

# Macroeconomic Theory

Economics 104

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Spring 2019

## Why is Trump our President?



He is “like, really smart. ....and a very stable genius at that!”



## State of the Economy

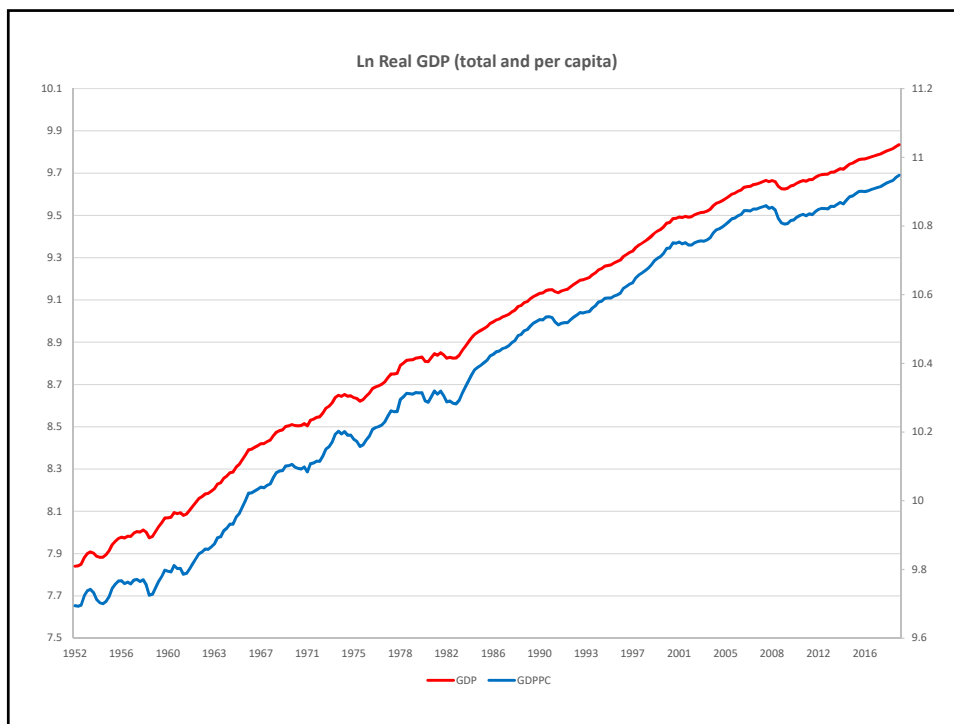
- GDP per capita: \$62,891
- Unemployment rate: 3.9%
- Inflation rate: 1.94%
- Interest rate: 2.45% (6M Tbills)
- Productivity: American workers are more productive than they have ever been in history
  - Labor productivity =  $\frac{\text{output volume}}{\text{labor input}}$
  - How much stuff can a worker produce in one hour?

## Gross Domestic Product

- Market value of all final goods and services produced within a given period of time in the country
- Value of housing, food, education, recreation, etc
- Produced for the market
- $Y = C + I + G + NX$

## Gross Domestic Product

- Nominal GDP \$20,658.2 billion (2018 III)
  - $\sum P_{2018}Q_{2018}$
- Real GDP \$16,665.0 billion (2018 III)
  - $\sum P_{2012}Q_{2018}$
- Per Capita Nominal GDP \$62,891 (2018 III)
  - $Nominal\ GDP / Population$
- Per Capita Real GDP \$50,734 (2018 III)
  - $Real\ GDP / Population$
- GDP deflator
  - $Nominal\ GDP / Real\ GDP$



