Economics

Economic Growth
Session 1

National Association of Credit Management
Graduate School of Credit
and Financial Management
American University
Washington, DC
June 19, 2019

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Course Introduction

- Business Cycles
- Stocks
- Growth Economics
- Capital Formation
- Inventories
- Consumer Demand
- Leading Economic Indicators
- Statistics
  - Learn about the major economic statistics
  - How not to "lie" with statistics
  - How we can use these statistical indicators as a signal for the business cycle

What you will learn in this session

- The circular-flow diagram model
- How is the business cycle defined
- Five basic principles of the business cycle
- Life Cycle Hypothesis
- Efficient Market Hypothesis
- Stock market
- Growth Economics
- Gross Domestic Product
- Industrial Production
- Purchasing Managers' Index

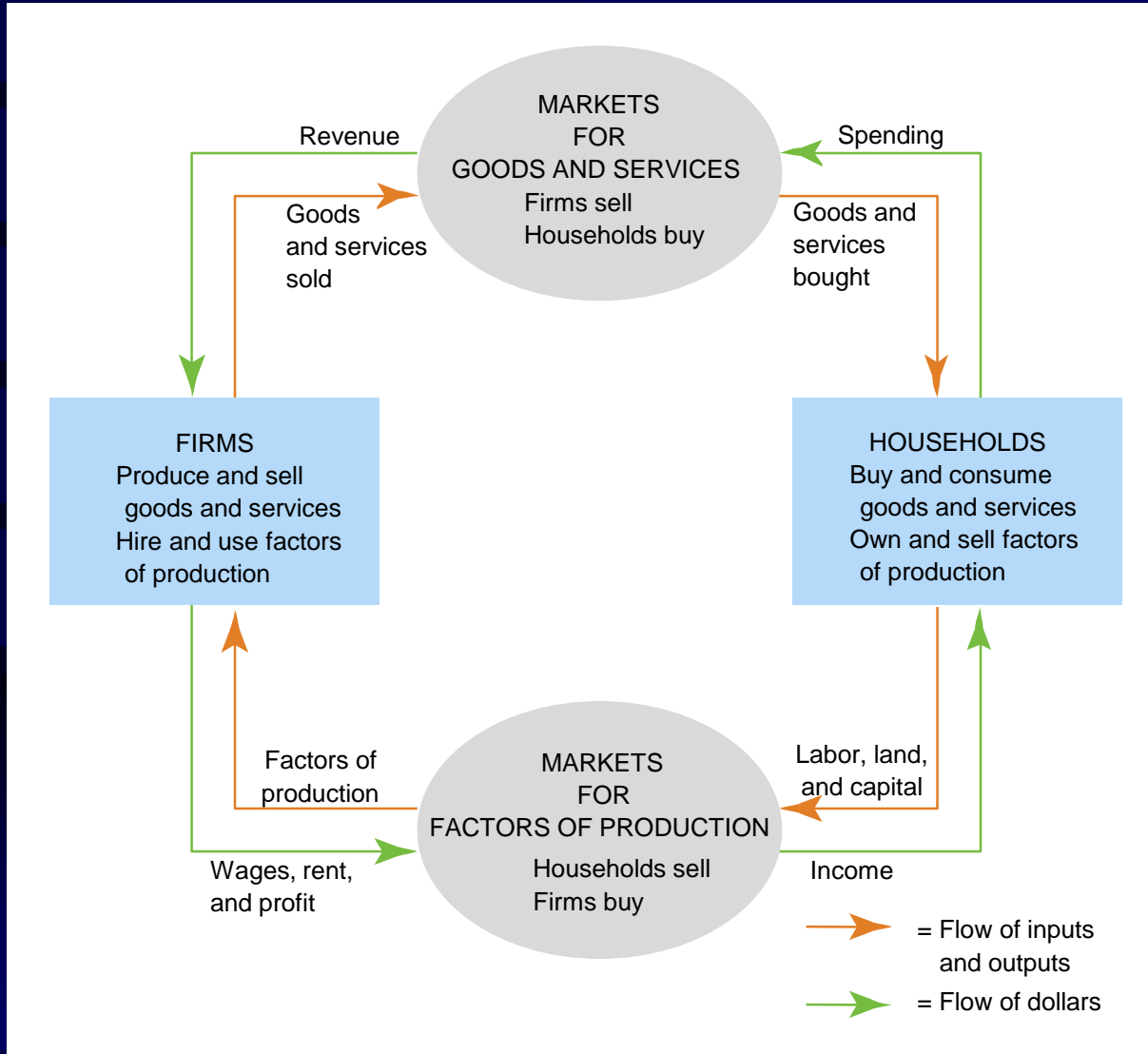Instructor: William Strauss, william.strauss@chi.frb.org – 312-322-8151

The Circular-Flow Diagram Model

- The circular-flow diagram is a visual model of the economy that shows how dollars flow through markets among firms and households

- Firms

  - Produce and sell goods and services

  - Hire and use factors of production

- Households

  - Buy and consume goods and services

  - Own and sell factors of production
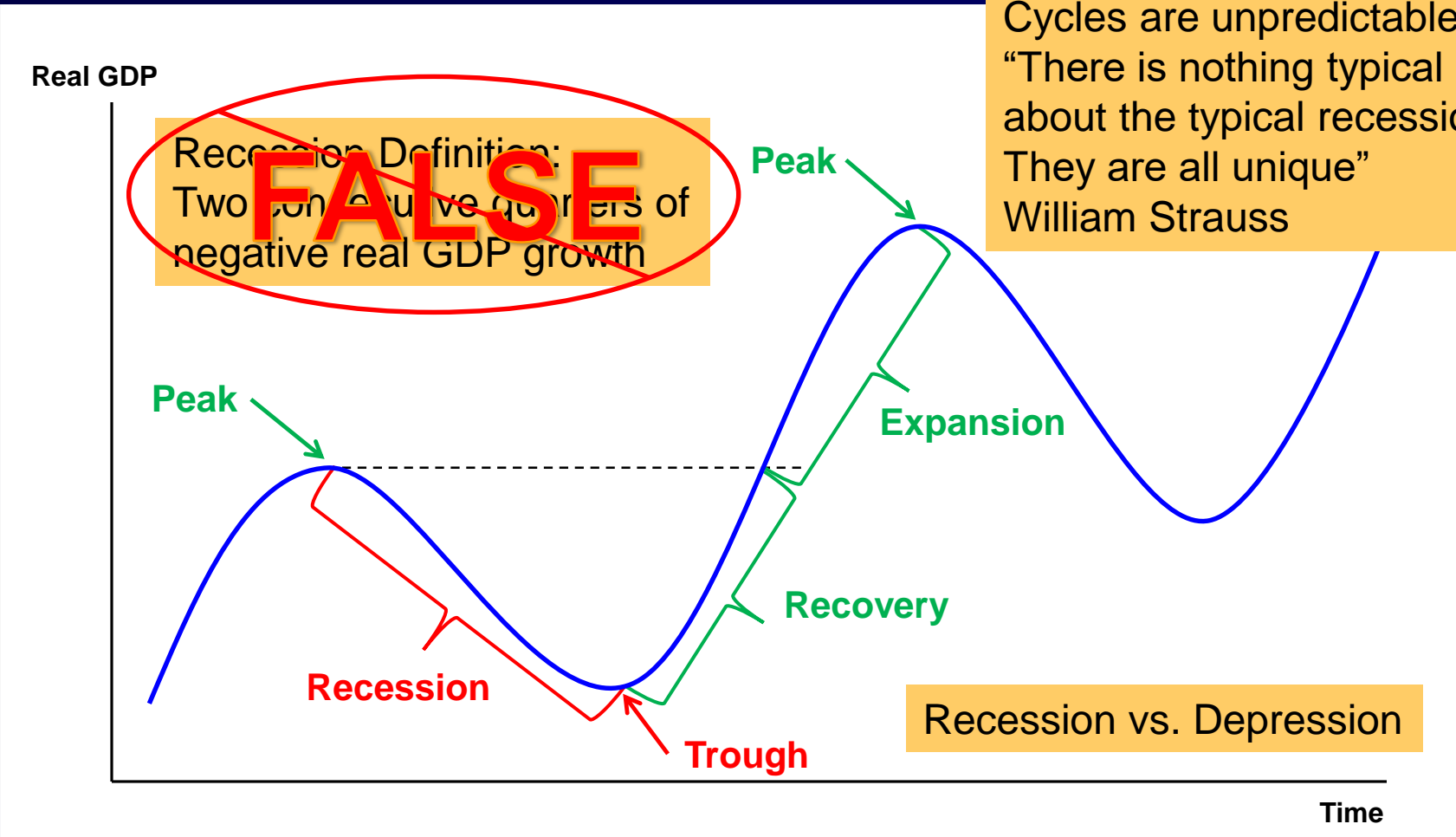
The Circular-Flow Diagram Model

