Macroeconomic indicator 1

Inflation is the percentage change in the Price Level (*PL*) from one year to the next.

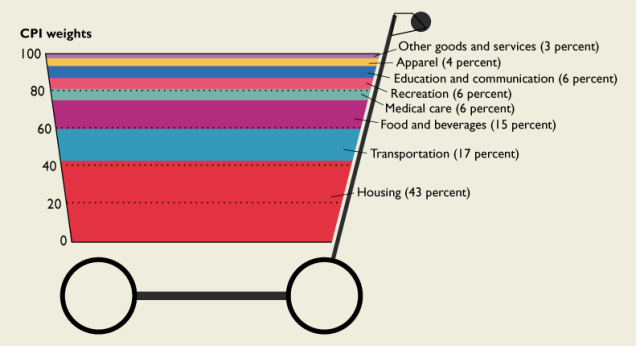
The Consumer Price Index (CPI) is

- BLS calculates the CPI every month by computing
- CPI is calculated each month by
- The CPI basket in 2007 is based on information obtained from
- The survey is used to assign weights to each item in the CPI basket to reflect the
- Because the CPI is used to measure price changes, it is important that
- We can use these numbers in the CPI to compare what a fixed basket of goods costs

Inflation

Consumer Price Index

- The CPI uses a weighted average of the cost (in dollars) of goods and services
- The figure below shows the weights used in the CPI market basket
- The CPI market basket is a collection of 80,000 consumer goods and services that an average household buys in 30 metro areas.
- The CPI for a given year equals the *PL* in that year divided by the *PL* in the base year.



Inflation

- Suppose I am the "typical" urban consumer and that the government interviews me to determine what goods should be in the CPI market basket.

Good	Average quantity purchased per month	Price on 11/06	Total Cost
gallons of milk	4	2	
TVs	0.01	400	
Computers	0.01	1000	
Towncars	0.005	50,000	
Snickers	15	0.50	
32 oz Pepsi	30	1	
6 packs of Busch Light	2	6	
Socks	4	2	
Chickens	5	3	
Rib-eye steaks	10	10	
Boxes of Raisin Bran	4	3	
Cable TV	1	40	
Pay-per view CFB games	5	15	

Cost of the CPI basket in 11/06 = _____

Inflation

$$CPI_{current\ year} = \frac{PL_{current\ year}}{PL_{base\ year}} 100\%$$

Month	*PL*	CPI
4/1/1983		
5/1/1983		
6/1/1983		
7/1/1983		
8/1/1983		
9/1/1983		
10/1/1983		
11/1/1983		

Base year = 1983

8/1/2006		
9/1/2006		
10/1/2006		
11/1/2006	571.50	
12/1/2006		
1/1/2007		
2/1/2007		

Numbers in the CPI are percentages

Inflation

The inflation rate

$$Inflation = \frac{CPI_{is} - CPI_{was}}{CPI_{was}} 100\%$$

- **Inflation** is a
- **Disinflation** occurs when
- **Deflation** is a

Month	CPI	Inflation
7/1/2008	219.96	
8/1/2008	219.09	
9/1/2008	218.78	
10/1/2008	216.57	
11/1/2008	212.43	
12/1/2008	210.23	
1/1/2009	211.14	
2/1/2009	212.19	
3/1/2009	212.71	
4/1/2009	213.24	
5/1/2009	213.86	
6/1/2009	215.69	
7/1/2009	215.35	
8/1/2009	215.83	
9/1/2009	215.97	
10/1/2009	216.18	

Inflation

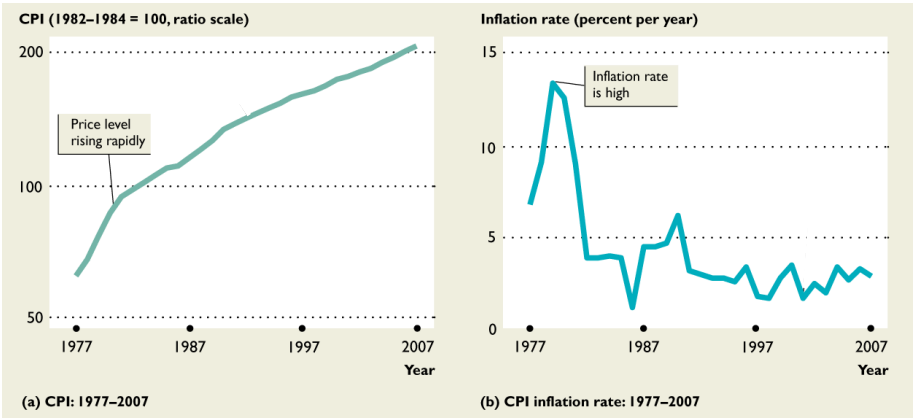
Consumer Price Index (Fig. 22.2)