## Labor Market

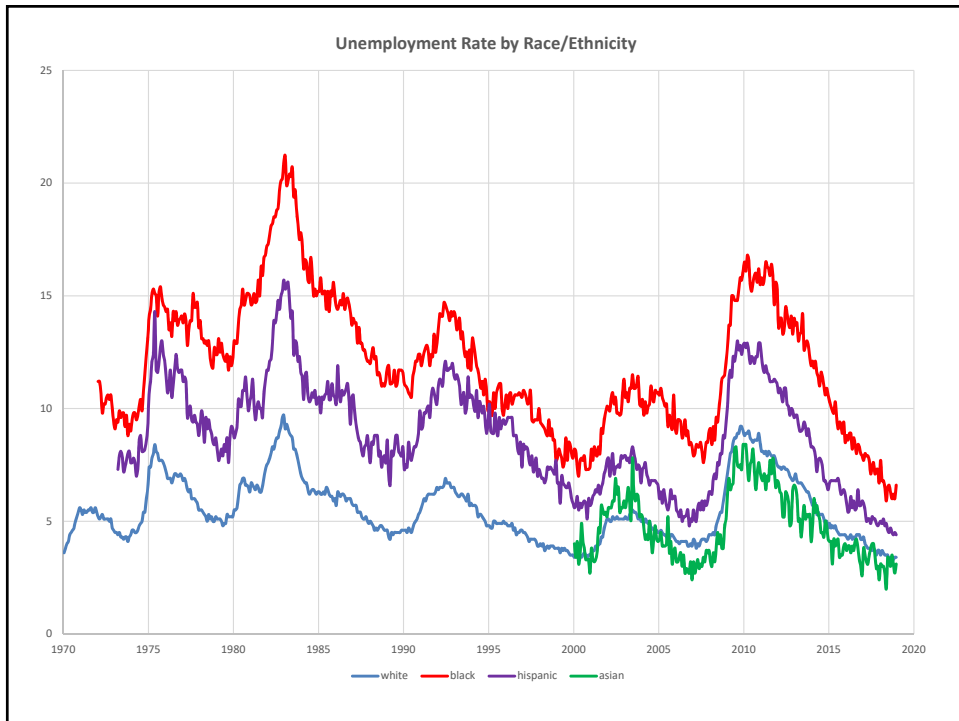
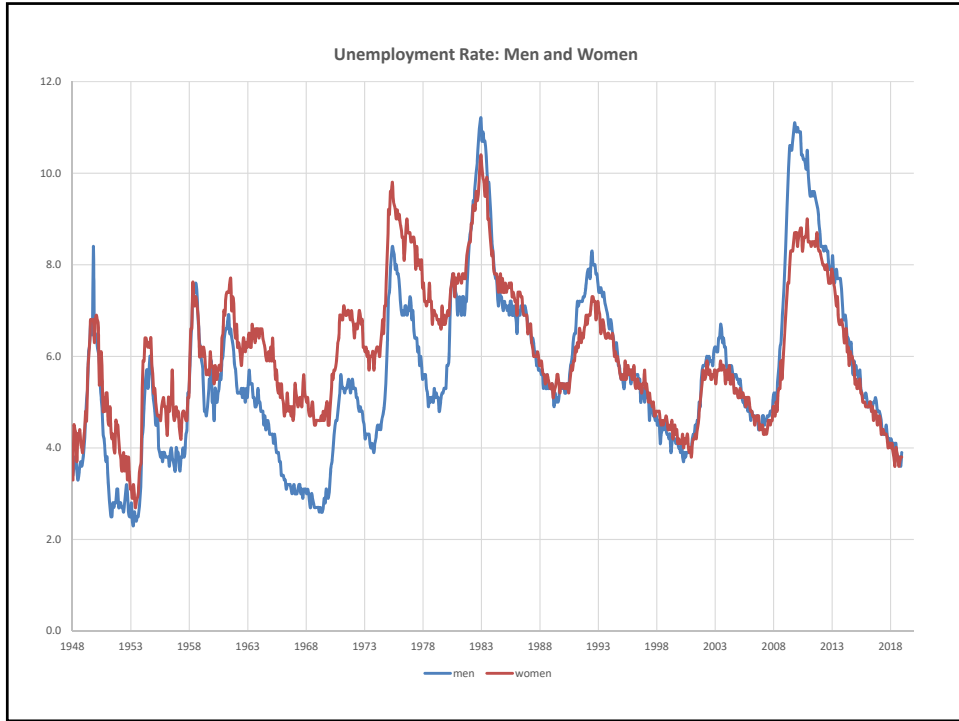
December 2018

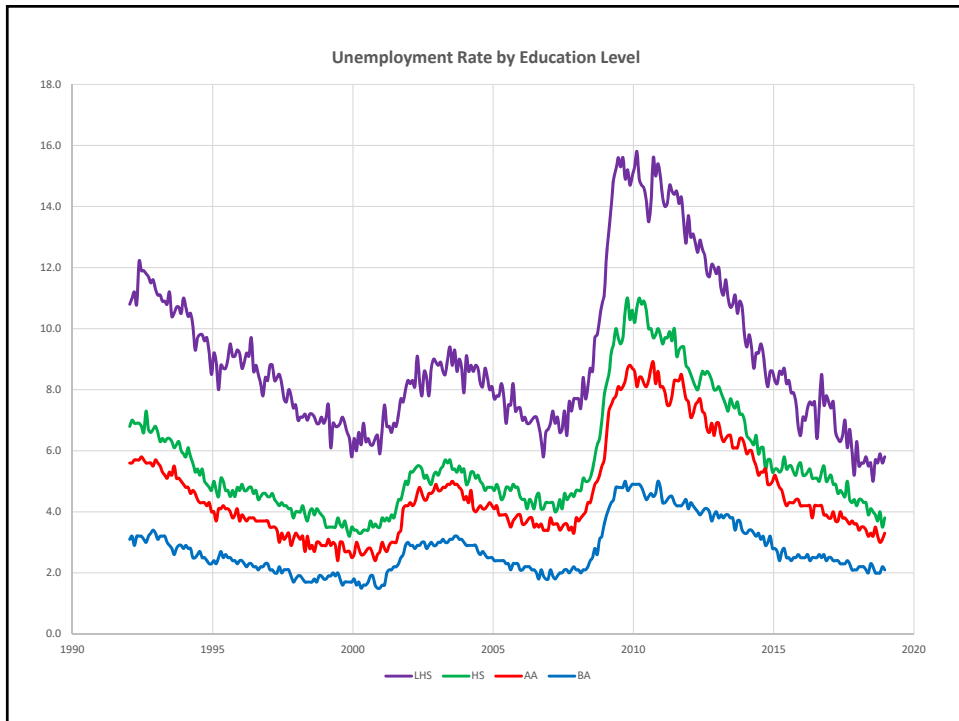
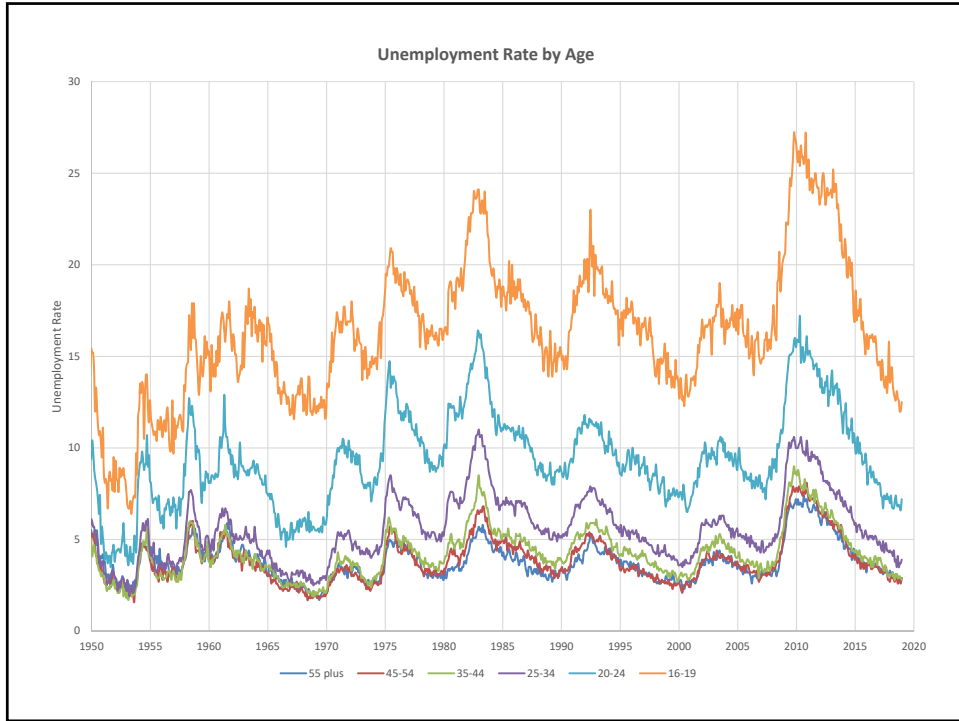
*US Population 329.316 million*

