Understanding Business Cycles

Abstract

Keywords
Keyword1 — Keyword2 — Keyword3

12a	Calculate and interpret price, income and cross-price elasticities of demand and describe factors that affect each measure
12b	Compare substitution and income effects
12c	Distinguish between normal goods and inferior goods
12d	Describe the phenomenon of diminishing marginal returns
12e	Determine and interpret breakeven and shutdown points of production
12f	Describe how economies of scale and diseconomies of scale affect costs

Contents

1. Overview

The business cycle is first and foremost only observable in economies relying in business enterprises, as opposed to economies relying in agragrian societies or centrally planned economies. Secondly, a cycle has an expected sequence of phases between expansions and contractions. Each of this phase is transversal to all the sectors within the economy. Third, cycles are recurrent but they lack periodicity (they can either occur every 1 or 10 years).

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.

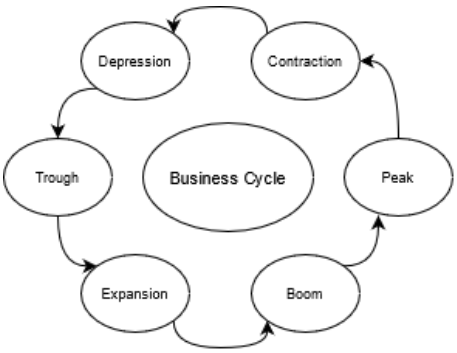

Figure 1. Overview of Business Cycles

Breaking down the Business Cycle

The typical business cycle consists of four phases: trough, expansion, peak and contraction. The period of expansion occurs after the **trough** (lowest point) and before its **peak**. The trough and peak represent turning points on the business cycle. The contraction period occurs between the peak and the trough. They contraction period is often called recession or, if exceptionally severe, a depression.

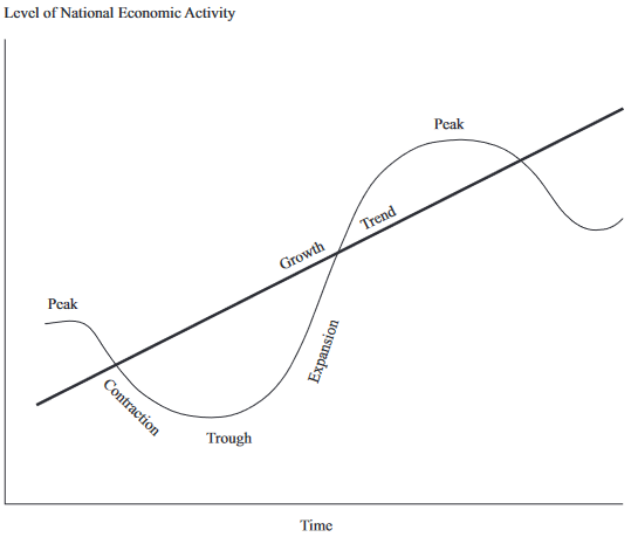

Figure 2. Representation of a Business Cycle

	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.

Figure 3. Characteristics overview

Resource Use through Business Cycle

When a downturn starts, aggregate demand decreases and inventories start to accumulate. Companies adjust production by reduction costs such as labor hours (eliminating overtime shifts) and temporary contracts. If the downturn deepens, companies assume more drastic measures and start cutting costs aggressively, cutting all non essencial costs. This involves terminating contracts and reducing production capacity utilization. Banks will tighten the money flow because bankruptcy risks are perceived higher.

As prices continuously drop, eventually some companies and households decide to pick up some businesses and invest in structures, housing and durable goods, reaching the turning point.

When economic activity increases, enterprises will carefully readjust production and replenish inventories, eventually hiring new workers. This phase is often called inventory rebuilding. As aggregate demand continues to grow, a boom phase occurs. In a boom phase, demand can easily offset supply creating shortages. It is possible that the excess demand triggers overly optimistic expectations of future demand, leading to overinvestment sometimes.

Capital Spending

In the early stage of contraction, the downturn in spending on equipment occurs abruptly after demand for companies products starts to decrease. Businesses seeing decline in sales and profits will halt or cancel existing orders until the investment is again perceived necessary. The initial cutbacks in investment exacerbate the economy contraction.

In the early stages of expansion, when economies begin to recover and sales are still low businesses arent likely to invest as they still have excessive productive capacity. Once orders and cash flow becomes convincing, managers will start reinvesting.

Fluctuation in Inventory

Toward the peak of economic cycle, businesses may lag cutting back excess production leading to inventory increase. The lower inventory to sales ratio may indicate weakening economy as aggregate demand decreases.

As sales begin their cyclical upturn, businesses may initially failt to adjust production causing a decrease inventory.

Consumer Behavior

Households are the most important economic agent representing about 70% of modern economies. As a result, patterns of household consumption determine overall economic direction more than any other economic participant. Patterns of household consumption are the most important factor when considering the level of economic activity and business cycle. The 3 major divisions of consumer behavior are (1) durable goods, (2) non durable goods and (3) services. Comparing trends in the purchase of these items is crucial.

Beyond assessing the consumer expending, economists can also gauge future directions by analyzing measures of consumer confidence and sentiment.

Growth in income is typically the best indicator in consumption prospects, specially disposable income. Savings rate is also a key factor because they can capture consumers intent to reduce saving or consumer preoccupation in saving for a rainy day.

