatically over time as the country has developed. Weights across the categories change across time in developed countries too, but these changes tend to be much smaller. The scope of the index is also different among countries. For China and Germany, the surveys used to collect data for CPI cover both urban and rural areas. The CPI for the United States covers only urban areas using a household survey, which is why it is called the CPI-U. On the other hand, the **personal consumption expenditures** (PCE) price index covers all personal consumption in the United States using business surveys.

The **producer price index** (PPI) is another important inflation measure. The PPI reflects the price changes experienced by domestic producers in a country. Because price increases may eventually pass through to consumers, the PPI can influence the future CPI. The items in the PPI include fuels, farm products (such as grains and meat), machinery and equipment, chemical products (such as drugs and paints), transportation equipment, metals, pulp and paper, and so on. These products are usually further grouped by stage-of-processing categories: crude materials, intermediate materials, and finished goods. Similar to the CPI, scope and weights vary among countries. The differences in the weights can be much more dramatic for the PPI than for the CPI because different countries may specialize in different industries. In some countries, the PPI is called the **wholesale price index** (WPI).

As an important inflation indicator, many economic activities are indexed to a certain price index. For example, the United States' **Treasury Inflation-Protected Securities** (TIPS) adjusts the bond's principal according to the US CPI-U index. The

terms of labor contracts and commercial real estate leases may adjust periodically according to the CPI. Recurring payments in business contracts can be linked to the PPI or its sub-indexes for a particular category of products.

Central banks usually use a consumer price index to monitor inflation. For example, the European Central Bank (the ECB), the central bank for the European Union (EU) focuses on the Harmonised Index of Consumer Prices (HICP). Each member country in the EU first reports their own individual HICP and then Eurostat, the statistical office for the EU, aggregates the country level HICPs with country weights. But there are exceptions. The Reserve Bank of India follows the inflation in India using a WPI. Because food items only represent about 27% in the India WPI (much lower than the 70% in the India rural CPI), the rural CPIs can rise faster than the WPI when there is high food price inflation. Besides the weight differences, the wholesale prices in the WPI also understate market prices because they do not consider retail margins (markups). The choice of inflation indicator may also change over time. The central bank of the United States, known as the Federal Reserve Board (the Fed) once focused on the CPI-U produced by the Bureau of Labor Statistics under the US Department of Labor. Because the CPI-U is a Laspeyres index and it has the previously discussed upward biases, the Fed switched in 2000 to the PCE index, a Fisher index produced by the Bureau of Economic Analysis under the US Department of Commerce. The PCE index also has the advantage that it covers the complete range of consumer spending rather than just a basket.

Headline and Core Inflation

Headline inflation refers to the inflation rate calculated based on the price index that includes all goods and services in an economy. **Core inflation** usually refers to the inflation rate calculated based on a price index of goods and services except food and energy. Policymakers often choose to focus on the core inflation rate when reading the trend in the economy and making economic policies. The reason is that policymakers are trying to avoid overreaction to short-term fluctuations in food and energy prices that may not have a significant impact on future headline inflation.

The ultimate goal for policymakers is to control headline inflation, which reflects the actual cost of living. The fluctuations in the prices of food and energy are often the result of short-term changes in supply and demand. These changes in the prices of energy, particularly oil, are internationally determined and not necessarily reflective of the domestic business cycle. These imbalances may not persist, or even if some changes are permanent, the economy may be able to absorb them over time. These possibilities make headline inflation a noisy predictor. The core inflation rate may be a better signal of the trend in domestically driven inflation. To the extent that some trends in the headline inflation rate are permanent, policymakers need to pay attention to these as well.

Besides tracking inflation, financial analysts also use the price index to deflate GDP (i.e., to eliminate the price effect in nominal GDP data so as to identify trends in real economic growth). Many countries publish a particular price index, called the GDP deflator, for that purpose. Sub-indexes are also commonly available and may prove more valuable to an analyst with an interest in a particular industry or company.

Sub-Indexes and Relative Prices

As mentioned previously, a sub-index refers to the price index for a particular category of goods or services. **Relative price** is the price of a specific good or service in comparison with those of other goods and services. Good examples for relative prices include the prices for food and energy. The movements in a sub-index or a relative price may be difficult to detect in the headline inflation rate. Because macroeconomic policy decision-makers rely heavily on the headline inflation rate, they may not be aware of price movements at the sub-index level. These prices movements, however, can be very useful for analyzing the prospects of an industry or a company. For example, if the producer price index for the machinery used by an industry rises quickly, the allowable capital depreciation permitted by the existing tax code may not generate sufficient tax benefits for the companies in that industry to meet future replacement expenses. The future profitability of the industry may decline for this reason. The decline in prices for flat screen televisions provides an example of relative price movements. The price drop for these TVs may help to lower inflation pressure but can hurt manufacturers' profits.

EXAMPLE 10

Inflation

1 Which one of the following statements regarding the movements of overall price levels is *most* accurate?

- **A** Disinflation means that the overall price level declines.
- **B** Deflation occurs when the inflation rate turns negative.
- **C** When the price of chicken rises, the inflation rate will increase.

2 Deflation can exacerbate a recession because firms may reduce their investments and hiring when:

- **A** the slower pace of inflation lowers aggregate demand.
- **B** their revenues decline but their debt burden rises in real terms.
- **C** prices of their products continue to fall because of intense competition.

3 Which one of the following economic phenomena related to inflation cannot be determined by using observations of the inflation rate alone?

- **A** Deflation
- **B** Stagflation
- **C** Hyperinflation

4 If a price index is calculated based on a fixed basket of goods, in an inflationary environment the inflation rate calculated based on this index over time will:

- **A** overstate the actual cost of living.
- **B** understate the actual cost of living.
- **C** track the actual cost of living quite closely.

5 To adjust nominal economic growth for general price level changes in a country, an analyst would prefer to use:

- **A** the CPI.

B the GDP deflator.

C the Personal Consumption Expenditures (PCE) index.

6 To estimate the trends in sales and production costs of a given industry, an analyst would prefer to collect data on:

A the sub-index of the wholesale price index (WPI) for that industry.

B the sub-indexes of both the CPI and WPI that are relevant to the industry.

C the sub-indexes of the CPI relevant to the output and inputs of that industry.

7 Compared with core inflation, headline inflation:

A has an upward bias.

B is more subject to short-term market conditions.

C can more accurately predict future inflation.

Solution to 1:

B is correct. When the inflation rate falls below zero—that is, the overall price level declines—the economy is experiencing deflation. A is incorrect because disinflation indicates that the overall price level is rising but at a slower pace. C is incorrect because inflation measures are designed to reflect changes in the overall price level. Consumption baskets in modern economies usually contain a large number of goods and services, thus the price of a particular product usually cannot significantly influence the overall price level.

Solution to 2:

B is correct. As the prices of the output of firms fall, the firms receive lower revenues. Because the nominal amount of debt that firms carry is usually fixed, lower general price levels leads to higher debt balances in real terms. These two forces push firms closer to default, so they may scale back spending on investments and labor, which, in turn, further lowers the aggregate demand and pushes the general price level even lower. In macroeconomic analysis, it is usually the changes in aggregate demand that influence inflation instead of the reverse causality. Furthermore, neither inflation fluctuations nor aggregate demand shifts explain the potential damaging effect of deflation. Price decline attributable to the competitive environment is a microeconomic phenomenon that is not sufficient to explain the macroeconomic impact of deflation.

Solution to 3:

B is correct. A high inflation rate alone does not indicate stagflation, which happens if high unemployment occurs together with high inflation.

Solution to 4:

A is correct. Upward biases, such as the substitution bias or quality bias, will overstate the actual cost of living.