<b>Civilian Noninstitutional Population 258.9 million</b>		
<b>16 years of age and older</b>		
Civilian Labor Force 163.24 million		Not in Labor Force 95.65 million
Employed 156.95 million	Unemployed 6.29 million	

Unemployment Rate = Unemployed/Labor Force = 3.9%

Labor Force Participation Rate = Labor Force/Population = 63.1%



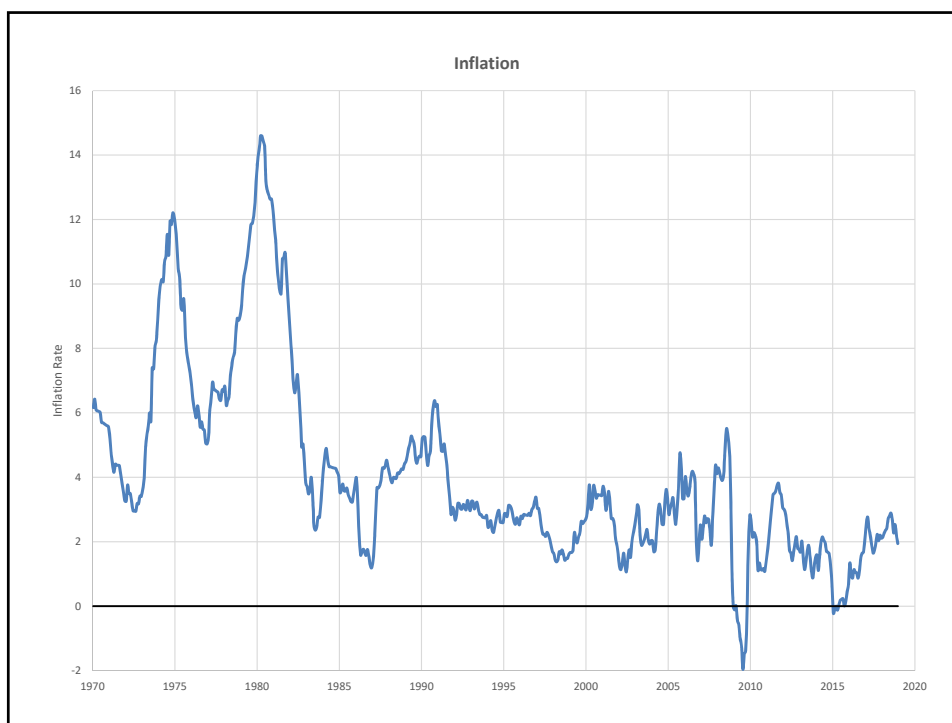


## Inflation

- Price level is a weighted average of prices
  - Consumer price index (CPI)
  - Produce price index (PPI)
  - GDP deflator
- Inflation is the rate of growth of the price level
  - $\text{inflation } \pi = \frac{PL_t - PL_{t-1}}{PL_{t-1}}$
  - % per annum

## Consumer Price Index

- Inflation in 2018
  - Dec 2017 to Dec 2018
- $\frac{CPI_{2018} - CPI_{2017}}{CPI_{2017}} = \frac{252.73 - 247.91}{247.91} = 1.94\%$



## Interest Rates

Cost of borrowing money (or holding money)