- Markets for Goods and Services
  - Firms sell
  - Households buy
- Markets for Factors of Production
  - Households sell
  - Firms buy
- Factors of Production
  - Inputs used to produce goods and services
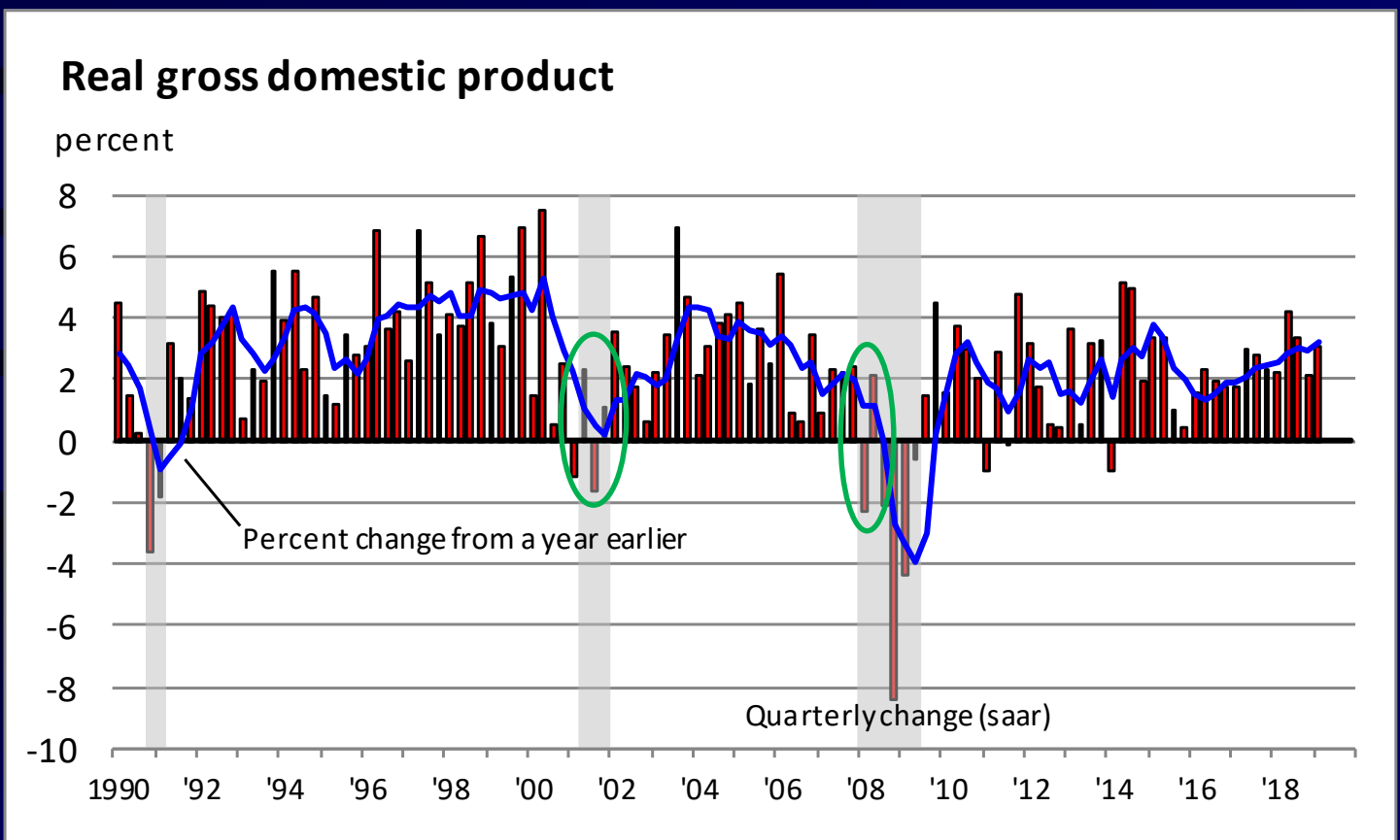 - Land, labor, and capital

The Circular Flow Diagram

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Business Cycle

Real GDP

Recession Definition:
Two consecutive quarters of negative real GDP growth

FALSE

Cycles are unpredictable:
"There is nothing typical about the typical recession. They are all unique"
William Strauss

Peak

Peak

Expansion

Recovery

Recession

Trough

Recession vs. Depression

Time

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Business Cycle

Real gross domestic product

percent

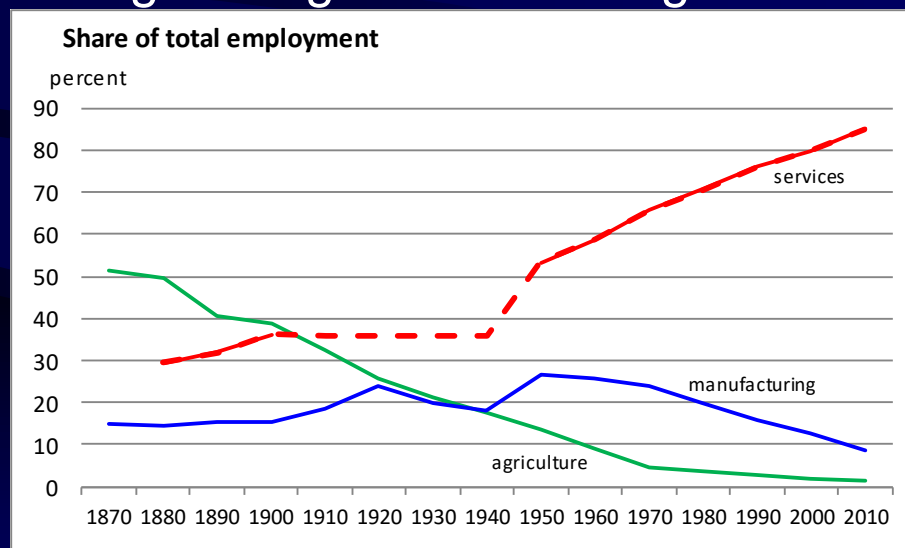Percent change from a year earlier

Quarterly change (saar)

The Business Cycle in the United States

- National Bureau of Economic Research (NBER)
- Definition:
  - During a recession, a significant decline in economic activity spreads across the economy and can last from a few months to more than a year
  - Similarly, during an expansion, economic activity rises substantially, spreads across the economy, and usually lasts for several years
  - The Committee does not have a fixed definition of economic activity. It examines and compares the behavior of various measures of broad activity: real GDP measured on the product and income sides, economy-wide employment, and real income. The Committee also may consider indicators that do not cover the entire economy, such as real sales and the Federal Reserve's index of industrial production (IP).