Solution to 5:

B is correct. The GDP deflator reflects the prices of the goods and services produced domestically. Both the CPI and PCE indexes are constructed using consumption baskets, and the components of a consumption basket can be very different from the components of output of that same country.

Solution to 6:

B is correct. A sub-index of the CPI reflects the market price changes of the products of an industry, whereas a sub-index of the WPI reflects the price changes of the inputs of an industry. The different composition of outputs and inputs of an industry need to be appropriately accounted for when selecting a price series. Furthermore, the WPI may not take the markups set by the industry into account.

Solution to 7:

B is correct. Headline inflation is heavily influenced by food and energy price fluctuations, which are affected by short-term supply and demand changes in these markets. These market conditions may not persist. It is also possible for an economy to absorb the price changes so that they will not have long-lasting impact on the headline inflation rate. This means headline inflation contains a great deal of noise and is not a reliable predictor of future inflation trends. The biases in various inflation measures are inherent in the index construction methodology and are not related to the price movements of the goods and services.

4.2.4 *Explaining Inflation*

Economists describe two types of inflation: **cost-push**, in which rising costs, usually wages, compel businesses to raise prices generally; and **demand-pull**, in which increasing demand raise prices generally, which then are reflected in a business's costs as workers demand wage hikes to catch up with the rising cost of living. Whatever the sequence by which prices and costs rise in an economy, the fundamental cause is the same: excessive demands—either for raw materials, finished goods, or labor—that outstrip the economy's ability to respond. The initial signs appear in the areas with the greatest constraints: the labor market, the commodity market, or in some area of final output. Even before examining particular cost and price measures, practitioners, when considering inflation, look to indicators that might reveal when the economy faces such constraints.

4.2.4.1 Cost-Push Inflation Considering cost-push inflation, analysts may look at commodity prices because commodities are an input to production. But because wages are the single biggest cost to businesses, practitioners focus most particularly on wage-push inflation, which is tied to the labor market. Because the object is to gauge demand for labor relative to capacity, the unemployment rate is key, as well as measures of the number of workers available to meet the economy's expanding needs. Obviously, the higher the unemployment rate, the lower the likelihood that shortages will develop in labor markets, whereas the lower the unemployment rate, the greater likelihood that shortages will drive up wages. Because the unemployment rate generally only counts people who are looking for work, some practitioners argue that it fails to account for the economy's full labor potential, and they state that a tight labor market will bring people out in search of work and ease any potential wage strains. To account for this issue and to modify the unemployment rate indicator, these practitioners also look at the participation rate of people in the labor force, arguing that it gives a fuller and more accurate picture of potential than the unemployment rate.

Analysis in this area recognizes that not all labor is alike. Structural factors related to training deficiencies, cultural patterns in all or some of the population, inefficiencies in the labor market, and the like can mean that the economy will effectively face labor shortages long before the unemployment rate reaches very low figures. This effective unemployment rate, below which pressure emerges in labor markets, is frequently referred to as the **non-accelerating inflation rate of unemployment** (NAIRU) or, drawing on the work of the Nobel Prize winner Milton Friedman, the **natural rate of**

unemployment (NARU). Of course, these rates vary from one economy to another and over time in a single economy. It is this rate rather than full employment that determines when an economy will experience bottlenecks in the labor market and wage-push inflationary pressures.

Take, for example, the technology sector. It has grown so rapidly in some economies that training in the labor force cannot keep up with demand. This sector can, therefore, face shortages of trained workers and attendant wage pressures even though the economy as a whole seems to have considerable slack in the overall labor market. Until training (supply) catches up with demand, that economy may experience wage and inflation pressure at rates of unemployment that in other places and circumstances might suggest ample slack in the labor market and much less wage-push pressure.

Assessments of wage-push inflation also consider direct observations of wage trends that, when they accelerate, might force businesses to raise prices (initiating the wage-price spiral mentioned earlier in this reading). Statistical agencies provide a wide array of wage-cost indicators, such as hourly wage gauges, weekly earnings, and overall labor costs, including the outlays for benefits. Some of these indicators include the effects of special overtime pay or bonuses, others do not. And although these measures give an idea of the cost to businesses and hence the kind of wage-push inflationary pressure, a complete picture only emerges when practitioners examine such trends alongside productivity measures.

Productivity, or output per hour, is an essential part of wage-push inflation analysis because the output available from each worker determines the number of units over which businesses can spread the cost of worker compensation. The greater each worker's output is per hour, the lower price businesses need to charge for each unit of output to cover hourly labor costs. And by extension, the faster output per hour grows, the faster labor compensation can expand without putting undue pressure on businesses' costs per unit of output. The equation for this **unit labor cost** (ULC) indicator, as it is called, is as follows:

$$\text{ULC} = W/O,$$

where

ULC = unit labor costs
O = output per hour per worker
W = total labor compensation per hour per worker

Many factors can affect labor productivity across time and between economies. The cyclical swings have already been described, as have the effects of technology and training. The pace of development also tends to increase worker productivity because the more sophisticated equipment, systems, and technologies workers have at their disposal, the higher their output per hour. Whatever causes the productivity growth, if it fails to keep up with worker compensation, unit costs to a business rise and, as a business tries to protect its profit margins, prices generally come under increasing upward pressure. Generally, this situation occurs because heavy demand for labor relative to available labor resources has pushed up compensation faster than productivity. Practitioners use a variety of indicators to identify cost- or wage-push inflationary pressure.

EXAMPLE 11

Unemployment Too High

Which of the following is **not** a problem with the NARU and NAIRU?

A They only work in monetarist models.

B They may change over time given changes in technology and economic structure.

C They do not account for bottlenecks in segments of the labor market (e.g., college graduates).

Solution:

A is correct. The NARU and NAIRU are the unemployment rates at which the inflation rate will not rise because of a shortage of labor. This concept does not tie to a particular school of macroeconomic models.

4.2.4.2 Demand-Pull Inflation The search for indicators from the demand-pull side of the inflation question brings practitioners back to the relationship between actual and potential real GDP and industrial capacity utilization. The higher the rate of capacity utilization or the closer actual GDP is to potential, the more likely an economy will suffer shortages, bottlenecks, a general inability to satisfy demand, and hence, price increases. The more an economy operates below its potential or the lower the rate of capacity utilization, the less such supply pressure will exist and the greater likelihood of a slowdown in inflation, or outright deflation. In addition to these macro indicators, practitioners will also look for signs of inflationary pressure in commodity prices, in part because they are a cost to business, but more as a general sign of excess demand. For an individual economy, observations of commodity prices could be misleading because commodities trade in a global market and accordingly reflect global economic conditions more than those in an individual economy.

Taking a different perspective, Monetarists contend that inflation is fundamentally a monetary phenomenon. A surplus of money, they argue, will inflate the money price of everything in the economy. Stated in terms of straightforward supply and demand relationships, a surplus of money would bring down its value just as a surplus in any market would bring down the price of the product in excess. Because the price of money is stated in terms of the products it can buy, its declining value would have an expression in higher prices generally, that is, in inflation. This Monetarist argument, as it is called, finds a simpler expression in the old saying: "inflation results when too much money chases too few goods." Although it seems distant from other explanations of inflation, in practice, it is not that distinct. Excess money causes inflationary pressure by increasing liquidity, which ultimately causes a rapid rise in demand. In this sense, the Monetarist argument is a special case under the more general heading of demand-pull concepts of inflation. The practical distinction between the monetarist and other approaches is in identifying the initial cause of the demand excess.