Housing Sector Behavior

This sector includes new and existing home sales, residential construction activity and inventory of unsold homes in the market. This sector is specially vulnerable to interest rates because home buyers finance their purchases with mortgage loans. Besides interest rates, housing prices also depend on the average income of households. When housing prices are low relative to average incomes and mortgage rates are low, the cost of owning a house falls and demand increases (cost of owning a house = cost of financing + cost of property).

Commonly, the housing prices and mortgage rates rise disproportionately in expansionary cycles, bringing on an increase

in relative house costs, slowing demand. This slowdown, in turn, may result in a cyclical downturn, first in demand for new houses and then in increasing unsold houses inventory.
Hot housing markets do not move home owners alone but they also bring in investments which are looking to profit from speculating an increase in house price.

External Trade Sector Behavior

The external trade sector varies tremendously in size and importance from economy to economy. Some economies rely on external trade, either to guarantee production factors (importing) or selling its products (through exporting). As result, some economies are more dependent on foreign markets and global economy than others.
Imports tend to rise with the pace of domestic GDP growth, as needs and wants generally increase the purchase of goods from abroad. Exports not only depend on the domestic country but on the rest of the world. If external forces are stronger, even if domestic economy is experiencing a decline in demand, the exports will grow as foreign forces offset domestic forces. Currency also plays a strong independent factor moving trade balances in different directions.

2. Theories of the Business Cycle

2.1 Overview

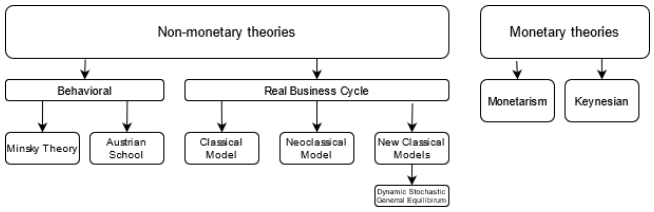

Figure 4. Overview of economical theories

Real Business Cycle Theory

Real Business-Cycle Theory (RBC) is a class of new classical macroeconomics models in which business cycle fluctuations are accounter for by real shocks (in contrast to nominal shocks).
If assuming in a recession government will give low rate loans and subsidies to corporations that want to invest, why would any reasonable company invest substantially outside recessions unless absolutely required to?
If most companies think of that, they will stop investing and therefore causing a recession. In theory, the government anticyclical policy could cause recessions.
Real Business Cycle models (RBC) are models that do not include money. Instead, cycles have real causes such as demographics, wars, technology changes, whereas monetary variables such as inflation are left out of the equation and are assumed to have no effect on GDP and unemployment.
Critics of RBC often focus on the labor market. Because RBC rely on efficient markets, it follows that unemployment can only be short term apart from frictional unemployment. Then, if markets are efficient, a person who doesn't have a job can only be a person that doesn't want to work because with the assumption of efficient markets, in order to find work a person just needs to lower and adjust his wage rate until he finds and employer to hire him.

Real Business Cycle Framework

Real business cycle models view aggregate economic variables as the outcomes of decisions made by many individual agents acting to maximize their utility subject to production possibilities and resource constraints - RBC models have explicit and firm foundations in microeconomics.

How do rational maximizing individuals respond over time to changes in the economic environment?

What implications do those responses of economical agents have for the equilibrium outcomes of aggregate variables?

Classical economics

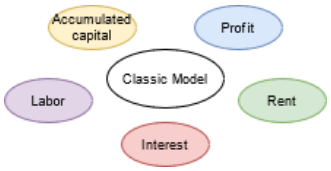

Figure 5. Overview of the classical economic model

The beginning of the economic classicism is market by the conceptions of *Adam Smith*, who reorients the economy focus from the protection of self interest towards the support of an entire nation's interest. The first premise is that price, wage and interest rate flexibility creates the conditions of economic equilibrium.
It emphasizes free economy and the self-regulating capabilities of markets providing economic stability without exogenous interventions (state only intervenes to help ensure safety and free flow of trade). The thinking system is mostly dominated by perfect competition, without protectionism or restrictions and where other forms of competition such as oligopoly and monopolies (unfair competition and market imperfections) exists but are limited.
Full employment is the key element of pure classicism and is deemed as the condition of a freely functioning economy. Even when in disequilibrium with unemployment levels off the natural state, the equilibrium is reestablished through changes in wages. The equilibrium is the very result of inequalities between savings (interest), labor (wages) and capital (prices). Each one of those endogenous variables is interdependent and self regulated through feedback and feedforward loops. If investments lower in weight of household income/expenditure, the demand for money decreases and interest rates readjust by lowering, thus incentivizing new potential investors and investments.

Classical thinkers

- Adam Smith
- Thomas Robert Malthus
- David Ricardo
- Jean-Baptiste Say
- John Stuart Mill

Neoclassical Schools

The neoclassical model relies on the concept of general equilibrium and assumes that all markets will eventually reach equilibrium because of the "invisible hand, or free market". All resources are used efficiently based on the rule that marginal cost equals marginal revenue (profit maximization).
So, in theory, if a shock does occur, any shift in aggregate demand or supply will quickly readjust its equilibrium by reducing output, price levels and lower interest rates.
The neoclassical school does not have a theory of the business cycle and thus doesn't recognize wide economical fluctuations such as the great depression.
According to the classical economists, money does not exert influences on the real economy. There is a dichotomy between the real factors of the economy such as production level, employment and consumption and nominal factors such as price levels of wages, exchange rates and money. Because of that, money supply would be transposed into generalized increase in price levels instead of production surplus.