- Depends on length of time and perceived risk

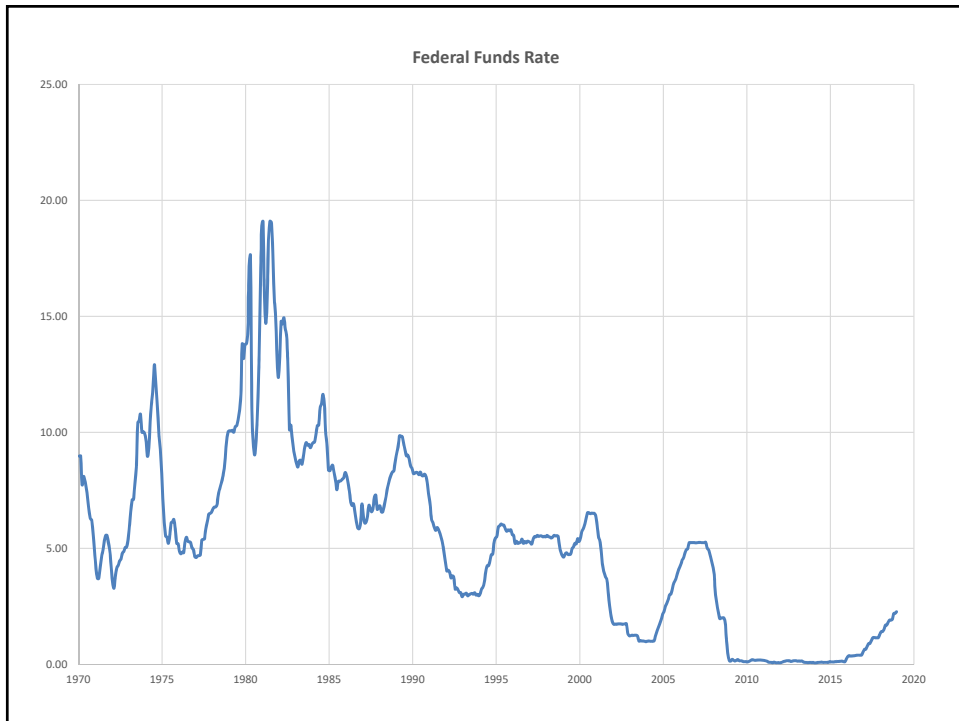
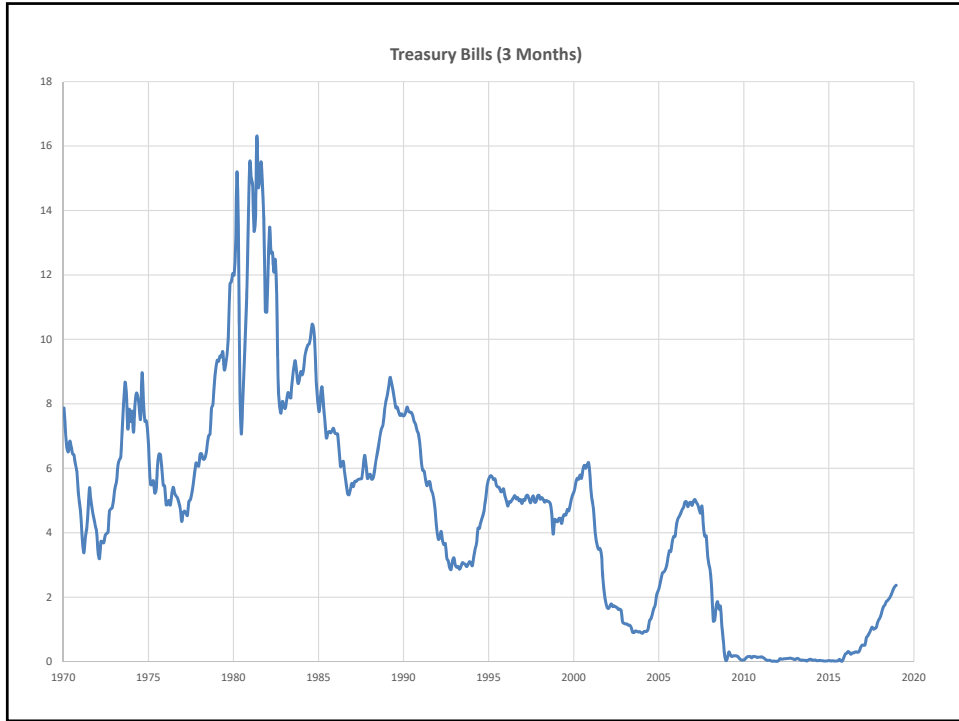
Nominal interest rates