Practitioners can track this effect by examining various money supply indicators, usually provided by the central bank. To detect inflationary or deflationary pressure, practitioners note acceleration or deceleration in monetary growth based on past trends. Obviously, acceleration, in the absence of a special explanation, signals the potential for inflationary pressure. In applying this approach, practitioners also compare monetary growth with the growth of the nominal economy, represented by nominal GDP. If monetary growth is outpacing the growth of the nominal economy, there is deemed to be inflationary potential. This is especially the case if monetary growth has also accelerated from its trend. There is a disinflationary or deflationary potential if monetary growth lags the economy's rate of expansion, especially if it has also decelerated from its trend.

Inflation (I)

Some practitioners view the likelihood of inflationary pressure from the vantage point of the ratio of nominal GDP to money supply, commonly called the "velocity of money." If this ratio remains stable around a constant or a historical trend, they see reason to look for relative price stability. If velocity falls, it could suggest a surplus of money that might have inflationary potential, but much depends on why it has declined. If velocity has fallen because a cyclical correction has brought down the GDP numerator relative to the money denominator, then practitioners view prospects as more likely to lead to a cyclical upswing to reestablish the former relationship than inflationary pressure. If velocity has fallen, however, because of an increase in the money denominator, then inflationary pressure becomes more likely. If velocity rises, financial analysts might be concerned about a shortage of money in the economy and disinflation or deflation.

The 2008–2009 global recession and financial crisis offers an extreme example of these velocity ambiguities. As the global economy slipped into recession, which held back the GDP numerator in velocity measures, central banks, most notably the Federal Reserve in the United States, tried to help financial institutions cope by injecting huge amounts of money into their respective financial systems, raising the velocity denominator. Velocity measures plummeted accordingly. The expectation is that subsequent GDP growth as economies and financial markets heal will bring velocity back to a more normal level and trend. That said, the fear is that the monetary surge will, over the very long run, lead to inflation. For policy makers, this situation has created a very difficult policy choice. On the one side, they need to sustain the supply of money to help their respective economies cope with the after effects of the financial crisis. On the other side, they need ultimately to withdraw any monetary excess to preclude potential inflationary pressures.

4.2.5 *Inflation Expectations*

Beyond demand-pull, monetary, and cost-push inflation considerations, practitioners also need to account for the effect of inflation expectations. Once inflation becomes embedded in an economy, businesses, workers, consumers, and economic actors of every kind begin to expect it and build those expectations into their actions. This reaction, in turn, creates an inflationary momentum of its own. Such expectations give inflation something of a self-sustaining character and cause it to persist in an economy even after its initial cause has disappeared. High inflation rates persisted in the 1970s and early 1980s in Europe and the United States on the basis of expectations—even after these economies had sunk into recession. The resulting slow or negative economic growth combined with high unemployment and rising inflation was termed "stagflation."

Measuring inflation expectations is not easy. Some practitioners gauge expectations by relying on past inflation trends and on the assumption that market participants largely extrapolate their past experiences. In some markets, surveys of inflation expectations are available, although these are often biased by the way the questions are asked. Another indicator of inflation expectations becomes available when governments issue bonds, such as Treasury Inflation-Protected Securities (TIPS), that adjust in various ways to compensate holders for inflation. By comparing the interest available on these bonds with other government bonds that do not offer such inflation-linked adjustments, practitioners can gauge the general level of inflation expectations among market participants and factor it into their own inflation forecasts and strategies.

For example, if today's yield on the 10-year nominal bond of a certain country is 3.5% and the yield on the 10-year inflation-protected bond of the same country is 1.5%, we infer that the market is pricing in a 3.5% – 1.5% = 2% average annual inflation over the next 10 years. However, this calculation needs to be treated with caution

because the market for inflation-linked bonds is relatively small and thus yields can be influenced by other factors, such as the very strong demand from US pension funds seeking to match their liabilities.

EXAMPLE 12

Inflation (II)

1 To examine whether there is inflationary pressure caused by rising costs, an analyst will *most likely* gather data on:
   - **A** the growth rates of money supply and nominal GDP.
   - **B** the unemployment rate, the NAIRU, and productivity growth.
   - **C** commodity prices, past inflation trends, and expected inflation surveys.

2 The most recent macroeconomic data for an economy is given in the following table:

Variable	Value
Hourly wage growth rate	3.4%
Unit labor cost growth rate	–0.25%
Nominal GDP growth rate	3.4%
Money supply growth rate	6.7%
Implied inflation rate from government issued inflation-linked securities	2.2%

Based on the information in the table, an analyst will conclude that current inflation pressure in this economy is *most likely* caused by:
   - **A** rising wages.
   - **B** rising inflation expectations.
   - **C** bottlenecks in increasing supply to satisfy demand.

3 Cost-push inflation *most likely* occurs when:
   - **A** unemployment rates are low.
   - **B** unemployment rates are high.
   - **C** unemployment is either high or low.

4 Unit labor costs measure:
   - **A** hourly wage rates.
   - **B** total labor compensation per hour.
   - **C** a combination of hourly wages and output.

5 Demand-pull inflation:
   - **A** is a discredited concept.
   - **B** depends on the movements in commodity prices.
   - **C** reflects the state of economic activity relative to potential.

6 Monetarists believe inflation:
   - **A** reflects the growth of money.
   - **B** is driven by the level of interest rates.
   - **C** is largely a cost-push phenomenon.

7 The inflationary potential of a particular inflation rate depends on the economy's NAIRU or NARU, which, in turn, depends in part on:
   A the intensity of past cyclical swings.
   B the bargaining power of trade unions.
   C the skill set of the labor force relative to the economy's industrial mix.

8 Which of the following is *not* a problem with the NARU and NAIRU?
   A They are not observable directly.
   B They work only in monetarist models.
   C They change over time given changes in technology and economic structure.

Solution to 1:

B is correct. Comparing the current unemployment rate with the NAIRU and productivity growth with the wage growth can help an analyst determine whether inflation may be rising because of higher costs (cost-push inflation). Comparing the monetary growth with nominal GDP growth is helpful to determine whether high demand is creating inflationary pressure (demand-pull inflation). Commodity price increases could be an indicator of either cost-push or demand-pull inflation but may contain limited information in some situations. Past inflation trends and surveys on inflation expectations can help to gauge expected inflation rates; inflation expectations can be a driver of inflation even in the absence of the original underlying cause.

Solution to 2:

C is correct. The table shows that growth in the money supply has outpaced nominal GDP growth, which can result in too much money chasing too few goods. In other words, inflation pressure results from demand beyond the economy's current capacity to produce. Although the wage rate is rising, the negative unit labor cost growth rate indicates an increase in productivity. Thus, it is unlikely the economy will experience cost-push inflation. The implied inflation rate is very modest, which is unlikely to lead to a rising inflation rate.

Solution to 3:

A is correct. When unemployment is below the NAIRU, there is a shortage of labor that pushes up labor cost.

Solution to 4:

C is correct. Unit labor costs reflect the labor cost in each unit of output.

Solution to 5:

C is correct. When the economy is operating above its potential capacity allowed by the resources available, inflation will start to rise.

Solution to 6:

A is correct. Monetarists emphasize the role of money growth in determining the inflation rate, especially in the long run. As Milton Friedman famously put it: "Inflation is always and everywhere a monetary phenomenon."

Solution to 7:

C is correct. If the skill set of a large part of the labor force cannot satisfy the hiring need from the employers, the NAIRU of such an economy can be quite high.

Solution to 8:

B is correct. The NAIRU or NARU reflects the potential of an economy and thus cannot be directly observed from the economic data. They also change over time depending on technological progress and social factors.

ECONOMIC INDICATORS

5

As used in business cycle contexts, an **economic indicator** is a variable that provides information on the state of the overall economy. Economic indicators are often classified according to whether they lag, lead, or coincide with changes in an economy's growth. **Leading economic indicators** have turning points that usually precede those of the overall economy. They are believed to have value for predicting the economy's future state, usually near-term. **Coincident economic indicators** have turning points that are usually close to those of the overall economy. They are believed to have value for identifying the economy's present state. **Lagging economic indicators** have turning points that take place later than those of the overall economy. They are believed to have value in identifying the economy's past condition.