Say's law Say argued that economic agents offer goods and services for sale so that they can spend the money they expect to obtain. Essentially, the quantity and quality of goods and services that is offered is evidence of an equal quantity individuals are expected to demand, stating that money is just a medium between the goods provided and received - **"supply creates its own demand"**.

Neoclassical Framework

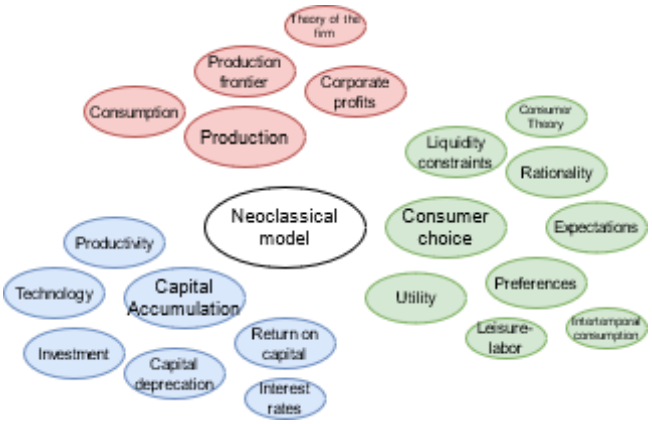

Figure 6. Overview of the Neoclassical Framework

The Neoclassical model considers an economy populated by many identical agents (households) that live forever. The utility of each agent is some function between consumption and leisure they expect to enjoy over their lives. Each agent has access to a commodity with constant returns to scale (fixed investment). The production function requires capital, which depreciates overtime and labor. The production technology is assumed to by positive slopped but with temporary productivity shifts or technological changes, providing the underlying source of variation to the economical environment to which agents must respond.
Consumers are thus faced between the decision on how to allocate their resources:

- **Time** - allocating their time between work and leisure subject to their time constraints in order to maximize lifetime utility
- **Money** - allocating efficiently their money between investment and future capital (fixed investment) and current consumption

The model imposes some natural constraints such as a minimum leisure for necessary activities, a limited capital constraint so that investment and consumption is less or equal to labor compensation.

Variables of the model:

- Preferences & Choice
- Production
- Capital Accumulation
- Resource and liquidity constraints
- Utility Maximization
- Profit Maximization

Despite its simplicity, this model seeks to explain economical fluctuations with purely real variables, driven by technology and productivity disturbances. For that reason, the Neoclassical Model has been labeled a *real business cycle model*.

The New Classical School

The new classical macroeconomics builds its analysis entirely on neoclassical framework, specifically in the importance of micreconomics and rationality (rational expectations).
The **new classical macroeconomics** seeks an approach based on individuals maximizing utility on the basis of rational behaviors and companies maximizing profits. This is a generalized assumption as the solution considers the problem of one agent (the economy is composed of roughly alike agents). 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 instead of one.

Equilibrium

Is the economy equilibrium a result of the competitive equilibrium between prices and quantities?

Do these optimally chose quantities correspond to the per capita quantities that would be produced in competitive equilibrium involving many agents interacting in the market for current and future goods and labor? The Choice problem is to maximize a subjects lifetime utility subject to the production technology and a sequence of resource constraints, a problem that can be viewed as a constrained optimization problem. Given a specific functional forms of utility function and production function and some initial conditions, the problem evolves from these sets of decision rules and relationships - these equations relating the evolution of the system are *differential equations of state*.

These decisions, for instance, relate to the amount of total output via the production function by assuring the optimum quantity of labor to provide (via real wage prices), interest rates (one period loans) and consumption levels.

Another important characteristic is that these models tend to converge to constant or steady state values.

Monetarist School

Monetarist School (Milton Friedman) objected Keynesian intervention for four main reasons:

- The Keynesian model does not recognize the importance of managing money. If money grows to fast, unsustainable growth occurs, if it grows to slowly, recession follows. A stable growth in money supply removes uncertainty.
- The Keynesian model lacks a complete representation of utility maximizing agents
- Keynes short term view fails to consider long-term costs of government intervention (increasingly high government debt and funding costs)
- Timing of governments economic policy responses is uncertain. Wrong timing can cause more harm than good.

Monetarist school realizes government action is sometimes required but advocate for limited intervention in favor of letting market find their own equilibrium. According to it, government intervention may cause cyclical fluctuations. Variations in the money supply can have major influences on aggregate output and income in the short run and on price levels in the long run.

2.1.1 Key authors:

- Milton Friedman
- John Maynard Keynes

Keynesian and Monetarist Schools

The Neoclassical and Austrian schools argue in free market and that no government intervention is needed. Unemployment and excess supply of goods will be solved by allowing market prices to decrease until demand equals supply and factors of production are once again fully employed.

Keynes, however, posed that while that is true, a generalized price and wage reduction reduces firm incentives of spending and investing as profits shrink and wage reduction depress household spending further aggravating the issue - a negative feedback loop.

For that reason, more than lowering interest rates, Keynes advocated in government intervention and increase in autonomous spending to reignite growth. While markets are sure to reach an equilibrium, government intervention would be a catalyst in order to avoid excessive suffering while waiting for the economy to recover - *"in the long run, we are all dead"*.