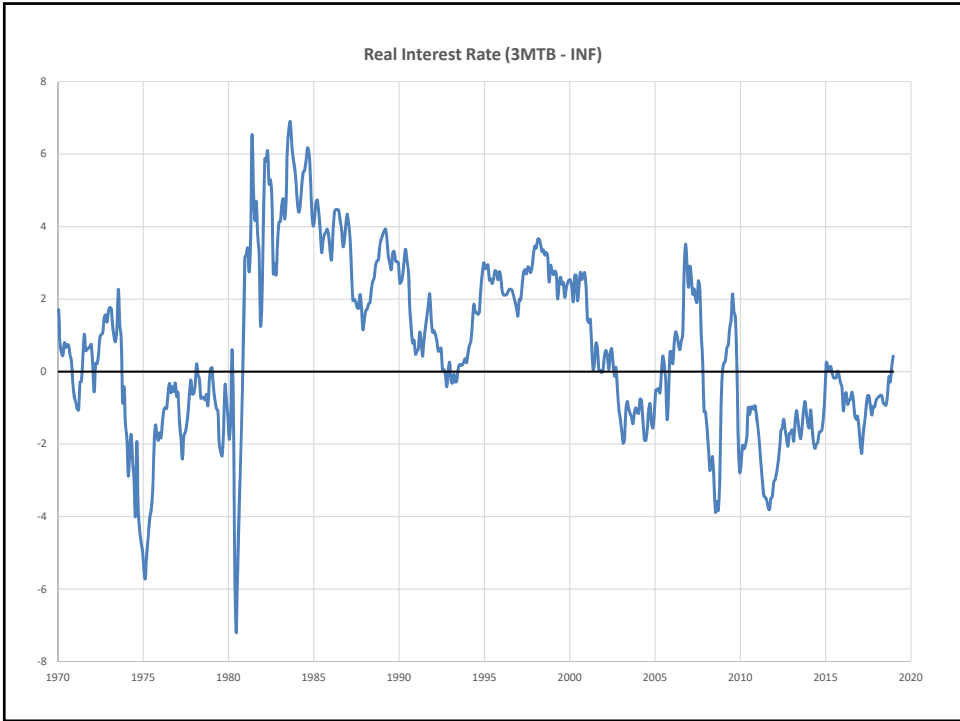
- Treasury bills, notes, bonds
- Corporate bonds, Mortgages

Real interest rate

- Nominal interest rate – inflation rate







### U.S. Life Expectancy

Year	Life Expectancy
2014	78.9 years
2015	78.8 years
2016	78.7 years
2017	78.6 years

Gender	2017
Men	76.1 years
Women	81.1 years

70,237 Americans died of drug overdoses in 2017  
(47,600 deaths from the opioid epidemic)

## Growth (Interest) Rates

Year	Growth Rates					
	0%	2%	4%	6%	8%	10%
0	\$100	\$100	\$100	\$100	\$100	\$100
1	\$100	\$102	\$104	\$106	\$108	\$110
10	\$100	\$122	\$148	\$179	\$216	\$259
25	\$100	\$164	\$267	\$429	\$685	\$1,083
50	\$100	\$269	\$711	\$1,842	\$4,690	\$11,739
75	\$100	\$442	\$1,895	\$7,906	\$32,120	\$127,190
100	\$100	\$724	\$5,050	\$33,930	\$219,976	\$1,378,061

## Miracle of Compound Growth

If per capita GDP grows at 2.25% a year, the standard of living **DOUBLES** every 32 years.

From 1870 to 2000, per capita GDP in the US grew over 2% a year.

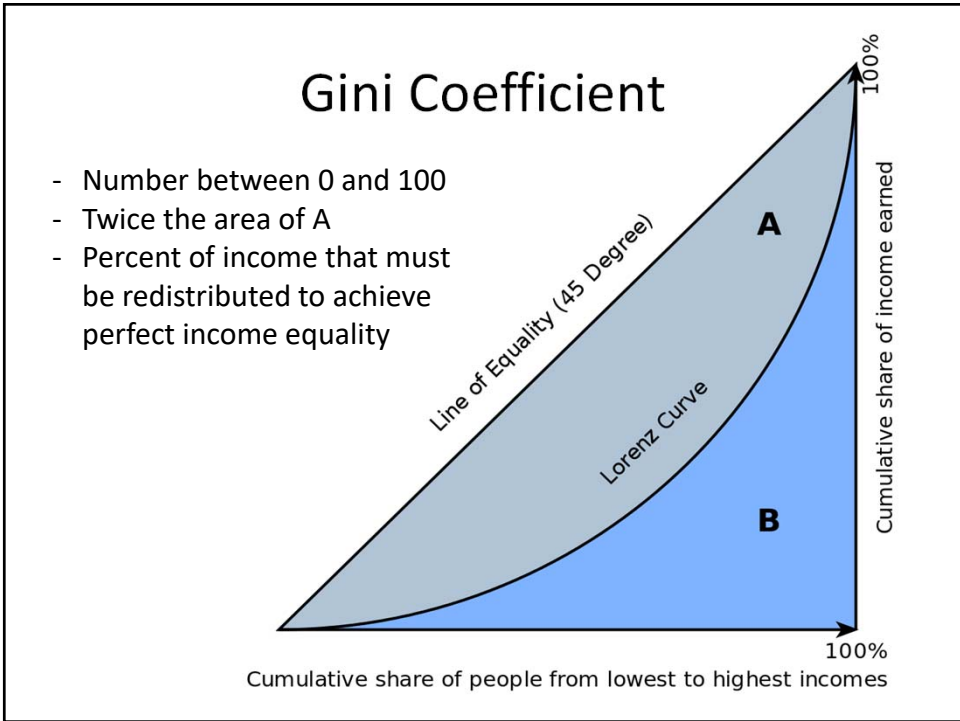
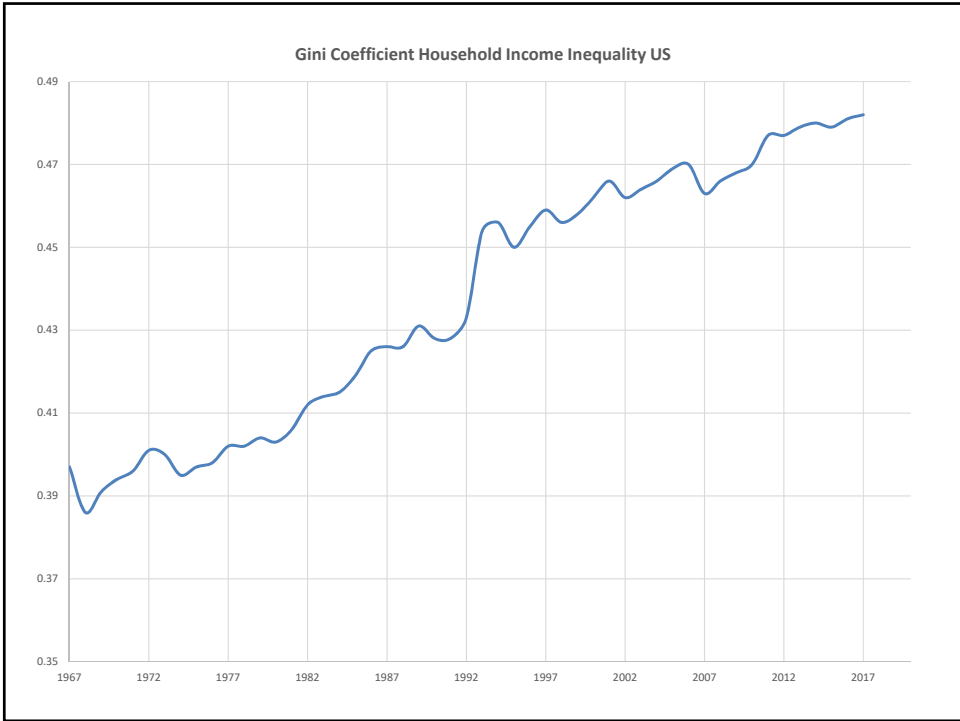
Americans are used to seeing the standard of living double with every generation.