To get as clear of a picture as possible, practitioners frequently consider several related indicators simultaneously. What follows is a review of these indicators and how practitioners use them.

5.1 Popular Economic Indicators

A very useful approach for practitioners is to take an aggregate perspective on leading, lagging, and coincident indicators. These aggregate measures typically are a composite of economic indicators known respectively to lead the cycle, run coincident with it, or lag it at cyclical turns. For obvious reasons, the leading indicators in particular help with anticipating cyclical turns up or down and allow strategists and others to position themselves and their companies in a secure and timely way to benefit from movements in the economic cycle.

The exact indicators combined into these composites vary from one economy to the other. Even within an economy, they can have a remarkably diverse and eclectic character. In the United States, for instance, the composite leading indicator known as the **Index of Leading Economic Indicators** (LEI) has 10 component parts that run the gamut from orders for capital goods, to changes in consumer expectations, to swings in stock prices. Such composite indicators in other countries include equally eclectic combinations.

Similar statistics are available for numerous economies. The Conference Board, a US industry research organization, computes leading, lagging, and coincident indicators for the United States and nine other countries plus the Euro area (Eurozone). For about 30 countries and several aggregates, such as the EU and G–7, the Organisation for Economic Co-Operation and Development (OECD) calculates CLI (Composite Leading Indicators) indexes, which gauge the state of the business cycle in the economy. One of the interesting features of CLI indexes is that they are consistent across countries, and therefore, can be compared more easily to see how each region is faring. The Economic Cycle Research Institute (ECRI), a private company, also computes leading indicator indexes for about 20 countries on a weekly basis.

Although specifics for leading, coincident, and lagging indicators vary from one economy to another, they have much in common. In each case, they bring together various economic and financial measures that have displayed a consistently leading, coincident, or lagging relationship to that economy's general cycle. However, as reported

by the Conference Board, the timing record of the various composite indexes for the United States has varied over the last 50 years. The coincident index closely matches the NBER peak and trough dates, with 8 of the last 13 turning points corresponding to the beginning or end of a recession. The leading indicator index displays more variability, leading cyclical contractions by 8 to 20 months and expansions by 1 to 10 months.[12]

Exhibit 5 presents the 10 leading, 4 coincident, and 7 lagging indicators tracked for the United States by the Conference Board. In addition to naming the indicators, it also offers a general description of why each measure fits in each of the three groups.

Exhibit 5 Leading, Coincident, and Lagging Indicators—United States

Indicator and Description	Reason
Leading	
1 Average weekly hours, manufacturing	Because businesses will cut overtime before laying off workers in a downturn and increase it before rehiring in a cyclical upturn, these measures move up and down before the general economy.
2 Average weekly initial claims for unemployment insurance	This measure offers a very sensitive test of initial layoffs and rehiring.
3 Manufacturers' new orders for consumer goods and materials	Because businesses cannot wait too long to meet demands for consumer goods or materials without ordering, these gauges tend to lead at upturns and downturns. Indirectly, they capture changes in business sentiment as well, which also often leads the cycle.
4 ISM new order index[a]	This index is a diffusion index that reflects the month-to-month change in new orders for final sales. The weakening of demand, which can lead to a recession, is usually first reflected in the decline of new orders.
5 Manufacturers' new orders for non-defense capital goods excluding aircraft	In addition to offering a first signal of movement, up or down, in an important economic sector, movement in this area also indirectly captures business expectations.
6 Building permits for new private housing units	Because most localities require permits before new building can begin, this gauge foretells new construction activity.
7 S&P 500 Index	Because stock prices anticipate economic turning points, both up and down, their movements offer a useful early signal on economic cycles.
8 Leading Credit Index	This index aggregates the information from six leading financial indicators, which reflect the strength of the financial system to endure stress. A vulnerable financial system can amplify and propagate the effects of negative shocks, resulting in a widespread recession for the whole economy.

12 See pages 14 and 15 in *Business Cycle Indicators Handbook* (The Conference Board 2001).

Exhibit 5 (Continued)

Indicator and Description	Reason
Leading	
9 Interest rate spread between 10-year treasury yields and overnight borrowing rates (federal funds rate)	Because long-term yields express market expectations about the direction of short-term interest rates, and rates ultimately follow the economic cycle up and down, a wider spread, by anticipating short rate increases, also anticipates an economic upswing. Conversely, a narrower spread, by anticipating short rate decreases, also anticipates an economic downturn.
10 Average Consumer Expectations for Business and Economic Conditions	If consumers are optimistic about future business and economic conditions, they tend to increase spending. Because consumption is about two-thirds of the US economy, its future movements offers early insight into the direction ahead for the whole economy.
Coincident	
1 Employees on non-agricultural payrolls	Once recession or recovery is clear, businesses adjust their fulltime payrolls.
2 Aggregate real personal income (less transfer payments)	By measuring the income flow from non-corporate profits and wages, this measure captures the current state of the economy.
3 Industrial Production Index	Measures industrial output, thus capturing the behavior of the most volatile part of the economy. The service sector tends to be more stable.
4 Manufacturing and trade sales	In the same way as aggregate personal income and the industrial production index, this aggregate offers a measure of the current state of business activity.
Lagging	
1 Average Duration of Unemployment	Because businesses wait until downturns look genuine to lay off, and wait until recoveries look secure to rehire, this measure is important because it lags the cycle on both the way down and the way up.
2 Inventory–sales ratio	Because inventories accumulate as sales initially decline and then, once a business adjusts its ordering, become depleted as sales pick up, this ratio tends to lag the cycle.
3 Change in unit labor costs	Because businesses are slow to fire workers, these costs tend to rise into the early stages of recession as the existing labor force is used less intensely. Late in the recovery when the labor market gets tight, upward pressure on wages can also raise such costs. In both cases, there is a clear lag at cyclical turns.
4 Average bank prime lending rate	Because this is a bank administered rate, it tends to lag other rates that move either before cyclical turns or with them.
5 Commercial and industrial loans outstanding	Because these loans frequently support inventory building, they lag the cycle for much the same reason that the inventory–sales ratio does.

(continued)

Exhibit 5 (Continued)

Lagging		
6	Ratio of consumer installment debt to income	Because consumers only borrow heavily when confident, this measure lags the cyclical upturn, but debt also overstays cyclical downturns because households have trouble adjusting to income losses, causing it to lag in the downturn.
7	Change in consumer price index for services	Inflation generally adjusts to the cycle late, especially the more stable services area.

[a] A diffusion index usually measures the percentage of components in a series that are rising in the same period. It indicates how widespread a particular movement in the trend is among the individual components.

Let us consider a few examples that show the use of these statistics in identifying a business cycle phase. An increase in the reported ratio of consumer installment debt to income lags (occurs after) cyclical upturns; so the increase, by itself, would be evidence that an upturn has been underway. That could confirm the implication of positive changes in coincident indicators that an expansion is in place. As a leading economic indicator, a positive change in the S&P 500 Index is supposed to lead (come before) an increase in aggregate economic activity. An increase in the S&P 500 would be positive for future economic growth, all else equal. However, if the S&P 500 showed an increase but the aggregate index did not, we would likely not draw a positive conclusion. For a final example, if we observed that the LEI moved up a small amount on two consecutive observations, we might conclude that a modest economic expansion is expected.