Keynesian critics

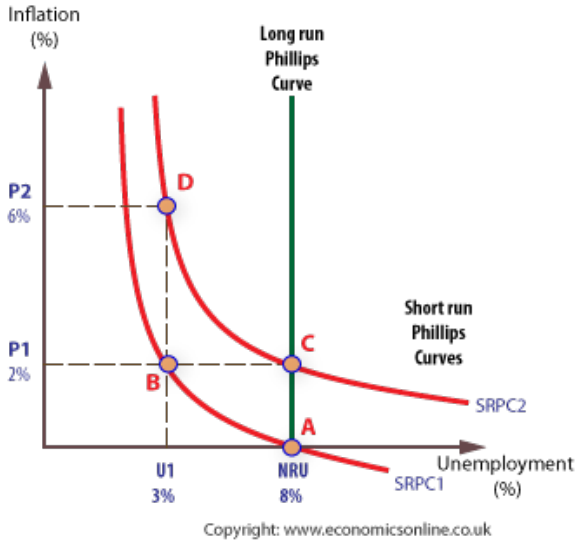

Figure 7. Phillips curve and long-run Phillips curve

A central feature of Keynesian system was the tradeoff between inflation and some measure of real output or unemployment. Friedman argued that basic microeconomics principles demanded that the long run Phillips curve must be vertical at the **natural rate of unemployment (NRU)**.

Why? Because, for instance, governments have no further incentives to change monetary policies because employment is at the long-term equilibrium level and there is no *money illusion* in the long-run because both workers and firms can adapt to expected inflation so that it doesn't erode their nominal wages and profits.

This is the very important assumption of homogeneity of degree zero in nominal prices and money income when individuals maximize their utility and firms maximize their profit

in the long-run.
Robert Lucas emphasized this point by arguing that microeconomics foundations frequently implied behavioral questions which weren't exploited by the Keynesian model such as the importance of expectations about future policies and future conditions which will systematically influence current decisions.

Some criticism to Keynes:

- Fiscal deficits mean higher government debt, increasing the danger that government finances could move out of control and create a massive crisis.
- Keynesian policies are focused on the short term. In the long term, this additional effect from government intervention and expansionary policies may cause it to *overheat* (unsustainable growth), causing a lot of side problems.
- Fiscal policies take time to develop and implement and for that reason fiscal policies tend to lag the economy.

Austrian Schools

Austrian school focus in the roles of interest rates and the resulting excessive credit growth. Business fluctuations result from a boom-and-bust; that is, the investment levels are the sole reasons of business cycles as companies over-invest in project with low returns in periods of credit expansion, eventually failing in periods of credit tightening and increased interest rates. Companies that accumulate too much production capacity will suddenly stop to reinvest, depressing aggregate economy.
In short, Austrian school sees business cycles as arising from the cyclic over-investment failures.

Austrian Schools Framework

In opposition to other schools of economics, Austrian Schools focus on the subjective choices of individuals including individual knowledge, time, expectations and ambitions. Its an individualist approach opposed to the focus on the aggregate variables.
The *methodological individualism* is the method that seeks to explain economic phenomena, by analyzing the actions (or inactions) of individuals because groups or collective individuals cannot act except through the actions of individual members.
This theory emphasizes the subjectivity of tastes and preferences which ultimately determine valuations and demand for goods. It procures to explain such discrepancy in the value of goods and services through *marginalism* by considering that "the reason why the price of diamonds is higher than that of water is that diamonds owe a greater additional satisfaction over what". In short, what matters isn't the total utility of an item but the marginal utility.

Minsk Model

The Minsky model attributes economical turnovers to behavioral finance. It describes how excesses and complacency makes people underestimate risk of events that have not occurred in a while. This is mostly due to the "irrational exuberance" behavior happening when cognition biases such as overconfidence and short memory induce investors to sub-optimal choices. Eventually, these sub-optimal choices require correction from the markets creating periods of panic and economical downturn.
The Minsky moment is the point in a business cycle when, after individuals have become overextended in borrowing to finance speculative investments, people start realizing the something is likely to go wrong and panic ensues. Investors more-often chose to ignore risk after a long period of economical growth, because they believe that this good phase will continue indefinitely. Likewise, they often ignore tail risks by misjudging the probability of such hazardous event to happen.

Neo-Keynesian model

Dynamic stochastic general equilibrium

3. Unemployment and Inflation

Both unemployment and inflation are strong incentives for economic policies from central banks related to limiting or easing the rate at which citizens are unemployed and containing inflation (preserving domestic purchasing power).

Unemployment

An overheated economy leads to inflation when unemployment is very low. When unemployment is beyond the optimal level, workers are more prone to ask for raises because there is a shift in labor market causing scarcity and firms still need to operate. This drives firms to increase prices in advance, further aggravating the issue as workers demand again for higher wages because they expect prices of goods and services to go up. While employees have market power in bidding over employers, wages will tend to rise and thus the price of goods and inflation kicks in.
A key aspect in this process is inflation expectations, either **consumer inflation expectations** of final goods and **producer inflation expectations** regarding raw materials and production inputs.
Definitions used in labor market:

- **Employed**: number of people with jobs
- **Labor Force**: number of people who either have a job or actively looking for a job. It excluded retirees and children (people whose age is outside the work force), stay at home parents (home workers), full time students and other category of people who are neither employed nor actively seeking employment.
- **Unemployed**: people who are actively looking for jobs but currently without one. Unemployed includes some special subcategories:
- **Long-term unemployed**: People who have been out of work for a long time (more than 3 or 4 months, depending on the country) but that are still looking for a job
- **Fictionally unemployed**: People who are not working at the time of the statistical survey because they are taking time to search for jobs that match their preferences better. Frictional unemployed includes people who have voluntarily left their jobs, in opposition to unemployed who lost their jobs for exogenous factors. Fractionally unemployed are said to be *"in between jobs"*.
- **Unemployment rate**: ratio of unemployed to labor force
- **Activity ratio** (participation ratio): Ratio of labor force to total population of working age
- **Underemployed**: Person who has a job but has over qualifications.
- **Discouraged worker**: person who has stopped looking for a job. Discouraged workers are outside of labor force and therefore do not count to unemployment rate (hidden unemployment)
- **Voluntarily unemployed**: person voluntarily outside of the labor force, refusing an available vacancy because the wage is lower than their threshold.