In part (a), the price level has

The steeper the CPI curve the

The flatter the CPI curve the

From the late 1970s there



Inflation

Although the CPI is used as a Cost Of Living Adjustment (COLA) it's not a COLA because

1. It does not measure all the components of the
2. Some components are not
3. So the CPI is

New Goods Bias

- New goods do a better job than the
- The arrival of new goods puts

Quality Change Bias

- Better cars and televisions cost
- A price rise due to improved quality

Commodity Substitution Bias

- If beef's price of rises faster than chicken's,
- The CPI basket doesn't change

Outlet Substitution Bias

- If prices rise more rapidly,
- The CPI basket

The Boskin Commission estimated the bias to be per year. To reduce the bias in the CPI the BLS now updates the CPI basket every 2 years.

Inflation

Distortion of private contracts is a consequence of the bias in the CPI are

- Many wage contracts are linked to the CPI.
- If the CPI is biased, these contracts might deliver an outcome different from that intended by the parties.

Example: Suppose that the UAW and GM sign a 3 year wage deal: In the first year, the wage will be $30 which rises by the inflation rate in the next two years. Assume this contract will affect 30,000 GM employees, each working 40 hours per week, 50 weeks per year. Assume actual inflation is 2% per year but bias in the calculation pushes it up to 5%.

The contract results in the following wages

using biased inflation	*using actual inflation*
$w_1 = 30$	$w_1 = 30$

Total hours worked at GM per year

Total labor expenses using biased inflation

Total labor expenses using unbiased inflation

Inflation

Bias in the CPI increases in government outlays

- Close to a third of federal government outlays are linked directly to the CPI.
- The CPI is used to adjust
  - Social Security benefit payments to 65 or older (as of 11/13)
  - Social Security disability payments to under 65 (as of 11/13)
  - food stamp payments (as of 10/13)
  - the budget for school lunches (fy 2013).

Bias in the CPI decreases tax revenue

- The CPI is used to adjust the income levels at which higher tax rates apply.
- Because tax rates on large incomes are higher than those on small incomes as incomes rise, the burden of taxes would rise relentlessly if these adjustments were not made.
- The upward bias means tax adjustments over-compensate for rising prices, moving people from higher tax brackets to lower ones, resulting in a decrease in the amount paid in taxes.

Inflation

Nominal price and real price

- To compare dollar amounts at different dates, we need to know the CPI at those dates.
- The price of a Hershey bar in 1936 cost 5 cents (1.5 oz) but now costs $1.10 (1.55oz) (see: http://www.foodtimeline.org/foodfaq5.html)

Price of a 1936 Hersey in 1936$ = 5 cents

Price of a 1936 Hersey in 2009$

Inflation

Nominal wage and real wage

- Suppose you made $16.73 per hour in 2006.
- This is the nominal wage valued in 2006 dollars
- If you want to compare wages from year to year you have to convert them into real values

2006 wage rate in 2006$ = 16.73

2006 wage rate in 1983$

Inflation

Other price indices

1. The **GDP deflator** is an average of prices of all the goods and services included in Gross Domestic Product (GDP is the dollar value of our economy's total ouput)

GDP deflator =

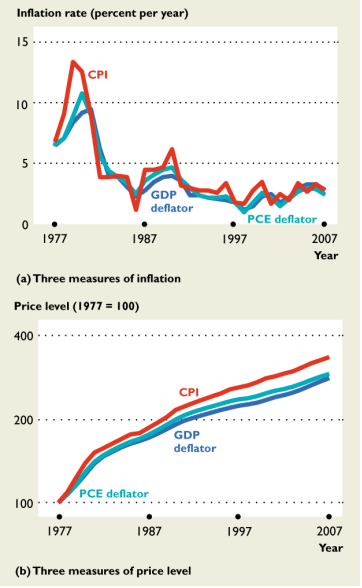
- Since the GDP deflator is a measure of the *price level* its percentage change is a measure of the *inflation rate*.
- The GDP deflator
  -
  -
  -
  -
  -

  The GDP deflator is less affected by the biases of the CPI.
- However, CPI bias is injected into the deflator because when the Commerce Department estimates quantities it divides expenditures by price indexes, one of which is the CPI.

2. The **PCE deflator** is similar to the GDP deflator but is an average of current prices

Inflation

Comparing Price Indices (Fig. 22.3)



The three measures of the inflation rate fluctuate together, but the CPI measure rises more rapidly than the GDP deflator measure or the PCE deflator measure.