The component indicators for other countries, though different in specifics, are similar in most respects. The Eurozone, for instance, composes its leading index from eight components:

1. Economic sentiment index
2. Residential building permits
3. Capital goods orders
4. The Euro Stoxx Equity Index
5. M2 money supply
6. An interest rate spread
7. Eurozone Manufacturing Purchasing Managers Index
8. Eurozone Service Sector Future Business Activity Expectations Index

The parallels between many of these components and those used in the United States are clear, but Europe has a services component in its business activity measures that the United States lacks, whereas Europe forgoes many of the overtime and employment gauges that the United States includes.

Japan's leading index contains 10 components:

1. New orders for machinery and construction equipment
2. Real operating profits
3. Overtime worked
4. Dwelling units started
5. Six-month growth rate in labor productivity
6. Business failures
7. Business confidence (Tankan Survey)

8 Stock prices

9 Real M2 money supply

10 Interest rate spread

Again, many are similar, but Japan includes labor market indicators more like the United States than Europe and adds a measure of business failures not included in the other two.

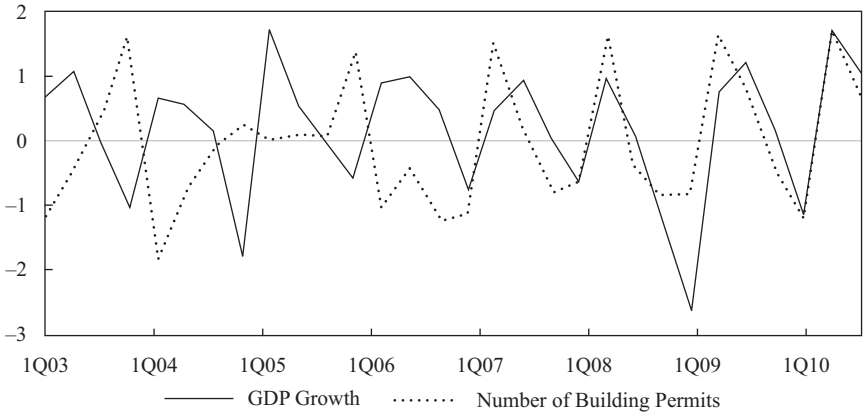
Similarities and differences along these lines appear in indicators for the United Kingdom, Australia, South Africa, specific European economies, and other countries. The general tone is, however, similar to the detail provided here for the United States.

Building Permits as a Leading Economic Indicator

Exhibit 6 shows an example of a leading economic indicator in Germany, the granted building permits along with its relationship to the growth of Germany's GDP. In Exhibit 6, the growth rate of building permits usually peaks one quarter ahead of the GDP growth rate, with the exception for the first half of 2008 and 2010. Before 2006, the growth rate of building permits usually bottomed out earlier than the GDP growth rate by four quarters. Between 2006 and 2010, the troughs of the two series almost coincide. After 2010, the relationship becomes very unstable as the financial crisis significantly impacted the housing sector.

This uncertainty of the relationships between an indicator and business cycles is very common. Some indicators may be good predictors for economic expansions but poor predictors for recessions. Structural changes in the economy or significant economic disruptions can completely alter previous relationships between indicators and economic variables or interest. This uncertainty is why economists and statisticians often combine different indicators and try to find common factors among them when building indicator indexes.

Exhibit 6 The Growth Rates of Germany GDP and Number of Building Permits



Note: The quarter-to-quarter growth rates are normalized by using the standard deviations of the two series, respectively.
Source: Federal Statistical Office of Germany.

Diffusion Index of Economic Indicators

In the United States, the Conference Board also compiles a monthly diffusion index of the leading, lagging, and coincident indicators. The **diffusion index** reflects the proportion of the index's components that are moving in a pattern consistent with the overall index. Analysts often rely on these diffusion indexes to provide a measure of the breadth of the change in a composite index.

For example, the Conference Board tracks the growth of each of the 10 constituents of its leading indicator measure, assigning a value of 1.0 to each indicator that rises by more than 0.05% during the monthly measurement period, a value of 0.5 for each component indicator that changes by less than 0.05%, and a value of 0 for each component indicator that falls by more than 0.05%. These assigned values, which of course differ in other indexes in other countries, are then summed and divided by 10 (the number of components). Then to make the overall measure resemble the more familiar indexes, the Board multiplies the result by 100.

A simple numerical example will help explain. Say, for ease of exposition, the indicator has only four component parts: stock prices, money growth, orders, and consumer confidence. In one month, stock prices rise 2.0%, money growth rises 1.0%, orders are flat, and consumer confidence falls by 0.6%. Using the Conference Board's assigned values, these would contribute respectively: 1.0 + 1.0 + 0.5 + 0 to create a numerator of 2.5. When divided by four (the number of components) and multiplied by 100, it generates an indicator of 62.5 for that month.

Assume that the following month stock prices fall 0.8%, money grows by 0.5%, orders pick up 0.5%, and consumer confidence grows 3.5%. Applying the appropriate values, the components would add to 0 + 1.0 + 1.0 + 1.0 = 3.0. Divided by the number of components and multiplied by 100, this yields an index value of 75. The 20.0% increase in the index value means more components of the composite index are rising. Given this result, an analyst can be more confident that the higher composite index value actually represents broader movements in the economy. In general, a diffusion index does not reflect outliers in any component (like a straight arithmetic mean would do) but instead tries to capture the overall change common to all components.

5.2 Other Variables Used as Economic Indicators

In addition to this array of measures, public agencies and trade associations provide aggregate cyclical measures. These may include surveys of industrialists, bankers, labor associations, and households on the state of their finances, level of activity, and their confidence in the future. In the United States, for instance, the Federal Reserve polls its 12 branches for a qualitative report on business activity and expectations in their respective regions. It summarizes those findings in what it calls the "Beige Book" released every 6 weeks. Also in the United States, the Institute of Supply Management (ISM) polls its members to build indexes of manufacturing orders, output, employment, pricing, and comparable gauges for services. Over the last decade, so-called "purchasing managers" indexes along the lines of the ISM have been introduced in a wide range of countries, including Europe and China. Japan's industrial organization polls its members in a similar way and releases the findings in what is called the "Tankan Report." These diverse sources multiply within and across economies. Practitioners can use these sources to assess whether they confirm or contradict other more broad-based cyclical indicators, giving pause to, or greater confidence in, those earlier conclusions.

Using a statistical technique called "principal components analysis," the Federal Reserve Bank of Chicago computes the Chicago Fed National Activity Index (CFNAI). The CFNAI is computed using 85 monthly macroeconomic series. These series cover industrial production, personal income, capital utilization, employment by sectors, housing starts, retail sales, and so on. Principal components analysis "extracts" the

underlying trend that is common to most of these variables, thus distilling the essence of the US business cycle. Similarly, the Bank of Italy in conjunction with the Centre for Economic Policy Research (CEPR) produces the Euro–Coin statistic, which is also based on principal component analysis. There are more than one hundred macroeconomic series included in Euro–Coin. The Euro–Coin also includes data derived from surveys, interest rates, and other financial variables. Both CFNAI and Euro–Coin are freely available online.

EXAMPLE 13

Economic Indicators

1 Leading, lagging, and coincident indicators are:

A the same worldwide.

B based on historical cyclical observations.

C based on Keynesian and/or Monetarist theory.

2 A diffusion index:

A measures growth.

B reflects the consensus change in economic indicators.

C is roughly analogous to the indexes used to measure industrial production.

3 In the morning business news, a financial analyst, Kevin Durbin, learned that average hourly earnings had increased last month. The most appropriate action for Durbin is to:

A call his clients to inform them of a good trading opportunity today.

B examine other leading indicators to see any confirmation of a possible turning point for the economy.

C use the news in his research report as a confirmation for his belief that the economy has recovered from a recession.