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Five Basic Principles of the Business Cycle

1) The forces of supply and demand condition every cycle
   – Increasing income requires an economy to increase production/output (supply) – produce more to earn more
   – The distribution of output has changed over time
     • Farming-Mining-Manufacturing

Share of total employment

percent

A line chart showing the share of total employment (percent, 0–90) from 1870 to 2010 for three sectors: services (red dashed then solid line, rising from ~30 in 1880 to ~85 in 2010), manufacturing (blue line, rising from ~15 to a peak of ~27 around 1950 then falling to ~9 in 2010), and agriculture (green line, falling from ~51 in 1870 to ~2 in 2010).

   – Demand must match supply or else prices will rise or fall

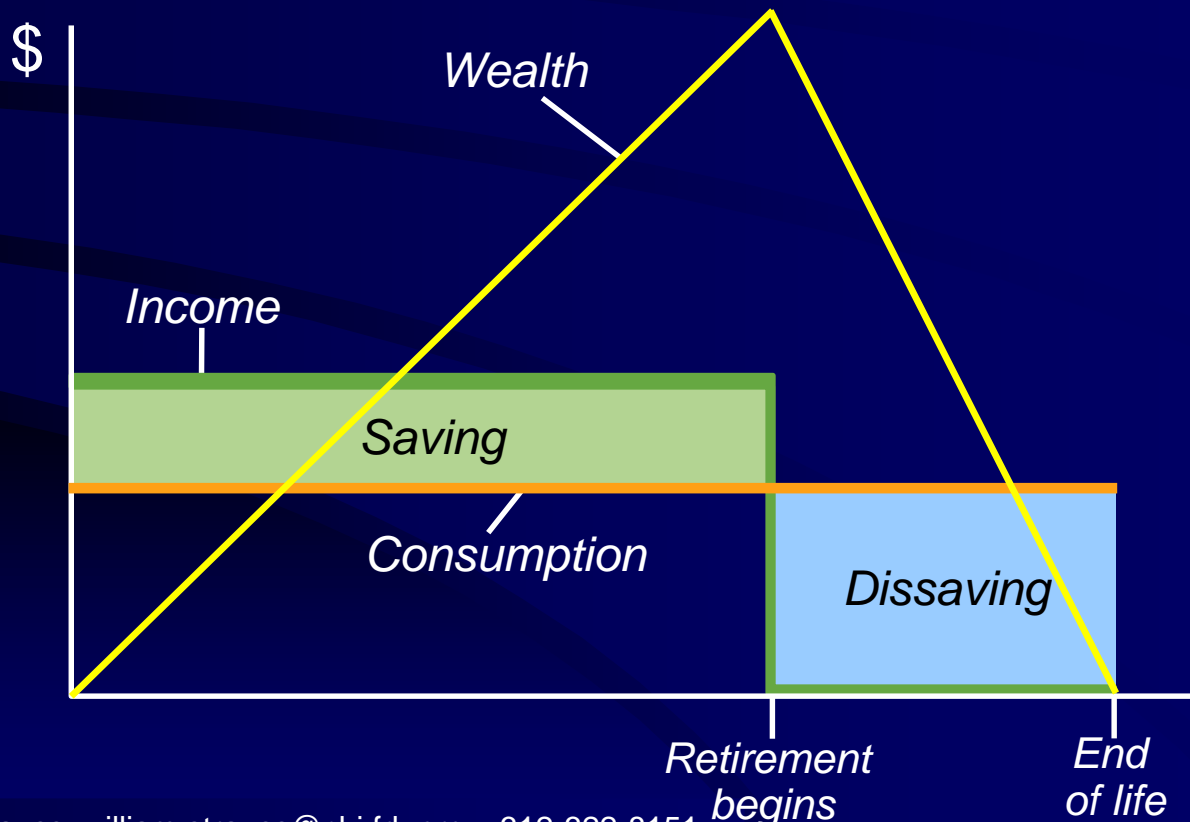Instructor: William Strauss, william.strauss@chi.frb.org – 312-322-8151

Five Basic Principles of the Business Cycle

2) Neither consumers nor businesses are constrained to rely solely on the income they have generated in the process of production

- Life Cycle Hypothesis (LCH)
  - Individuals base consumption on a constant percentage of their anticipated life income.
  - An example supporting the hypothesis is that people save for retirement while they are earning a regular income (rather than spending it all when it is earned).
  - Consumption smoothing

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Five Basic Principles of the Business Cycle

2) Neither consumers nor businesses are constrained to rely solely on the income they have generated in the process of production
   – Life Cycle Hypothesis (LCH)

The LCH implies that saving varies systematically over a person's lifetime.

$

Wealth

Income

Saving

Consumption

Dissaving

Retirement begins

End of life

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Five Basic Principles of the Business Cycle

2) Neither consumers nor businesses are constrained to rely solely on the income they have generated in the process of production

- Credit markets allow consumers and businesses to borrow and spend more than they earn
- Access to credit markets allows growth to occur, but as credit tightens growth becomes restrained

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Five Basic Principles of the Business Cycle

3) Every expansion carries with it the inevitability of "over-expansion," the creation of excess productive capacity and subsequent contraction

   a. Businesses that invest too heavily

   b. Consumers who borrow too heavily

   c. Shock that impacts either supply or demand exposes the over-expansion

      • Economic expansions do not "run out of steam"

Five Basic Principles of the Business Cycle

4) During contractions, production and income recede to a sustainable level; that is, they fall to a level not reliant on a continuous growth in credit

   a. The contraction returns the economy to a more efficient level of operation

   b. The contraction has a cleansing effect on the economy

      • Creative destruction - Joseph Schumpeter

5) Every contraction sows the seeds of the subsequent recovery

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Efficient Market Hypothesis

- Efficient Market Hypothesis
  - An investment theory that states it is impossible to "beat the market" because stock market efficiency causes existing share prices to always incorporate and reflect all relevant information.

> "It's part of what markets are so great at...you have all of these incredibly smart people and that's why markets are so efficient. Because on every side of the transaction you've got these good people doing it. There's somebody on the other side of that trade who is just as confident, just as optimistic...one of you is right and one of you is wrong"
> Stephen Levitt – CNBC interview May 29, 2014

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Stocks

- Stock market indexes
    - A stock index or stock market index is a measurement of the value of a section of the stock market
    - It is computed from the prices of selected stocks (typically a weighted average)
    - It is a tool used by investors and financial managers to describe the market, and to compare the return on specific investments
    - There are dozens of stock market indexes