Unemployment rate as a lagging indicator

Unemployment rates are carefully studied by governmental agencies and is undoubtedly an important and insightful indicator towards economic well being. However, they are inaccurate in pointing to cyclical directions because (1) labor force is reactionary: labor force and employments change in response to economic stimulus and (2) unemployment is delayed as companies usually prefer to extend overworking hours than hiring and prefer to reduce working hours and cut wages to avoid laying off people. When unemployment rises, companies are already past the short term adjustment phase and are actively looking to shrink (expand) production.
That being said, unemployment rate is a **lagging indicator**.

Indirect measures of unemployment: payroll employment and productivity

Two additional measures of labor intensity are (a) the number of hours worked and (b) the use of temporary workers. The first expenses managers are likely to cut are the expendable ones. That is, its easier to cut a few hours to everyone than to layoff one person, so the first reaction is to cut back overtime. Such movements are often reactionary measures to small shifts month-over-month. Similarly, in an upswing managers are looking into increasing overtime.
Productivity measures the rate of output per input. Considering the productivity of labor, such insights may provide helpful in identifying downturns as companies might want to hold existing labor force as the decrease in profit from lower productivity doesn't' justify the costs of layoff plus rehiring eventually.

3.1 Inflation

Inflation refers to a sustained rise in the overall level of prices in an economy. Inflation rate is the percentage change in a price index - the speed of overall price level movements.

- **Deflation**: a sustained decrease in aggregate price level (negative inflation rate)
- **Hyperinflation**: extremely fast increase in aggregate price level such as 200, 500% increase per year.
- **Disinflation**: decline in the inflation rate, such as from 15% to 6%. It is similar than deflation but even after a period of disinflation the inflation rate remains positive.

3.2 Measuring inflation through price indexes

Price indexes represent the average prices of a broad bask of goods and services. The base period is usually set to 100 (the base period is the period of comparison).
The **laspeyres index** holds the composition of the consumption basked constant. This has some serious biases such as:

- *Substitution bias*: as price of goods rise heterogeneously, people might substitute some goods with others with lower prices.
- *Quality bias*: as quality of items improve overtime, people become increasingly demanding for quality in durable items (mostly). If the index isn't adjusted for quality changes, the measured inflation will experience a upward bias (the quality adjustments for quality are called hedonic pricing or hedonic adjustments)
- *New product bias*: new products are frequently introduced and fixed basked of goods tend not to include those items. It creates another issue, generally a upward inflation bias as well.

Some other indexes which aim to solver these biases are **Fisher index** and **Paasche index**.

Consumer price indexes

The **consumer price index** (CPI) covers only urban areas in the united states, hence being called **CPI-U**. On the other hand, **personal consumption expenditures** (PCE) covers all personal consumption.
The **producer price index** (PPI) is another important measure of inflation. The PPI reflects the price change experienced by domestic producers. Fluctuations in PPI are eventually passed on consumers and can influence future CPI. In some countries, PPI is called **wholesale price index** (WPI).
On a side note there are securities such as United States Treasury Inflation Protected Securities (TIPS) which adjust the bonds principal according to the US CPI-U index, although the terms of other contracts such as leases or payments may also be periodically adjusted according CPI.
Central banks use consumer price index to monitor inflation. The European Central Bank (ECB) focused on the **Harmonised Index of Consumer Prices** (HICP). Each member of the EU reports its own value of the HICP and then Eurostat aggregates the country values with corresponding weights.
Headline inflation refers to the inflation rate calculated based on the price index of all goods and services in an economy. The **core inflation** usually refers to inflation rate calculated based on the price index of goods and services except food and energy. Policymakers often chose to focus on the core inflation rate.

3.3 Types of inflation

There are essentially two types of inflation: **cost-push inflation** reflects the rising costs of production inputs such as wages or natural resources, the **demand-pull inflation** occurs when demand increase disproportionately and outpaces supply, which increases costs.

- **Cost-push inflation** The commodity prices are proxies of such inflation because commodities are an input to production. However, more than commodities, wages are the biggest factor in every business cost structure (most of businesses at least). For that reason, its important to gauge price levels of commodities and well as wage and unemployment rates. Specifically shortages in labor market can easily drive up wages and cause cost-push inflation. Milton Friedman draw a relation between the inflation rate and unemployment rate stating that unemployment rate when below a certain level creates pressure on labor markets driving up inflation - this level is referred as **non-accelerating inflation rate of unemployment** (NAIRU). This is the nobel prize winners work on the **natural rate of unemployment** (NARU).