4 The following table shows the trends in various economic indicators in the two most recent quarters:

Economic Indicator	Trend
Interest rate spread between long-term government bonds and overnight borrowing rate	Narrowing
New orders for capital goods	Declining
Residential building permits	Declining
Employees on non-agricultural payrolls	Turned from rising to falling
Manufacturing and trade sales	Stable
Average duration of unemployment	Small decline
Change in unit labor costs	Rising

Given the information, this economy is *most likely* experiencing a:

A continuing recession.

B peak in the business cycle.

C strong recovery out of a trough.

5 The indicator indexes created by various organizations or research agencies:

A include only leading indicators to compute their value.

B are highly reliable signals on the phase of business cycles.

C evolve over time in terms of composition and computation formula.

6 Which one of the following trends in various economic indicators is *most* consistent with a recovery from a recession?

A A declining inventory-to-sales ratio and stable industrial production index.

B A rising broad stock market index and unit labor costs turning from increasing to decreasing.

C A decrease in average weekly initial claims for unemployment insurance and an increase in aggregate real personal income.

Solution to 1:

B is correct. The recognition of economic indicators is based on empirical observations for an economy.

Solution to 2:

B is correct. The diffusion indexes are constructed to reflect the common trends embedded in the movements of all the indicators included in such an index.

Solution to 3:

B is correct. Financial analysts need to synthesize the information from various indicators in order to gather a reliable reading of the economic trends.

Solution to 4:

B is correct. The first three indicators are leading indicators and all of them are indicating an impending recession, which means the economy has reached the peak in this cycle. Non-agricultural payrolls and manufacturing and trade sales are coincident indicators. The trends in these two variables further indicate that the economy may begin to decline. The trends in the last two indicators—both lagging indicators—indicate that the economy may either continue to grow or it may be close to a peak. Aggregating the signals given by all three groups of economic indicators, it appears the economy may be near the peak of a business cycle.

Solution to 5:

C is correct. The indicator indexes are constantly updated for their composition and methodology based on the accumulation of empirical knowledge, and they can certainly include more than just leading indicators.

Solution to 6:

C is correct. The improving leading indicator, average weekly initial claims for unemployment insurance, and the improving coincident indicator, aggregate real personal income, are most consistent with an economic recovery. Even though a declining inventory-to-sales ratio, a lagging indicator, is consistent with an early recovery, the coincident indicator, the stable industrial production index, does not support that conclusion. Although a rising stock market index can signal economic expansion, the lagging indicator, the unit labor costs, has peaked, which is more consistent with a recession.

SUMMARY

This reading has summarized business cycle analysis. Among the points made are the following:

- Business cycles are a fundamental feature of market economies but their amplitude and/or length vary considerably.
- Business cycles have four phases: trough, expansion, peak, and contraction.
- Keynesian theories focus on fluctuations of aggregate demand (AD). If AD shifts left, Keynesians advocate government intervention to restore full employment and avoid a deflationary spiral. Monetarists argue that the timing of the impact from government policies is uncertain and it is generally better to let the economy find its new equilibrium unassisted, but ensure that the money supply is kept growing at an even pace.
- New Classical and Real Business Cycle (RBC) theories also consider fluctuations of aggregate supply (AS). If AS shifts left because of an input price increase or right because of a price decrease or technical progress, the economy will gradually converge to its new equilibrium. Government intervention is generally not necessary because it may exacerbate the fluctuation or delay the convergence to equilibrium. New Keynesians argue that frictions in the economy may prevent convergence and government policies may be needed.
- The demand for factors of production may change in the short run as a result of changes in all components of GDP: consumption (e.g., households worry about the future, save more, and thus shift AD left), investment (e.g., companies expect customers to increase demand and buy new equipment, thus shifting AD right; another example is that companies introduce new technologies, thus shifting long-term AS right), government (e.g., fiscal and monetary policies shift AD), and net exports (e.g., faster growth in other countries generates higher demand for the home country's products, thus shifting AD, or higher prices of imported inputs shift AS left). Any shifts in AD and AS will affect the demand for the factors of production (capital and labor) that are used to produce the new level of GDP.
- Unemployment has different subcategories. Frictional (people that are not working because they are in between jobs); structural (people that are unemployed because they do not have the skills required by the openings or reside far away from the jobs); discouraged workers are unemployed people who have given up looking for jobs because they do not believe they can find one (they are considered outside the labor force in unemployment statistics); and voluntarily unemployed are people who do not wish to work, for example because they are in school, retired early, or very rich (they are also considered outside the labor force in unemployment statistics).
- There are different types of inflation. Hyperinflation indicates a high (e.g., 100% annual) and increasing rate of inflation; deflation indicates a negative inflation rate (prices decrease); imported inflation is associated with increasing cost of inputs that come from abroad; demand inflation is caused by constraints in production that prevent companies from making as many goods as the market demands (it is sometimes called wartime inflation because in times of war, goods tend to be rationed).

- Economic indicators are statistics on macroeconomic variables that help in understanding which stage of the business cycle an economy is at. Of particular importance are the leading indicators, which suggest where the economy is likely to be in the near future. No economic indicator is perfect, and many of these statistics are subject to periodic revisions.
- Price levels are affected by real factors and monetary factors. Real factors include aggregate supply (an increase in supply leads to lower prices) and aggregate demand (an increase in demand leads to higher prices). Monetary factors include the supply of money (more money circulating, if the economy is in equilibrium, will lead to higher prices) and the velocity of money (higher velocity, if the economy is in equilibrium, will lead to higher prices).
- Inflation is measured by many indexes. Consumer price indexes reflect the prices of a basket of goods and services that is typically purchased by a normal household. Producer price indexes measure the cost of a basket of raw materials, intermediate inputs, and finished products. GDP deflators measure the price of the basket of goods and services produced within an economy in a given year. Core indexes exclude volatile items, such as agricultural products and energy, whose prices tend to vary more than other goods.

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PRACTICE PROBLEMS

1 The characteristic business cycle patterns of trough, expansion, peak, and contraction are:
   A periodic.
   B recurrent.
   C of similar duration.

2 During the contraction phase of a business cycle, it is *most likely* that:
   A inflation indicators are stable.
   B aggregate economic activity is decreasing.
   C investor preference for government securities declines.

3 An economic peak is *most* closely associated with:
   A accelerating inflation.
   B stable unemployment.
   C declining capital spending.

4 Based on typical labor utilization patterns across the business cycle, productivity (output per hours worked) is *most likely* to be highest:
   A at the peak of a boom.
   B into a maturing expansion
   C at the bottom of a recession.

5 As the expansion phase of the business cycle advances from early stage to late stage, businesses *most likely* experience a decrease in:
   A labor costs.
   B capital investment.
   C availability of qualified workers.

6 An analyst writes in an economic report that the current phase of the business cycle is characterized by accelerating inflationary pressures and borrowing by companies. The analyst is *most likely* referring to the:
   A peak of the business cycle.
   B contraction phase of the business cycle.
   C early expansion phase of the business cycle.

7 In a recession, companies are *most likely* to adjust their stock of physical capital by:
   A selling it at fire sale prices.
   B not maintaining equipment.
   C quickly canceling orders for new construction equipment.

8 The inventory/sales ratio is *most likely* to be rising:
   A as a contraction unfolds.
   B partially into a recovery.
   C near the top of an economic cycle.

9 The Austrian economic school attributes the primary cause of the business cycle to:
   A misguided government intervention.

B the creative destruction of technological progress.

C sticky price and wage expectations that exaggerate trends.

10 A decrease in a country's total imports is *most likely* caused by:

A an increase in the pace of domestic GDP growth.

B a cyclical downturn in the economies of primary trading partners.

C persistent currency depreciation relative to primary trading partners.

11 Monetarists favor a limited role for the government because they argue:

A government policy responses may lag.

B firms take time to adjust to systemic shocks to the economy.

C resource use is efficient with marginal revenue and cost equal.