Stocks

- Stock market index examples include:
  - Dow Jones Industrial Average (DJIA) - 30 large, publicly traded firms in the United States
  - Standard and Poor's 500 (S&P 500) - The 500 largest companies (based on market capitalization) included in the S&P and represents over 70% of the total market capitalization of all stocks traded in the U.S.
  - The Nasdaq Composite (Nasdaq) is a broad market index that encompasses about 4,0000 issues traded on the Nasdaq National Market--virtually every firm that trades on the exchange.
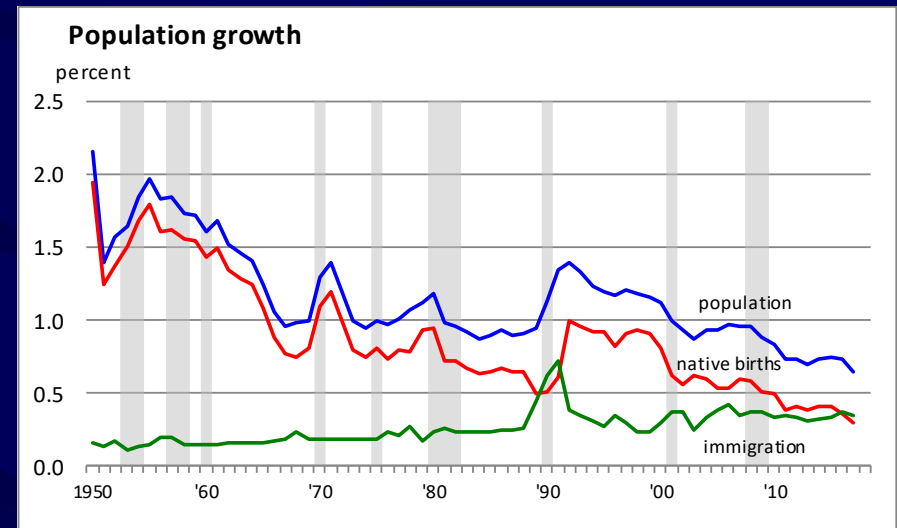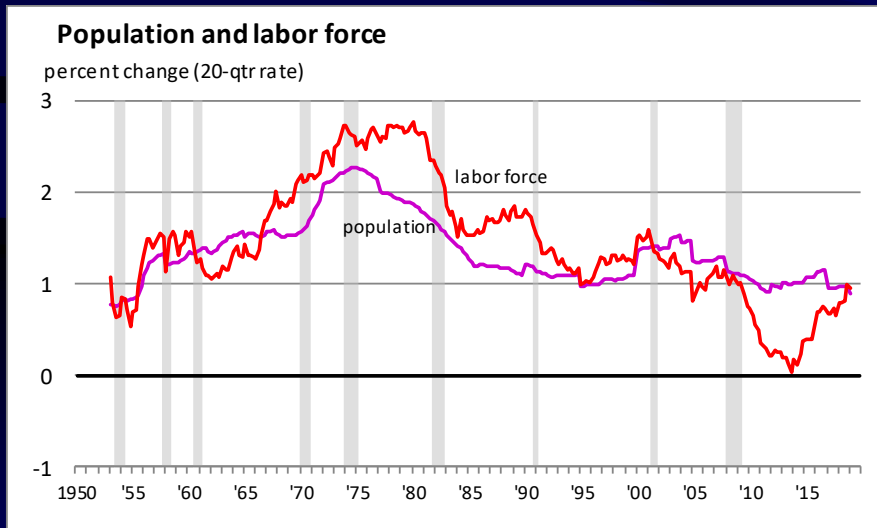
Stocks

- Nominal versus real
  - The stock market is a nominal indicator
    - Needs to be adjusted for inflation

S&P 500 stock index
Index: 1960=100

Real S&P 500 stock index
Index: 1960 = 100
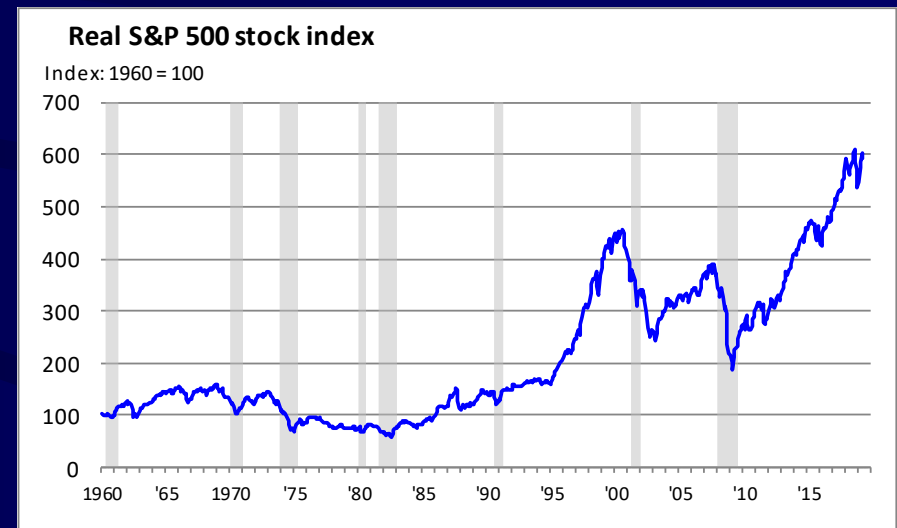
  - When is good news bad or bad news good?
    - Expectations

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Growth Economics

- There are only two ways that an economy can expand
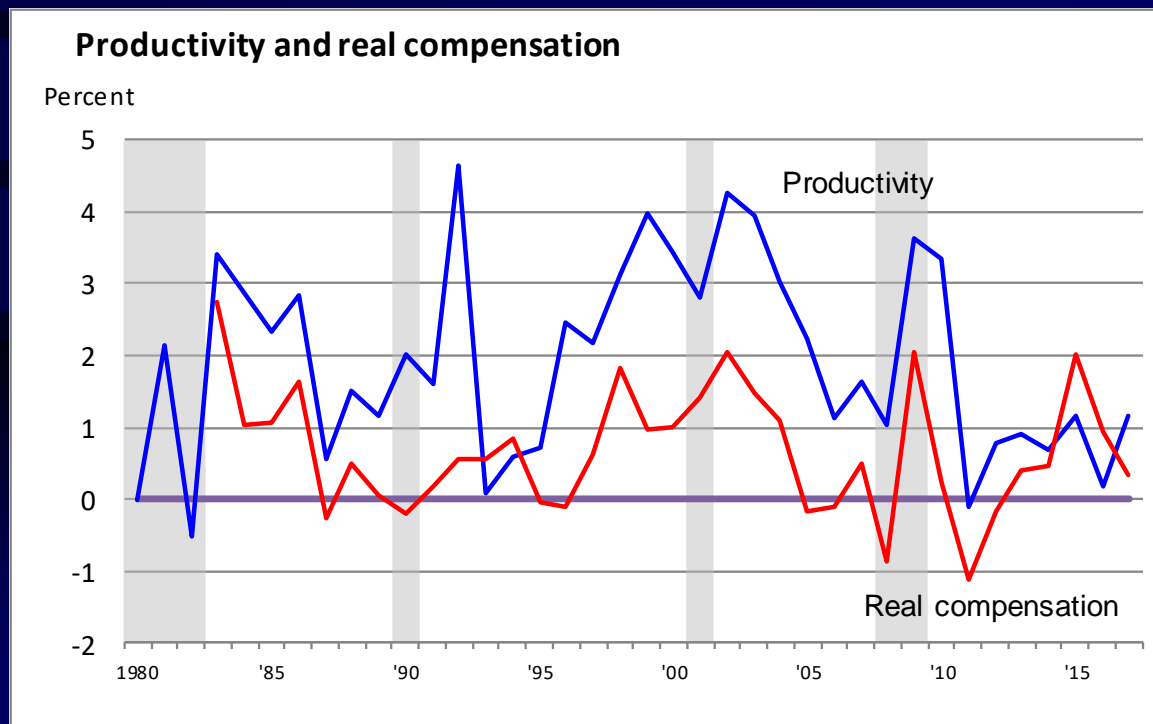 1) Labor force growth (population growth)
     - Births
     - Immigration