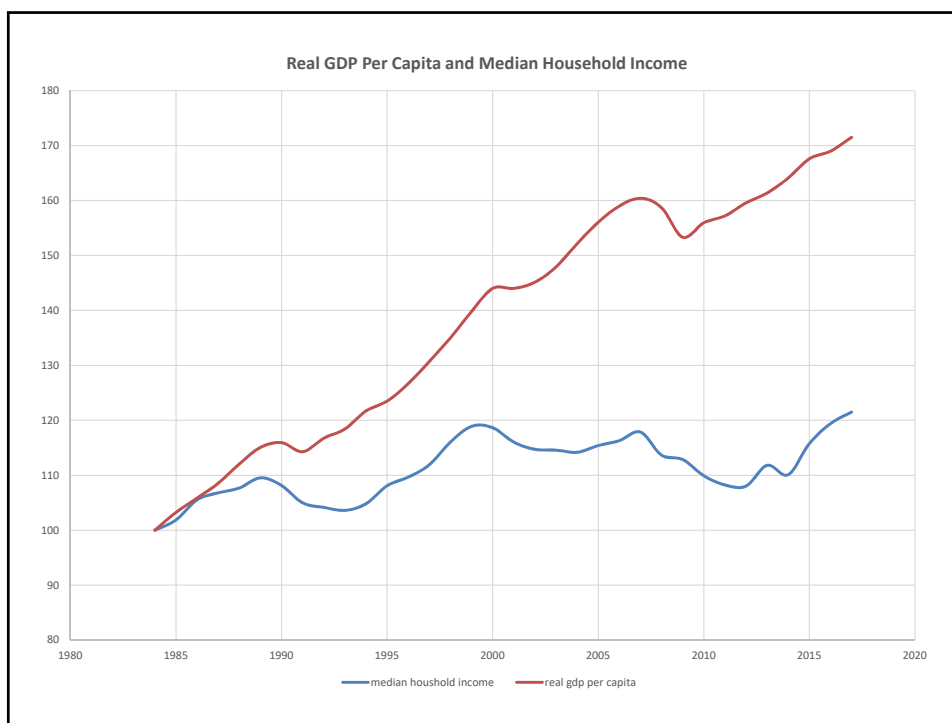
## The U.S. Economy

Time Period	Growth Rate		
	Real GDP Per Capita	Productivity	Employment
1955-1970	2.13%	2.04%	1.41%
1970-1985	2.32%	1.01%	2.16%
1985-2000	2.21%	1.84%	1.62%
2000-2015	0.93%	1.25%	0.58%

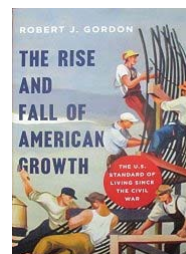
## Labor Force Participation

- Male labor force participation rates have fallen from 87% to 69%
- Female labor force participation rates have increased from 32% to 60% (2000)
- Since 2000, female labor force participation rates have fallen to 56.6%
- Overall labor force participation has fallen from 67.3% (2000) to 62.4% (2015)



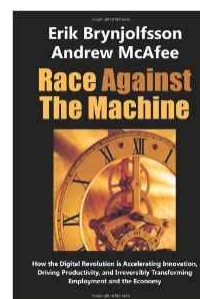


## Robert Gordon



- Pessimistic view
- Dramatic scale of inventions and innovations between 1870 and 1970 were a one-time occurrence in human history
- Productivity growth will be much slower in the future
- Aging population, stagnating education, consumer and government debt, income inequality