12 The discouraged worker category is defined to include people who:

A are overqualified for their job.

B could look for a job but choose not to.

C currently look for work without finding it.

13 According to the Austrian school, the *most appropriate* government response to an economic recession is to:

A allow the market to adjust naturally.

B maintain steady growth in the money supply.

C decrease the market rate of interest below its natural value.

14 A national government responds to a severe recession by funding numerous infrastructure projects using deficit spending. Which school of economic thought is *most* consistent with such action.

A Keynesian

B Monetarist

C Neoclassical

15 According to Real Business Cycle models, an economic contraction is *most likely* caused by:

A sticky wages.

B rising energy prices.

C a contraction in the money supply.

16 The unemployment rate is considered a lagging indicator because:

A new job types must be defined to count their workers.

B multi-worker households change jobs at a slower pace.

C businesses are slow to hire and fire due to related costs.

17 The category of persons who would be *most likely* to be harmed by an increase in the rate of inflation is:

A homeowners with fixed 30-year mortgages.

B retirees relying on a fixed annuity payment.

C workers employed under contracts with escalator clauses.

18 A decrease in both the labor force participation ratio and the unemployment rate is *most likely* caused by:

A an increase in discouraged workers.

B an increase in underemployed workers.

C a decrease in voluntarily unemployed persons.

19 The term that describes when inflation declines but nonetheless remains at a positive level is:

A deflation.

B stagflation.

C disinflation.

20 During an economic recovery, a lagging unemployment rate is *most likely* attributable to:

A businesses quickly rehiring workers.

B new job seekers entering the labor force.

C underemployed workers transitioning to higher-paying jobs.

21 The treasury manager of a large company has recently left his position to accept a promotion with a competitor six months from now. A statistical employment survey conducted now should categorize the status of the former treasury manager as:

A underemployed.

B voluntarily unemployed.

C frictionally unemployed.

22 Deflation is *most likely* to be associated with:

A a shortage of government revenue.

B substantial macroeconomic contraction.

C explicit monetary policy to combat inflation.

23 The *least likely* consequence of a period of hyperinflation is the:

A reduced velocity of money.

B increased supply of money.

C possibility of social unrest.

The following information relates to Questions 24–25

Exhibit 1 Consumption Baskets and Prices Over Two Months

Date	November 2010		December 2010	
Goods	**Quantity**	**Price**	**Quantity**	**Price**
Sugar	70 kg	€ 0.90 / kg	120 kg	€ 1.00 / kg
Cotton	60 kg	€ 0.60 / kg	50 kg	€ 0.80 / kg

24 Assuming the base period for 2010 consumption is November and the initial price index is set at 100, then the inflation rate after calculating the December price index as a Laspeyres index is *closest* to:

A 19.2%.

B 36.4%.

C 61.6%.

25 For the December consumption basket in Exhibit 1, the value of the Paasche index is *closest* to:

A 116.

B 148.

C 160.

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26 A central bank will *most likely* allow the economy to self-correct in periods of:

A high inflation, fast economic growth, and low unemployment.

B low inflation, slow economic growth, and high unemployment.

C high inflation, slow economic growth, and high unemployment.

27 Disinflation is *best* described as a:

A decline in price levels.

B negative inflation rate.

C decline in the inflation rate.

28 The characteristic of national consumer price indexes which is *most* typically shared across major economies worldwide is:

A the geographic areas covered in their surveys.

B the weights they place on covered goods and services.

C their use in the determination of macroeconomic policy.

29 Of the following statements regarding the Producer Price Index (PPI), which is the *least likely*? The PPI:

A can influence the future CPI.

B category weights can vary more widely than analogous CPI terms.

C is used more frequently than CPI as a benchmark for adjusting labor contract payments.

30 The following presents selected commodity price data for July–August 2015:

	July 2015		August 2015	
Goods	**Quantity**	**Price**	**Quantity**	**Price**
Milk	18	€1.00/L	17	€1.00/L
Orange juice	6	€2.00/L	4	€2.50/L

Given the consumption basket and prices presented, which type of price index will result in the highest calculated inflation rate over a two-month time period?

A One that uses a current consumption basket

B One that uses a constant consumption basket

C One reflecting substitutions made by consumers over time

31 The inflation rate *most likely* relied on to determine public economic policy is:

A core inflation.

B headline inflation.

C index of food and energy prices.

32 What is the *most* important effect of labor productivity in a cost-push inflation scenario?

A Rising productivity indicates a strong economy and a bias towards inflation.

B The productivity level determines the economy's status relative to its "natural rate of unemployment."

C As productivity growth proportionately exceeds wage increases, product price increases are less likely.

33 Which of the following statements is the *best* description of the characteristics of economic indicators?

A Leading indicators are important because they track the entire economy.

B Lagging indicators in measuring past conditions do not require revisions.

C A combination of leading and coincident indicators can offer effective forecasts.

34 A product is part of a price index based on a fixed consumption basket. If, over time, the product's quality improves while its price stays constant, the measured inflation rate is *most likely*:

A unaffected.

B biased upward.

C biased downward.

35 A price index of goods and services that excludes food and energy is *most likely* used to calculate:

A core inflation.

B the GDP deflator.

C headline inflation.

36 When the spread between 10-year US Treasury yields and the federal funds rate narrows and at the same time the prime rate stays unchanged, this mix of indicators *most likely* forecasts future economic:

A growth.

B decline.

C stability.

37 Which of the following economic developments is *most likely* to cause cost-push inflation?

A Industrial capacity utilization rises to a very high level.

B Labor productivity increases faster than hourly labor costs.

C A shortage of trained workers emerges throughout the economy.

38 An economist expects the following:

- The decline in the unemployment rate will result in higher revenues for home retailers.
- A tighter labor market will put upward pressure on wages, compelling home retailers to raise prices.

Which type of inflation *best* corresponds to the economist's expectations?

A Stagflation

B Cost-push inflation

C Demand-pull inflation

39 If relative to prior values of their respective indicators, the inventory–sales ratio has risen, unit labor cost is stable, and real personal income has decreased, it is *most likely* that a peak in the business cycle:

A has occurred.

B is just about to occur.

C will occur sometime into the future.

40 Current economic statistics indicating little change in services inflation, rising residential building permits, and increasing average duration of unemployment are *best* interpreted as:

A conflicting evidence about the direction of economy.

B evidence that a cyclical upturn is expected to occur in the future.

C evidence that a cyclical downturn is expected to occur in the future.

41 When aggregate real personal income, industrial output, and the S&P 500 Index all increase in a given period, it is *most accurate* to conclude that a cyclical upturn is:

A occurring.

B about to end.

C about to begin.

42 Which of the following is *most likely* to increase after an increase in aggregate real personal income?

A Equity prices

B Building permits for new private housing units

C The ratio of consumer installment debt to income

43 Which of the following indicators is *most* appropriate in predicting a turning point in the economy?

A The Industrial Production Index

B The average bank prime lending rate

C Average weekly hours, manufacturing

SOLUTIONS

1 B is correct. The stages of the business cycle occur repeatedly over time.

2 B is correct. The net trend during contraction is negative.

3 A is correct. Inflation is rising at peaks.

4 C is correct. At the end of a recession, firms will run "lean production" to generate maximum output with the fewest number of workers.

5 C is correct. When an economy's expansion is well established, businesses often have difficulty finding qualified workers.

6 A is correct. Accelerating inflation and rapidly expanding capital expenditures typically characterize the peak of the business cycle. During such times, many businesses finance their capital expenditures with debt to expand their production capacity.

7 B is correct. Physical capital adjustments to downturns come through aging of equipment plus lack of maintenance.

8 C is correct. Near the top of a cycle, sales begin to slow before production is cut, leading to an increase in inventories relative to sales.