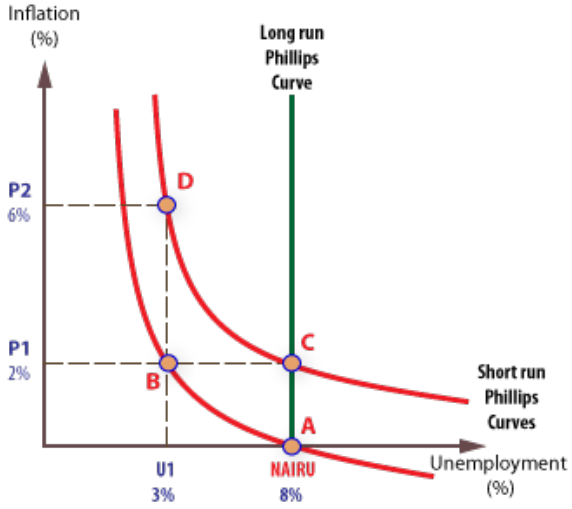

Figure 8. NAIRU representation on the Phillips curve (new Keynesian model)

A particular example of this happened in the technology sector. It is so new and it has grown so rapidly that in some economies training labor force cannot keep up with demand. This particular sector faced shortages of trained workers and wage pressures despite not having a direct impact in economies as a whole and the overall labor market.
Tied to wages is productivity, inherently. Productivity is a long term essential source of wage-push inflation because the higher the productivity of labor is, the faster labor compensation can expand without putting undue pressure on businesses costs and profits.

- **Demand-pull inflation** The demand pull side of the inflation is directly tied to potential GDP and actual GDP relationship and industrial capacity utilitization. The higher the rate of capacity utilization or the closer GDP is to potential GDP, the more likely it is for the economy to suffer shortages, bottlenecks and generally miss out on the ability to satisfy demand, increasing prices. The lower an economy operates below potential GDP, the less pressure there is over supply.

4. Economic Indicators

Figure 9. Components of economic well being

- **Leading Economic Indicators**: economic variables with turning points preceding the overall economy
- **Coincident Economic Indicators**: have turning points that are usually close to those in the overall economy
- **Lagging Indicators**: have turning points that take place later than economic activity shifts

In the USA the composite leading indicator is known as the Index of **Leading Economic Indicators** (LEI). LEI has 10 components ranging from orders of capital goods, consumer expectations and stock prices.
Similar statistics exist for numerous economies. The Conferance Board computes leading, lagging and coincident indicators for USA and 9 other countries plus Eurozone. The OECD calculate the **Composite Leading Indicators** (CLI) for the Eurozone and G-7. The Economic Cycle Research Institute (ECRI) also computes leading indicator indexes weekly.

Eurozone leading index:

- Economic Sentiment Index
- Residential Building Permits
- Capital Goods Orders
- The Euro Stoxx Equity Index
- M2 money supply
- Interest rate spread
- Eurozone Manufacturing Purchasing Managers Index
- Eurozone Service Sector Future Business Activity Expectations Index

Japans leading index:

- New order for machinery and construction equipment
- Real operating profits

- Overtime worked
- Dwelling units started
- Six month growth rate in labor productivity
- Business failures
- Business Confidence (Tankan Survey)
- Stock prices
- Real M2 money supply
- Interest rate spread

5. Learning Objectives

Describe the business cycle and its phases

The business cycle is characterized by fluctuations in short term economic activity and has four phases: expansion, peak, contraction (or recession) and trough.

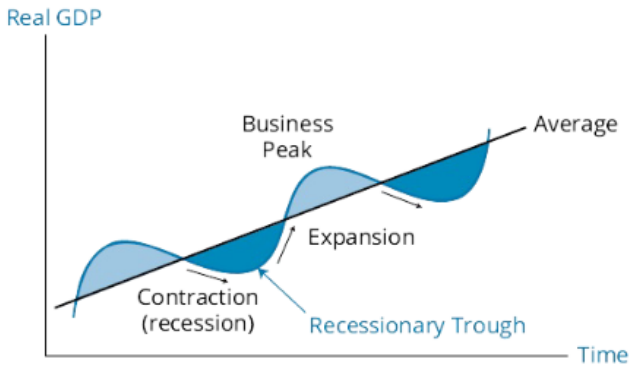

Figure 10. Representation of a Business Cycle

Why do they happen?

Business cycles exist for as long as primitive economies exist. The first agrarian societies were prone to business cycles when their harvest yields varied due to exogenous conditions, such as weather, soil degradation, plant and animal diseases, among other factors. Modern economies are less reliant on such exogenous effects but they still persist throughout economic growth in the long-run.
Essentially, business cycles derive from fluctuations in either demand, supply or both resulting a different equilibrium. These fluctuations generate disequilibrium and unbalance in the overall economies implying that the actual GDP (GDP_R) isn't at the potential GDP (GDP_P) level:

- ($GDP_R < GDP_P$) and thus experiencing a recession
- ($GDP_R > GDP_P$) and thus experiencing an expansion

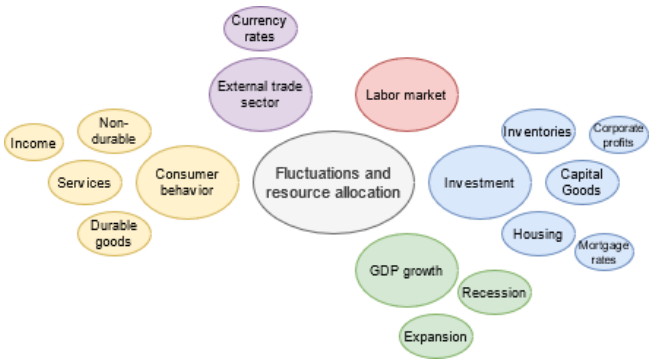

Figure 11. Factors of the Business Cycle

Early Expansion (Recovery)

In the beginning of the expansion phase, companies will gradually increase their existing workforce and production capacity until they are sure that economy is indeed recovering strongly. Layoffs slow down but hiring still remains high, as businesses turn to overtime and temporary employees before committing to more aggressive expansion. Consumer and business spending picks up, as companies order new production stock (mostly light equipment) and consumers increase spending in non essential and durable goods and housing.
The economic activity picks up and stabilizes until it starts to grow slowly. During this time, counter cyclical measures by the central banks and governments start to be gradually phased out (tapering).