Population and labor force
percent change (20-qtr rate)

labor force
population

Population growth
percent

population
native births
immigration

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Growth Economics

- There are only two ways that an economy can expand
  2) Productivity growth
     - Productivity refers to the amount of goods and services produced for each hour of a worker's time
     - Factors that directly determine productivity:
       - Natural resources: land, raw materials, etc.
       - Physical capital: stock of equipment and structures that are used to produce goods and services
       - Human capital: knowledge and skills that workers acquire through education, training and experience
       - Technological knowledge: society's understanding of the best ways to produce goods and services

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Growth Economics

- There are only two ways that an economy can expand
  2) Productivity growth
     - A nation's standard of living is determined by the productivity of its workers

Productivity and real compensation

Percent

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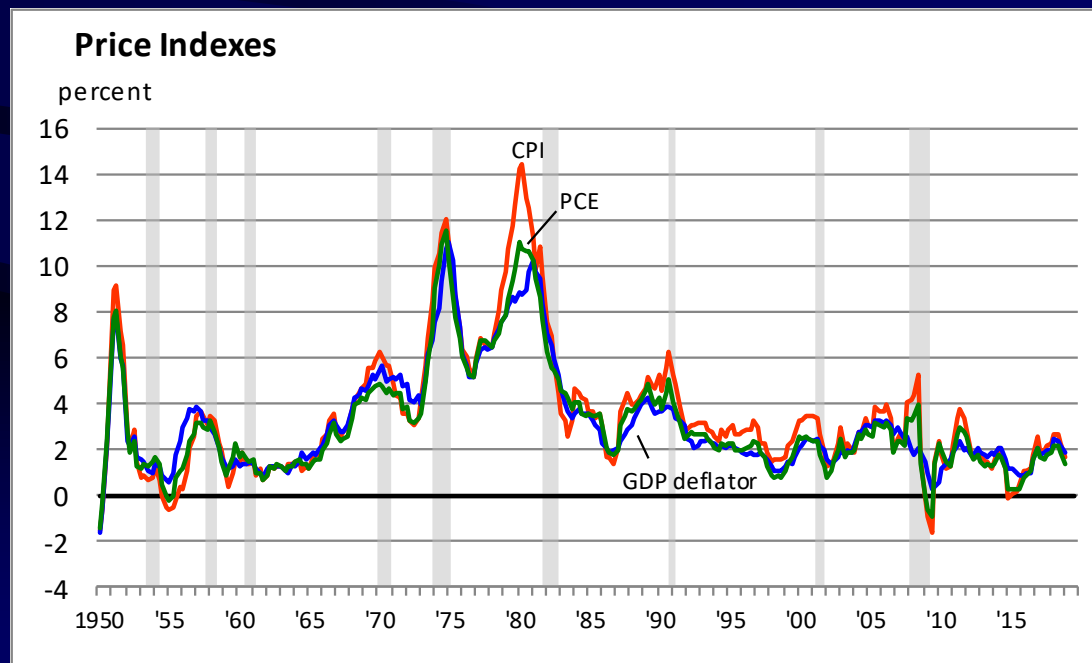
Gross Domestic Product

- **Gross domestic product (GDP)** is a measure of the income and expenditures of an economy

  - GDP is the market value of all final goods and services produced within a country in a given period of time

  - "GDP is the market value . . ."

    - Output is valued at market prices

  - ". . . of all final . . ."

    - It records only the value of final goods, not intermediate goods (the value is counted only once)

  - ". . . goods and services . . ."

    - It includes both tangible goods (food, clothing, cars) and intangible services (haircuts, housecleaning, doctor visits)

Gross Domestic Product

- Gross domestic product (GDP) is a measure of the income and expenditures of an economy
  - GDP is the market value of all final goods and services produced within a country in a given period of time

  - ". . . produced . . ."
    - It includes goods and services currently produced, not transactions involving goods produced in the past
  - ". . . within a country . . ."
    - It measures the value of production within the geographic confines of a country
  - ". . . in a given period of time"
    - It measures the value of production that takes place within a specific interval of time, usually a year or a quarter (three months)

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Gross Domestic Product

- Inflation
  - Inflation refers to a situation in which the economy's overall price level is rising
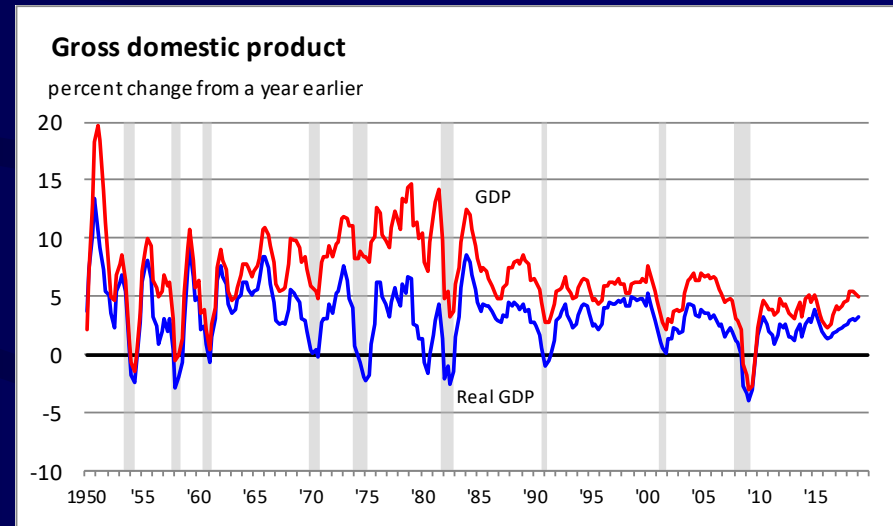 - The inflation rate is the percentage change in the price level from the previous period

Price Indexes

percent

CPI

PCE

GDP deflator

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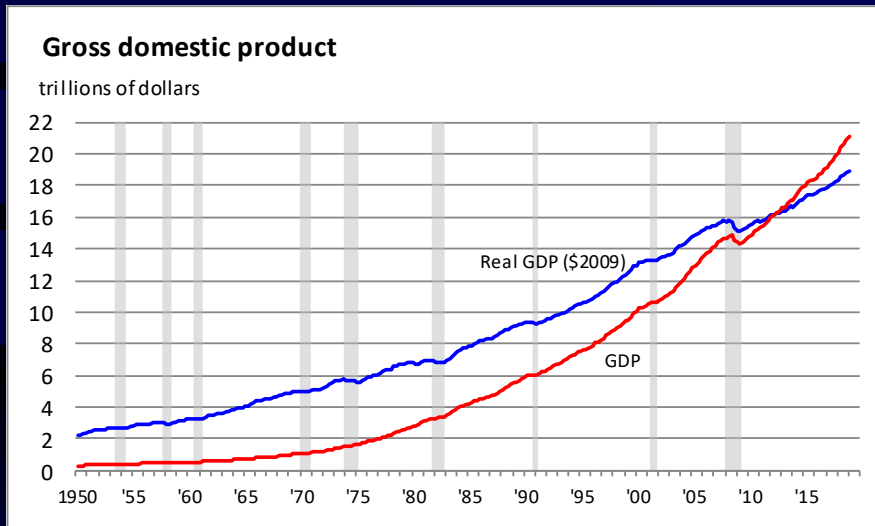
Gross Domestic Product