9 A is correct. Austrian economists see monetary policy mistakes as leading to booms and busts.

10 C is correct. When a nation's currency depreciates, domestic goods seem cheaper than foreign goods, placing downward pressure on demand for imports. When the depreciation persists for some time, the country's total imports are likely to decrease.

11 A is correct. Monetarists caution policy effects can occur long after the need for which they were implemented is no longer an issue.

12 B is correct. Discouraged workers are defined as persons who have stopped looking for work and are outside the labor force.

13 A is correct. Austrian economists advocate limited government intervention in the economy. They advise that the best thing to do in a recession is to allow the necessary market adjustment to take place.

14 A is correct. Keynesian economics is based on government intervention in the form of fiscal policy. The national government responds to the recession by using deficit spending to fund infrastructure projects.

15 B is correct. Real Business Cycle models conclude that expansions and contractions of the economy are responses to external shocks, such as supply shocks arising from advances in technology or changes in the relative prices of inputs (e.g., energy prices). An increase in energy prices shifts short-run aggregate supply to the left, resulting in higher prices and lower GDP.

16 C is correct. This effect makes unemployment rise more slowly as recessions start and fall more slowly as recoveries begin.

17 B is correct. With inflation, a fixed amount of money buys fewer goods and services, thus reducing purchasing power.

18 A is correct. Discouraged workers have given up seeking employment and are statistically outside the labor force. Therefore, an increase in discouraged workers will decrease the labor force and thus the labor participation ratio, which is the ratio of labor force to total working age population. Additionally, an increase in discouraged workers will decrease the unemployment rate because discouraged workers are not counted in the official unemployment rate.

19 C is correct. Disinflation is known as a reduction of inflation from a higher to lower, but still above zero, level.

20 B is correct. In an economic recovery, new job seekers return to the labor force, and because they seldom find work immediately, their return may initially raise the unemployment rate.

21 C is correct. Frictionally unemployed people are not working at the time of the employment survey but have recently left one job and are about to start another job. The frictionally unemployed have a job waiting for them and are not 100% unemployed, it is just that they have not started the new job yet. Although the treasury manager has left his current employment, he has accepted a new position at another firm starting in six months.

22 B is correct. Deflation is connected to a vicious cycle of reduced spending and higher unemployment.

23 A is correct. In hyperinflation, consumers accelerate their spending to beat prices increases and money circulates more rapidly.

24 A is correct. The Laspeyres index is calculated with these inputs:

- November consumption bundle: $70 \times 0.9 + 60 \times 0.6 = 99$
- December consumption bundle: $70 \times 1 + 60 \times 0.8 = 118$
- December price index: $(118/99) \times 100 = 119.19$
- Inflation rate: $(119.19/100) - 1 = 0.1919 = 19.19\%$

25 A is correct. The Paasche index uses the current product mix of consumption combined with the variation of prices. So for December, its value is

$$(120 \times 1 + 50 \times 0.8)/(120 \times 0.9 + 50 \times 0.6) = (160/138) \times 100 = 115.9$$

26 C is correct. This scenario is often referred to as stagflation. Here, the economy is likely to be left to self-correct because no short-term economic policy is thought to be effective.

27 C is correct. Disinflation is a decline in the inflation rate—for example, from 7% to 4%.

28 C is correct. Central banks typically use consumer price indexes to monitor inflation and evaluate their monetary policies.

29 C is correct. The CPI is typically used for this purpose, while the PPI is more closely connected to business contracts.

30 B is correct. The inflation rate calculated by using a constant consumption basket (the Laspeyres index) is 10%, derived as follows:

$$\begin{aligned}
\text{July 2015 consumption basket} &= (18 \times €1) + (6 \times €2) = €30 \\
\text{August 2015 consumption basket} &= (18 \times €1) + (6 \times €2.5) = €33 \\
\text{Value of the Laspeyres index } (I_L) &= (€33/€30) \times 100 = €110 \\
\text{Inflation rate} &= (110/100) - 1 = 0.10 = 10\%
\end{aligned}$$

The inflation rate calculated using a current consumption basket (the Paasche index) is 8%, derived as follows:

$$\begin{aligned}
\text{July 2015 consumption basket} &= (17 \times €1) + (4 \times €2) = €25 \\
\text{August 2015 consumption basket} &= (17 \times €1) + (4 \times €2.5) = €27 \\
\text{Value of the Paasche index } (I_P) &= (€27/€25) \times 100 = €108 \\
\text{Inflation rate} &= (108/100) - 1 = 0.08 = 8\%
\end{aligned}$$

The inflation rate calculated by "chaining" the monthly prices of consumption baskets as they change over time (the Fisher index) is derived as follows:

$$\text{Value of the Fisher index} = \sqrt{I_P \times I_L}$$

$$\text{Value of the Fisher Index} = \sqrt{€110 \times €108} = €108.99$$

$$\text{Inflation rate} = (108.99/100) - 1 = 0.0899 = 8.99\%$$

31 A is correct. Core inflation is less volatile since it excludes food and energy prices and therefore will not be as likely to lead to policy overreactions when serving as a target.

32 C is correct. For productivity, or output per hour, the faster that it can grow, the further that wages can rise without putting pressure on business costs per unit of output.

33 C is correct. While no single indicator is definitive, a mix of them—which can be affected by various economic determinants—can offer the strongest signal of performance.

34 B is correct. As the quality of a product improves, it satisfies people's needs and wants better. The measured inflation rate is skewed higher than otherwise unless an adjustment is made for the increase in the quality of the good. Even if the good's price had increased over time, the improvements in quality would still bias the measured inflation rate upward.

35 A is correct. A price index of goods and services that excludes food and energy is used to calculate core inflation. Policymakers often use core inflation when reading the trend in the economy and making economic policies. The reason is because policymakers are trying to avoid overreaction to short-term fluctuations in prices as a result of short-term changes in supply and demand.

36 B is correct. The narrowing spread of this leading indicator foretells a drop in short-term rates and a fall in economic activity. The prime rate is a lagging indicator and typically moves after the economy turns.

37 C is correct. Cost-push inflation occurs when rising costs compel businesses to raise prices generally. A shortage of trained workers leads to wage pressures, and even if such shortages impact only certain sectors of the economy, the economy overall may experience inflationary pressure.

38 B is correct. Cost-push inflation refers to the situation in which rising costs, usually wages, compel businesses to raise prices.

39 A is correct. Both inventory–sales and unit labor costs are lagging indicators that decline somewhat after a peak. Real personal income is a coincident indicator that by its decline shows a slowdown in business activity.

40 B is correct. Rising building permits—a leading indicator—indicates that an upturn is expected to occur or continue. Increasing average duration of unemployment—a lagging indicator—indicates that a downturn has occurred, whereas the lack of any change in services inflation—also a lagging indicator—is neither negative nor positive for the direction of the economy. Taken together, these statistics indicate that a cyclical upturn may be expected to occur.

41 A is correct. Aggregate real personal income and industrial output are coincident indicators, whereas the S&P 500 is a leading indicator. An increase in aggregate personal income and industrial output signals that an expansion is occurring, whereas an increase in the S&P 500 signals that an expansion will occur or is expected to continue. Taken together, these statistics indicate that a cyclical upturn is occurring.

42 C is correct. Aggregate real personal income is a coincident indicator of the business cycle and the ratio of consumer installment debt to income is a lagging indicator. Increases in the ratio of consumer installment debt follows increases in average aggregate income during the typical business cycle.

43 C is correct. Leading economic indicators have turning points that usually precede those of the overall economy. Average weekly hours, manufacturing is a leading economic indicator. The Industrial Production Index is a coincident economic indicator, and the average bank prime lending rate is a lagging economic indicator.