Late Expansion

After the recovery phase, economy has a strong positive outlook and hiring and overtime increases, reducing the unemployment rate. The consumer spending increases and business begin to invest in heavy equipment and plants. As result, accelerating rate of growth ensures and inflation follows. Unemployment sharply decreases and overtime hours increase.

Peak

The peak occurs when activity levels start to subside and economy to weaken as businesses slow hiring and consumers reduce expenditures. The growth of spending lags behind the growth of capital investment from firms.

Contraction (Recession)

Economical output and demand decline and businesses are the first movers to cut all expansion expenditures, decreasing most industrial production, housing and durable goods. They cut hours and start freezing hiring followed by layoffs, increasing the unemployment rate. Consumers reduce consumption as well.

Trough

Summary

	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.

Figure 12. Summary of the characteristics of Business Cycles

Describe how resource use and sector activities vary as economies move through business cycles

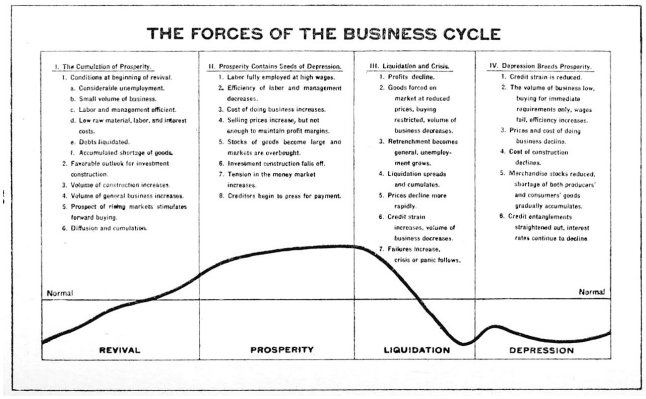

Figure 13. Forces of the business cycle

Describe types of unemployment and compare measures of unemployment

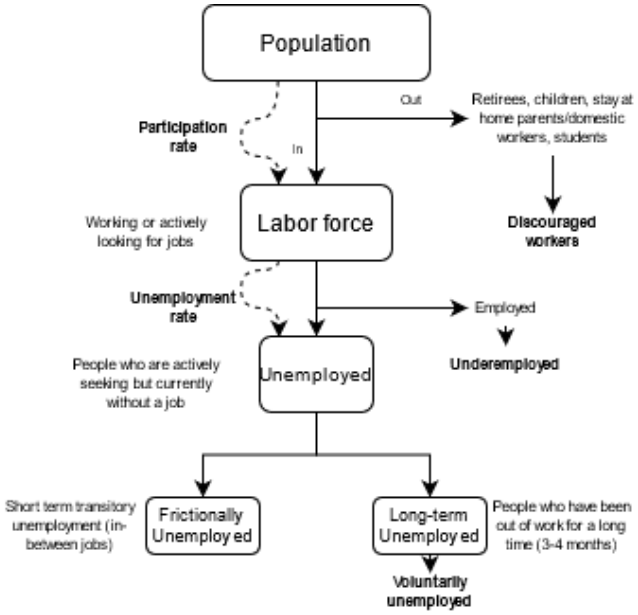

Figure 14. Employment

Cyclical unemployment

Cyclical unemployment (or Keynesian unemployment) is derived from recessions during economic fluctuations when there is not enough aggregate demand to provide jobs for everyone who wants to work. Demand for most goods and services falls and less production is needed, wages are sticky so do not adapt to the new equilibrium and unemployment results.

Workers > *Vacancies*

Okun's law is an empirically observed relationship between unemployment and (losses in) GDP.

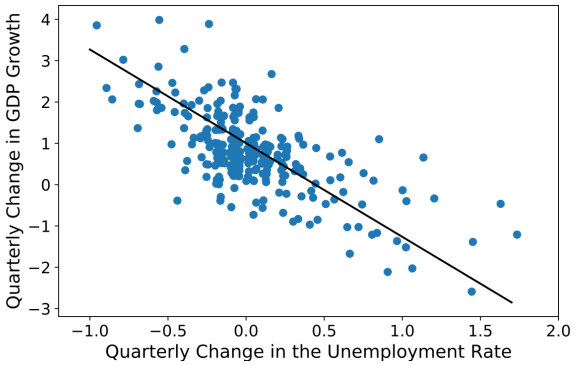

Figure 15. For every 1% increase in unemployment rate, there is a 2% decrease of potential GDP of the country GDP

Structural unemployment

It occurs when labor markets can't provide jobs for everyone because of mismatch between the skills of unemployed and the skills required for the vacate jobs.