## Brynjolfsson & McAfee



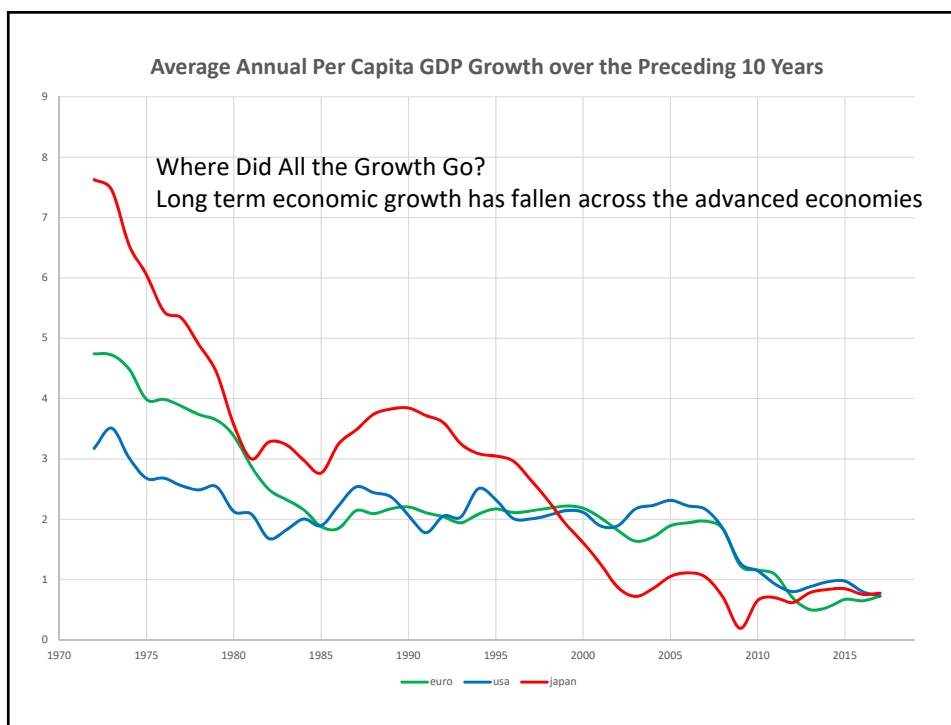
- Optimistic view
- Industrial revolutions are led by general purpose technologies which take time to be adopted economy-wide (steam engine, electricity, computer)
- We are on the cusp of seeing the productivity advances resulting from the computer



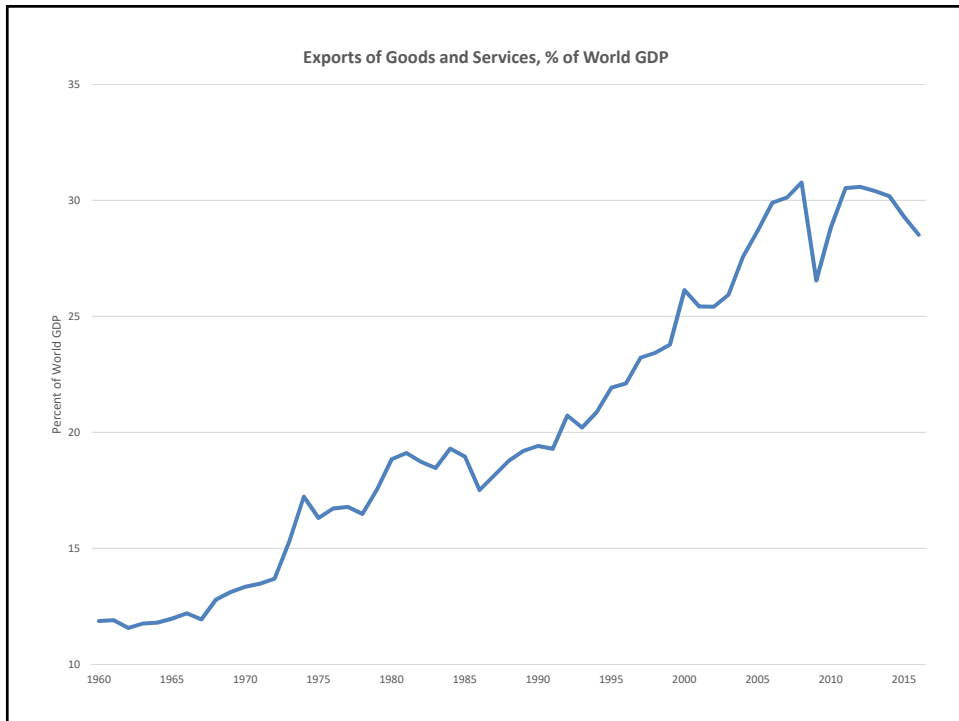
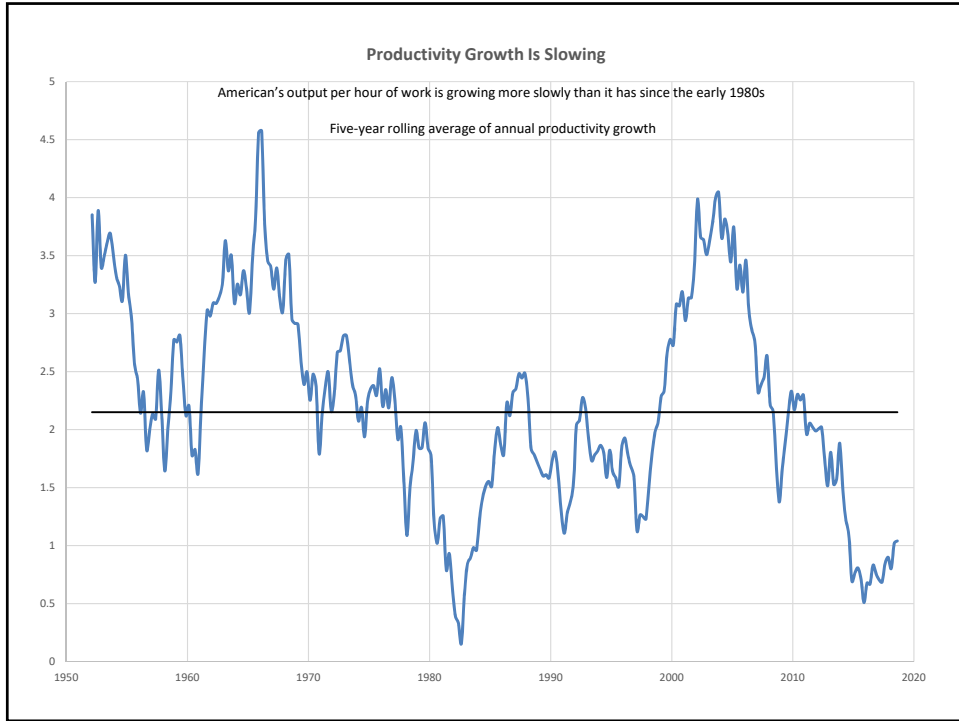
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## Productivity Decline