- Nominal versus Real GDP
  - *Nominal GDP* values the production of goods and services at *current prices*
  - *Real GDP* values the production of goods and services at *constant prices*
  - Changes in nominal GDP can be due to:
    - Changes in prices
    - Changes in quantities of output produced
  - Changes in real GDP can only be due to changes in quantities, because real GDP is constructed using constant year prices
  - An accurate view of the economy requires adjusting nominal GDP to real GDP by using the GDP deflator

Gross Domestic Product

- Nominal versus Real GDP

Gross domestic product

trillions of dollars

Real GDP ($2009)

GDP

Gross domestic product

percent change from a year earlier

GDP

Real GDP

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Gross Domestic Product

- The components of GDP
  - GDP includes all items produced in the economy and sold legally in markets
  - What Is not counted in GDP?
    - GDP excludes most items that are produced and consumed at home and that never enter the marketplace
    - It excludes items produced and sold illicitly, such as illegal drugs
  - GDP (Y) is the sum of the following:
    - Consumption (C)
    - Investment (I)
    - Government Purchases (G)
    - Net Exports (NX)

$$Y = C + I + G + NX$$

Gross Domestic Product
U.S. GDP, 2018

	billions of $	*% of GDP*
GDP	$ 20,494.4	100.0%
Consumption	13,948.5	68.1
Investment	3,650.1	17.8
Government purchases	3,520.8	17.2
Net Exports	-625.4	-3.1

Gross Domestic Product

- The components of GDP
  - Consumption
    - The spending by households on goods and services, with the exception of purchases of new housing
    - Durable goods
      - Last a long time – examples: cars and home appliances
    - Non-durable goods
      - Last a short time – examples: food and clothing
    - Services
      - Work done for consumers – examples: dry cleaning and air travel

Gross Domestic Product
U.S. GDP, 2018

	billions of $	% of GDP
GDP	$ 20,494.4	100.0%
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Investment	3,650.1	17.8
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Gross Domestic Product

- The components of GDP
  - Investment
    - Spending on goods bought for future use (*i.e.*, capital goods)
    - Business fixed investment
      - Spending on plant and equipment that firms will use to produce other goods and services
    - Residential fixed investment
      - Spending on housing units by consumers and landlords
    - Inventory investment
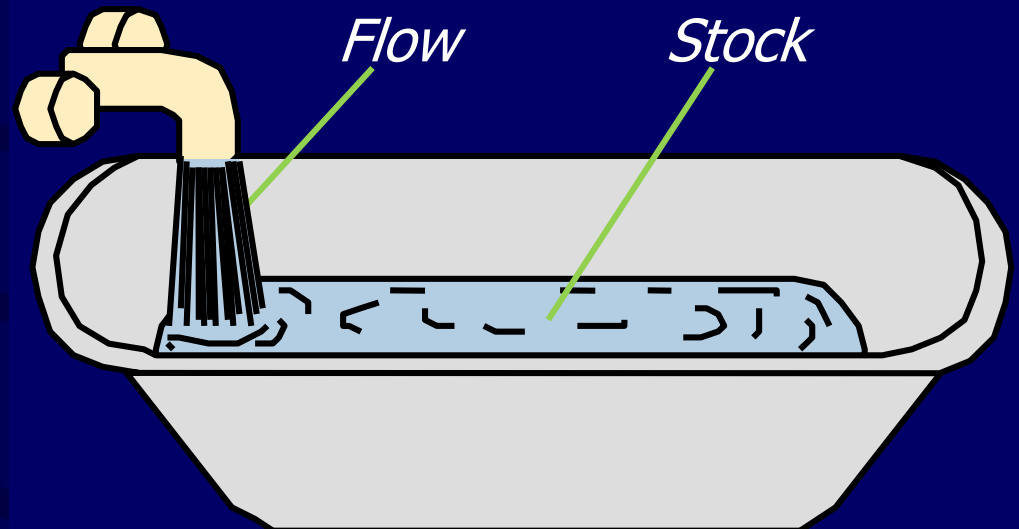   - The change in the value of all firms' inventories

Gross Domestic Product
U.S. Investment, 2018

	$ billions	% of GDP
Investment	$ 3,650.1	17.8%
Business fixed invest.	2,799.1	13.7
Residential fixed invest.	794.5	3.9
Inventory investment	56.5	0.3

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Gross Domestic Product

- Stocks vs. flows

  - A stock is a quantity measured at a point in time

    - We might say "the U.S. capital stock was $26 trillion on January 1, 2017"

- A flow is a quantity measured per unit of time

  - "U.S. investment was $2.5 trillion during 2017"

Flow *Stock*

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Gross Domestic Product

- The components of GDP
  - Government spending
    - Includes all government spending on goods and services
    - excludes transfer payments
      - (e.g. unemployment insurance payments), because they do not represent spending on goods and services
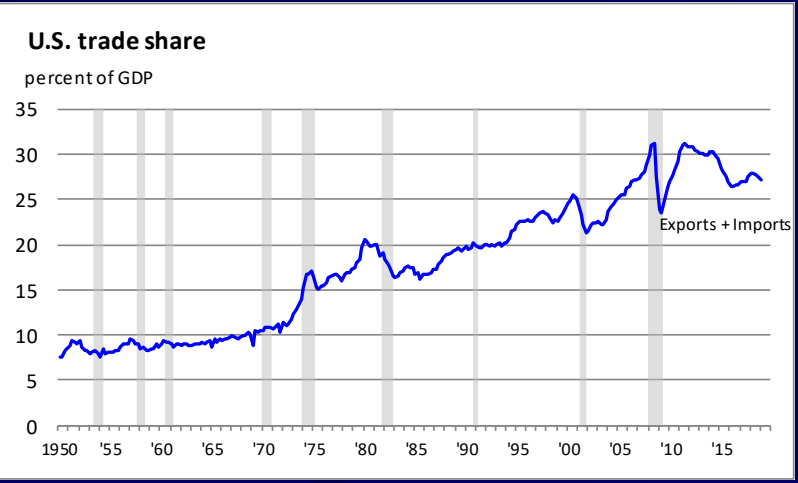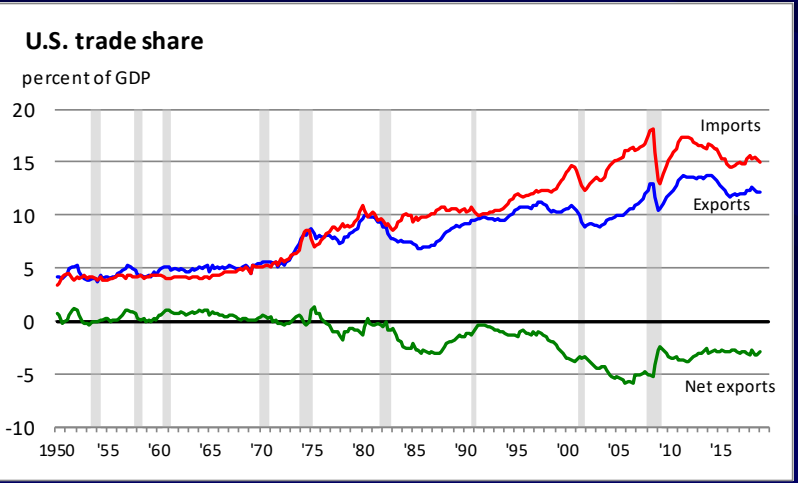
Gross Domestic Product
U.S. Investment, 2018

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Business fixed invest.	2,799.1	13.7
Residential fixed invest.	794.5	3.9
Inventory investment	56.5	0.3

Gross Domestic Product

- The components of GDP
  - Net exports
    - Exports
      - Goods produced domestically and sold abroad
    - Imports
      - Goods produced abroad and sold domestically
    - Net exports – calculated as exports minus imports