In part (b), the CPI measure of the price level is the highest and the PCE deflator lies between the CPI and the GDP deflator.

The CPI measure overstates the inflation rate.

Inflation

Costs of expected inflation

- Menu costs –
- Shoe leather costs –
- Psychic dislike –
- Inflation taxes –

Inflation decreases the purchasing power of the dollar

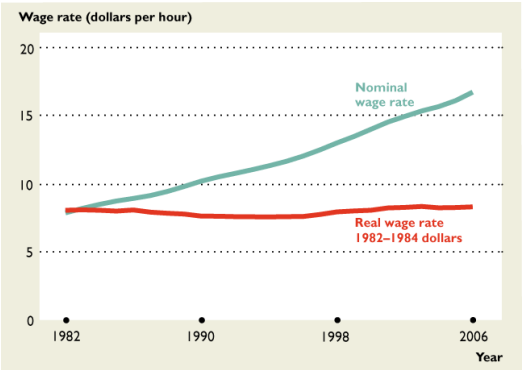
- The dollar does not go as far as it use to
- The **nominal** value of some thing
- The **real** value of some thing is measured in the dollars of a given reference

- Macroeconomics makes a big issue of the distinction between nominal values and real values:
  - Nominal price and real price
  - Nominal wage rate and real wage rate
  - Nominal interest rate and real interest rate
  - Nominal GDP and real GDP

Inflation

The figure shows nominal and real wage rates: 1982–2006.

The nominal wage rate has increased every year since 1982.



Inflation

Nominal and Real Interest Rates

- **Nominal interest rate** is the percentage return on a loan expressed in dollars.
- **Real interest rate** is the percentage return on a loan, calculated by purchasing power—the nominal interest rate adjusted for the effects of inflation.
- Real rate of return (r) is the nominal interest rate (i) less inflation (π)

$$r = i - \pi$$

Inflation

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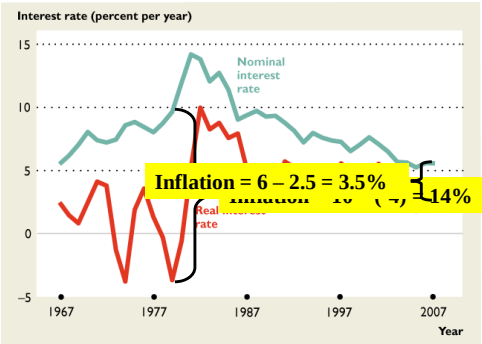

Macroeconomic indicator 2

Economic growth

- The economic growth rate = the percent change in **real Gross Domestic Product** (GDP)

- **Nominal GDP** (nGDP) is the market value of all the final goods and services produced within a country exchanged in formal/legal markets during a given time period
  - Nominal GDP is the economy's output valued at the current year's prices

  - Real GDP is the economy's output valued at the base year's prices

- The percent change in **nominal GDP** ≈ *growth + inflation*
- In practice, nominal GDP is computed using the income or expenditure approaches:
  - nGDP = Wages + Interest + Rents + Profits
    + Indirect taxes – Subsidies + Depreciation
    + Statistical discrepancy
  - nGDP =

Economic growth

Inclusions/exclusions in nGDP

- Only the final goods and services count; e.g.,
  - Only the Dell computer you buy is counted,
  - An Intel chip sold to your computer geek neighbor George
  - The 2008 Toyota you buy is counted, the tires that came with it
- Only goods that pass through organized/legal markets are counted.
  - Illegal gambling and drugs are not counted, neither are garage sales.
    - The "underground" economy is estimated by many to be more than
  - Leisure is not counted
  - GDP would be if unpaid housework was included (Ann Chadeau, "What is Households' Non-Market Production Worth?" *OECD Economic Studies* 18, 1992, pp. 85-103)
- Only those goods produced within the boundaries of the USA
- Sales of used goods and existing homes
- Purchases of stocks and bonds
- Wars and natural disasters
- Pollution (a bad) is

Economic growth

Nominal GDP and Real GDP

$$GDP_{2004} = \frac{nGDP_{2004}}{PL_{2004}} \times 100$$

Year	GDP in billions of current dollars	GDP implicit price deflator (%)	GDP in billions of chained 2005$
1997	8,332.40	84.56	
1998	8,793.50	85.51	
1999	9,353.50	86.77	
2000	9,951.50	88.65	
2001	10,286.20	90.65	
2002	10,642.30	92.12	
2003	11,142.10	94.10	
2004	11,867.80	96.77	
2005	12,638.40	100.00	
2006	13,398.90	103.26	
2007	14,077.60	106.21	
2008	14,441.40	108.48	