- Depressing scenario
  - Productivity slowdown is real
  - Earlier technology has been fully implemented
- Neutral scenario
  - Measurement error
  - GDP does not measure services well
    - Skype my son in NY for free
- Happy scenario
  - We are currently investing in the economy
  - Productivity will improve when new capital is fully implemented







## Why did trade grow?

- Improvements in transportation
  - Cheaper shipping
    - 1956 Container ships carry 500-800 TEU
    - Today container ships carry 18,000 TEU
  - Cheaper air transport
    - Boeing 707 (1958) long distance jet
    - Boeing 747 (1970), Airbus A380 (2007) wide body jets
- Advances in telecommunication
  - Transatlantic telegraph cable 1858
  - Transatlantic telephone cable 1956
  - First ARPANET email 1971
- More technological goods
  - Light and easy to transport
- Free trade policies
  - GATT (1947), WTO (1995)
  - Average tariff rates fall from 7.3% in 1960 to 1.3% in 2010



## Macroeconomic Theory

Textbook: *Macroeconomics*, N Gregory Mankiw, 10<sup>th</sup> edition, Worth Publishers, 2019.

Requirements:

Six problem sets (30%)

Midterm exam (March 7) (30%)

Final exam (May 13) (40%)

Optional essay (extra credit)

## Contact Information

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- Office hours: Mon 12:35-1:35, Tues 4:00-5:00, Fri 11:00-12:00, and by appointment
- Join me for lunch every Friday from 12 noon – 1pm in the East Wing of McConnell Dining Hall

## Course Outline

- I. Long Run
  - Prices and wage are flexible
  - How does the economy behave?
- II. Short Run
  - Prices and wages are sticky
  - How does the economy behave?
- III. Microeconomic Foundations of Macroeconomics

## History of Macroeconomics

Classical Macroeconomics 1800s

- Adam Smith *Wealth of Nations* (1776)
- Says Law: Supply creates its own demand
- Prices and wages are perfectly flexible
- Economy is always in equilibrium
- No persistent gluts or depressions

## History of Macroeconomics

Keynesian Revolution 1930s

- John M. Keynes *The General Theory* 1936
- Attacked Say's Law
- Prices and wages are sticky
- Markets do not clear
- Economy can have persistent gluts and unemployment

## Classical Theory: The Economy in the Long Run

- What determines the total production of goods and services?
- How is national income distributed to the factors of production?
- What determines the demand for goods and services?
- What brings the supply and demand for goods and services into equilibrium?

## What do we know so far?

- $Y = C + I + G + NX$
- $Y = \text{wages} + \text{profits} = wL + rK$
- $Y = C + S + T$
- $S_g = T - G$
- $I = S_p + S_g + S_f$
- Prices and wages are flexible
- All markets clear

## Classical Long Run Model

- Level of output is determined by the Production Function
  - $Y = F(K,L)$
  - Level of K, L exogenous
- Who gets the output?
  - $Y = wL + rK$ 
    - $w = MP$  of labor
    - $r = MP$  of capital

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

- Consumption
  - $C = C(Y-T)$
  - Marginal Propensity to Consume  $\frac{\partial C}{\partial (Y-T)}$
- Investment
  - $I = I(r)$
- Government Spending (exogenous)
  - President and Congress determine G, T
- Net Exports (assume closed economy)
  - $NX = 0$

- Why does supply = demand?
  - The real interest rate adjusts to make sure the supply of goods equals the demand for goods at the aggregate level.
  - The demand for loans equals the supply of loans

## Implications

- Expansionary fiscal policy
  - Increase G or decrease T
  - No effect on output
  - Interest rates increase
  - Investment falls
  - Complete crowding out
- Increased investment demand
  - Interest rates increase
  - No effect on output
  - Level of investment does not change