U.S. trade share
percent of GDP

U.S. trade share
percent of GDP

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Gross Domestic Product
U.S. Net Exports, 2018

	billions $	*% of GDP*
Net Exports	-$ 625.4	-3.1%
Exports	2,531.3	12.4
Imports	3,156.7	15.4

Gross Domestic Product

- Statistical side-bar
  - Seasonal adjustment
    - One problem with interpreting data over time is that many data series exhibit movements that recur every year in the same month or quarter
    - For example, housing permits increase every spring when the weather improves, while toy sales usually peak in December
    - This dynamic makes it hard for economists to interpret the underlying trend in some data series
    - To understand what the data are really saying about economic growth, statisticians and economists remove such predictable fluctuations—or seasonality—from the data

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Gross Domestic Product

- Statistical side-bar
  - Revisions
    - Advance estimate
      - The first release of quarterly GDP data
      - Released at the end of the month following the end of the quarter being estimated
    - Second estimate
      - Second release of GDP data
      - Released at the end of the second month following the end of the quarter being estimated
      - Revisions to monthly data incorporated but largely the addition of a month of inventories and trade included

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Gross Domestic Product

- Statistical side-bar
  - Revisions
    - Third estimate
      - Third release of GDP data
      - Released at the end of the third month following the end of the quarter being estimated
      - Additional month of trade data
    - Benchmark revision
      - With the July GDP release (advance 2nd quarter estimate) estimates for the most recent 3 years are revised
    - Large benchmark revision
      - Every 5 years or so the BEA undergoes large benchmark revisions to incorporate new methodologies and statistical techniques

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Gross Domestic Product

- Statistical side-bar
    - Annualizing data
        - Adjusting a growth rate to reflect the amount a variable would have changed over a year's time had it continued to grow at the given rate
        - The annualizing methodology offers a simple way to compare the growth rates of economic variables presented across different periods
        - Analysts can regularly assess the monthly or quarterly performance of key economic indicators relative to their changes in recent years

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Gross Domestic Product

- Statistical side-bar
  - Chain weighted indexing (chained dollars)
    - The GDP deflator is not based on a fixed basket of goods and services; the "basket" for the GDP deflator is allowed to change from year to year with people's consumption and investment patterns
    - Specifically, for the GDP deflator, the "basket" in each year is the set of all goods that were produced domestically, weighted by the market value of the total consumption of each good

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Industrial Production

- Industrial production (IP) measures changes in the output of the mining, manufacturing, and gas and electric utilities sectors
  - A declining share of the economy, yet industrial output remains a major explanatory factor for changes in GDP due to its cyclical nature
  - Industrial production is calculated using a value added concept
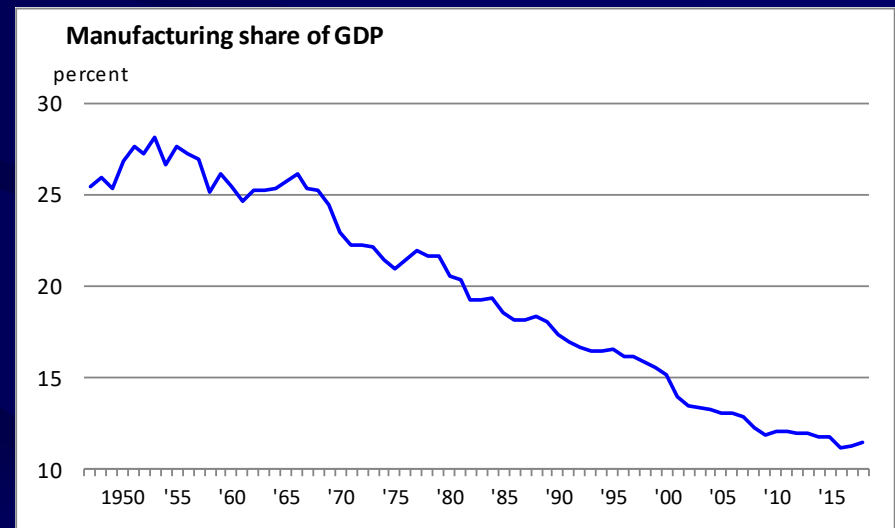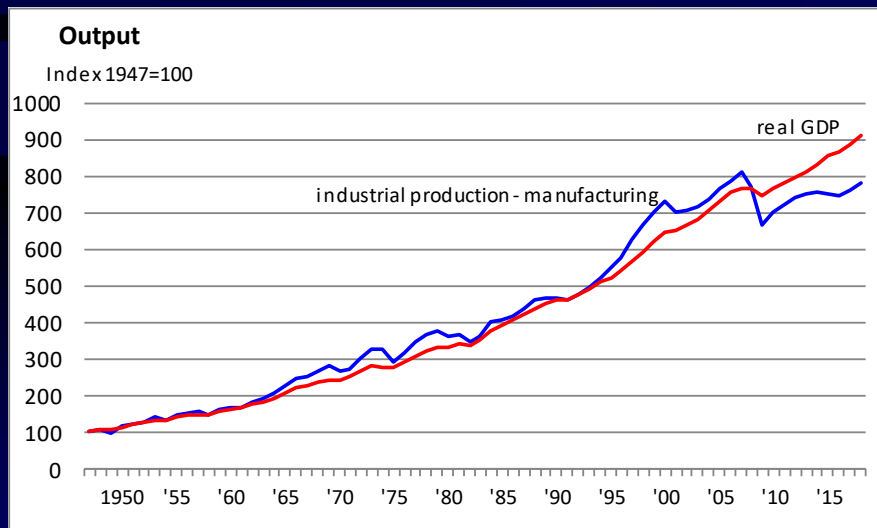
Industrial Production

- Capacity utilization (CU) measures the rate at which mining, manufacturing and public utilities industries operate expressed as a percentage of the maximum rate at which they could operate

Capacity utilization
percent

Capacity
percent change from a year
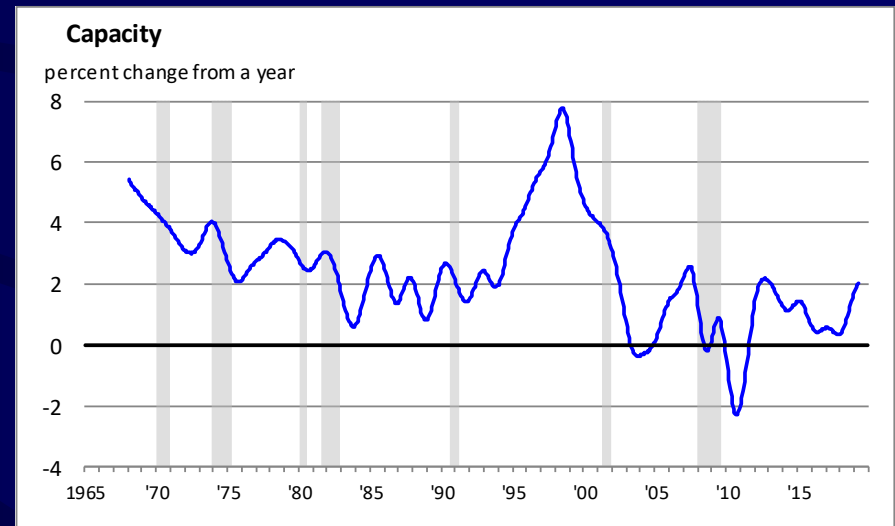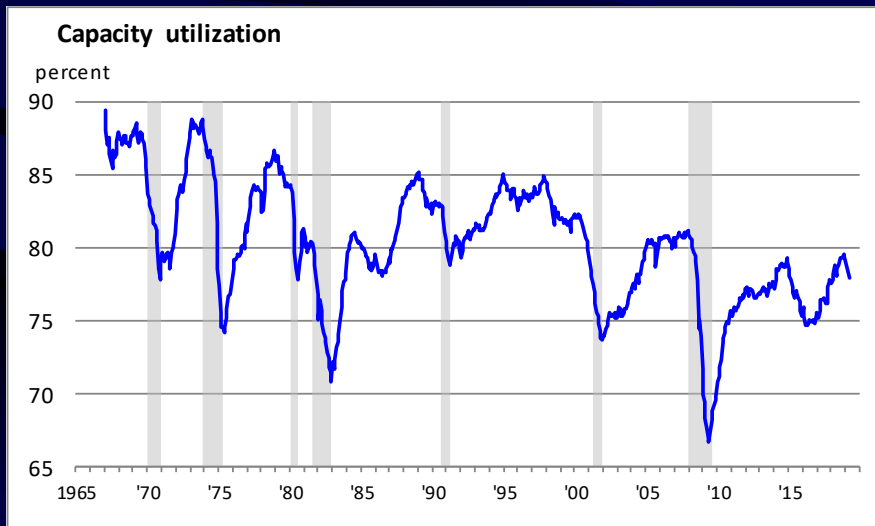
Industrial Production