Frictional unemployment

Frictional unemployment occurs because both jobs and workers are heterogeneous and a mismatch between demand and supply can occur. For that reason, either companies and individuals may take additional time to search for payment, work-time, locations (individuals), attitude, tastes, skills, motivation (companies), etc.
Both workers and employers accept a certain level of imperfection based on their requirements, but usually invest some risk and effort in finding a good match - in fact, this is good for the economy since it results in better allocation of resources.

Hidden unemployment

Unemployment statistics often underestimate unemployment rates because of how the statistics are collected (like the fact discouraged workers are out of the scope of labor force, it doesn't reflect domestic workers as employed, it reflects underemployed as any other employed, it does not consider full-time students as part of the labor force).

Explain the construction of indexes used to measure inflation

Price indexes represent the average prices of a broad basket of goods and are commonly associated with proxies of the dollar purchasing power of outputs or purchasing power - they are proxies of inflation and *cost of living* (COL)

Laspeyres index

The Laspeyres index is a price index which holds the composition of the consumption basket fixed throughout quarters. In some countries it is adjusted every 5 years. Because the index uses a fixed basket of goods it has three serious biases: (a) it doesn't account for *substitution*, as people can consume less expensive substitute goods when prices increase (b) it doesn't account for *quality or hedonic adjustments* which are also responsible for increased prices and (c) it doesn't include new products (*new product bias*)

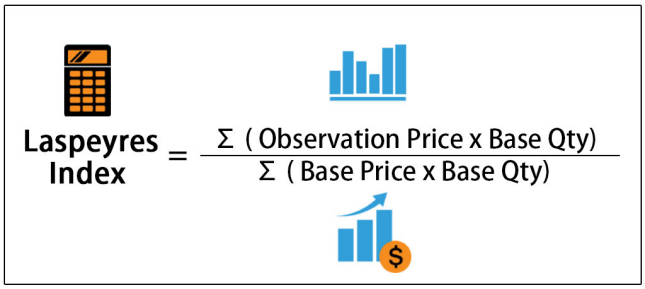

Figure 16. Laspeyres Index Formula

$$PaascheIndex = \frac{\sum P_n Q_0}{\sum P_0 Q_0} \tag{1}$$

Most price indexes are Laspeyres.

Paasche index

The Paasche index is the ratio between the prices of goods in time n and the prices of goods in time 0 considering the quantity of goods in time n. (Laspeyres uses quantities of time 0 as common denominator while Paasche uses time n)

$$PaascheIndex = \frac{\sum P_n Q_n}{\sum P_0 Q_n} \tag{2}$$

Fisher index

The Fisher Index is the geometric mean of the Paasche index and Laspeyres index. It consideres the common quantity denominator as the geometric mean of quantity 0 and quantity n.

$$FisherIndex = \frac{\sum P_n \frac{1}{2}(Q_n + Q_0)}{\sum P_n \frac{1}{2}(Q_n + Q_0)} \tag{3}$$

$$P_F = \sqrt{P_L + P_P} \tag{4}$$

Compare inflation measures, including their uses and limitations

There are different inflation indexes, with the most widely followed being the consumer price index (CPI) which is based on the pattenrs of a typical household. The GDP deflator, producer price index (PPI) and wholesale price index (WPI) are also widely used measures of inflations.

Appendices

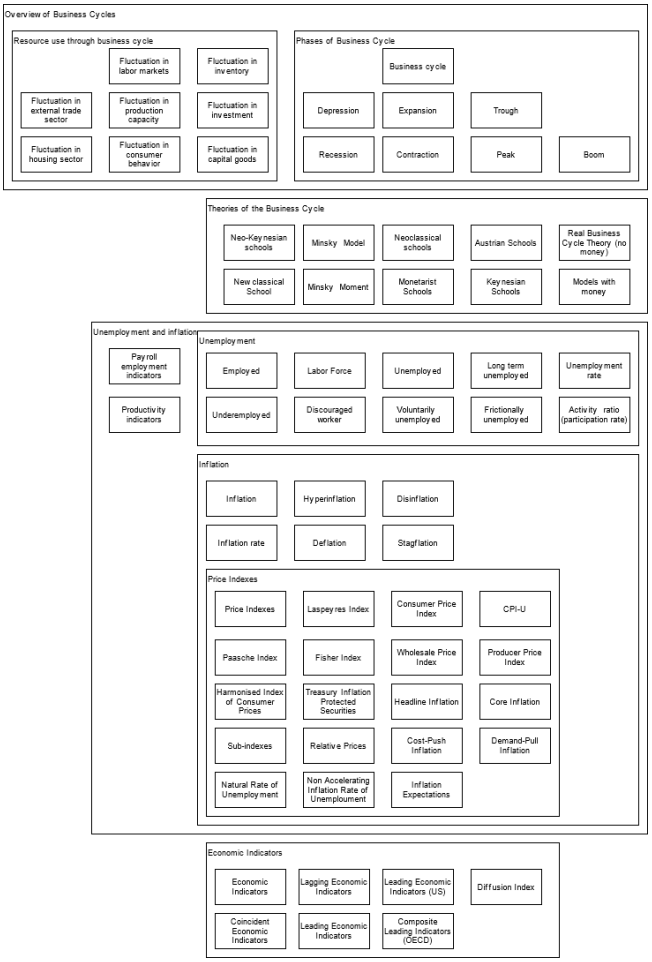

Figure 17. Summary of the characteristics of Business Cycles

References

[cfa, 2019] 2019. *CFA program curriculum*. CFA Institute.