- Capacity utilization (CU) measures the rate at which mining, manufacturing and public utilities industries operate expressed as a percentage of the maximum rate at which they could operate
- Efficient operation (full utilization) is approximately 79-80%
  1) Above this rate (later stages of the business cycle) it becomes more difficult to: inspect, maintain, and repair equipment
  2) As production increases firms add overtime; second shifts; and third shifts
     - Workers are not uniform – are the last workers hired as good as the first workers hired? (diminishing returns)
     - This often shows up with poorer work quality; backlogs rise; and accidental damage
     - This would lead to output increasing at a slower pace compared with the increase in labor

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Industrial Production

- Capacity utilization (CU) measures the rate at which mining, manufacturing and public utilities industries operate expressed as a percentage of the maximum rate at which they could operate
- Efficient operation (full utilization) is approximately 79-80%
  3) During a recession industrial labor is often cut back sharply as CU declines
     - Deadweight workers are shed
     - Inefficient firms go out of business
       – Creative Destruction (Joseph Schumpeter)
  4) As the recovery begins output returns faster than labor as firms are more efficient having learned how to manage during downturn

Purchasing Managers' Index

- Purchasing Managers' Index (PMI) is calculated and released by the Institute of Supply Management (ISM)
- Purchasing managers at industrial corporations report on business conditions their companies are experiencing
  - New Orders
  - Production
  - Employment
  - Supplier deliveries
  - Inventories
- The composite index equally weights the individual diffusion indexes

Purchasing Managers' Index

- Purchasing Managers' Index (PMI) is calculated and released by the Institute of Supply Management (ISM)

- The data are put into a diffusion index and are month-to-month changes based at 50

- A diffusion index measures the degree to which a change in something is dispersed, spread out, or "diffused" in a particular group

- Members are asked if something has changed and in which direction, they will answer in one of three ways: it has not changed, it has increased, or it has decreased

  – Respondents to ISM surveys indicate each month whether particular activities (e.g., new orders) for their organizations have increased, decreased, or remained unchanged from the previous month

Purchasing Managers' Index

- Purchasing Managers' Index (PMI) is calculated and released by the Institute of Supply Management (ISM)

- The data are put into a diffusion index and are month-to-month changes based at 50

- The ISM indexes are calculated by taking the percentage of respondents that report that the activity has increased ("Better") and adding it to one-half of the percentage that report the activity has not changed ("Same") and adding the two percentages

  - As an example of calculating a diffusion index, if the response is 20 percent "Better," 70 percent "Same," and 10 percent "Worse," the Diffusion Index would be 55 percent (20% + [0.50 x 70%])

- A reading of 50 percent indicates "no change" from the previous month

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Purchasing Managers' Index

- Purchasing Managers' Index (PMI) is calculated and released by the Institute of Supply Management (ISM)
- Economists and statisticians have determined that the farther the index is away from 50, the rate of change is greater

Purchasing managers' index - composite

net percent reporting increases
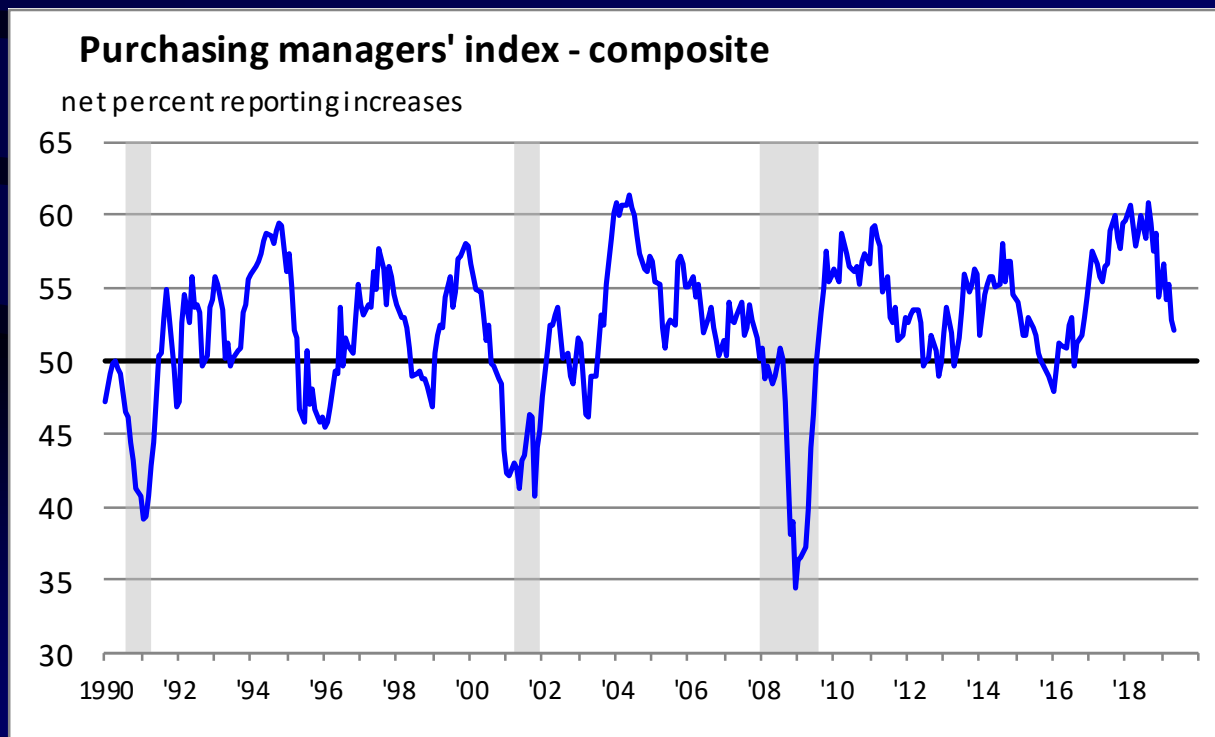
Summary

- Economics course overview
- The circular-flow diagram model
- How is the business cycle defined
- Five basic principles of the business cycle
- Life-cycle Hypothesis
- Efficient Market Hypothesis
- Stock market
- Growth Economics
- Gross Domestic Product
- Industrial Production
- Purchasing Managers' Index