Economic growth

The economic growth rate

$$g = \frac{GDP_{is} - GDP_{was}}{GDP_{was}} 100\%$$

- An **expansion** occurs when the economic growth
- A **recession** occurs when *g* is negative
- A **depression** is a long lasting

Year	Real GDP	Econ growth rate
1997	9,854.30	
1998	10,283.50	
1999	10,779.80	
2000	11,226.00	
2001	11,347.20	
2002	11,553.00	
2003	11,840.70	
2004	12,263.80	
2005	12,638.40	
2006	12,976.20	
2007	13,254.10	
2008	13,312.20	

Economic growth

Standard of Living over time

- If the economic growth rate exceeds the grow rate of the population the current generation is better than previous generations
  - In 1967, real GDP in the United States was $3942.5 billion and the population of the United States was 198.712 million.

    Real GDP per person in 1967
  - In 2008, real GDP in the United States was $13,312.2 billion and the population of the United States was 304.06 million.

    Real GDP per person in 2008
- If the population growth rate exceeds a country's economic growth rate the current generation is worse off than previous generations.

Economic growth

Standard of Living over time

- The figure shows the long-term trend in U.S. real GDP per person.
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-
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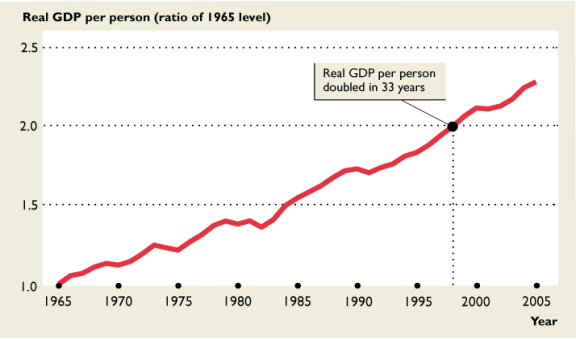

Economic growth

The business cycle

- Fluctuations in the pace of expansion of real GDP is called the business cycle.
- The business cycle is a periodic irregular up-and down movement in the output of the economy.
- The four stages of a business cycle are
- The shaded periods show the recessions—

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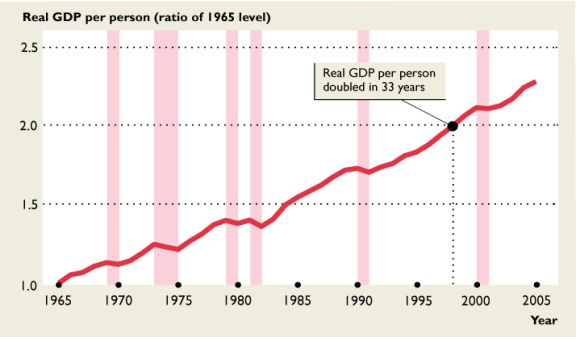
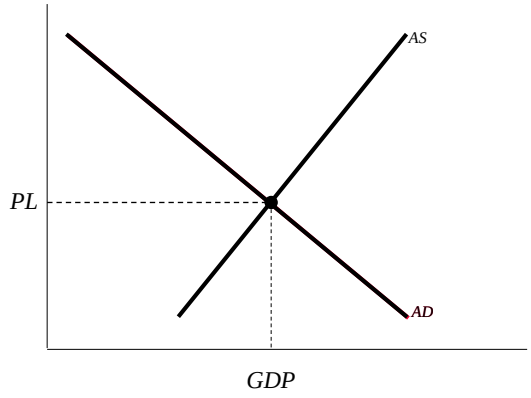


Inflation and Economic growth

The *PL* and *GDP* are determined by aggregate demand (AD) and aggregate supply (AD)



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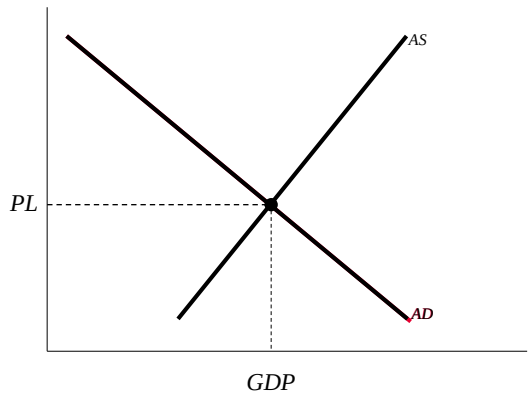


Macroeconomic indicator 3

Unemployment rate

- The Current Population Survey is a joint project of the BLS and the Bureau of the Census
- Every month, 1,600 CPS interviewers survey 60,000 households to establish job market status of each member of the household.
- Working-age population (WAP) = all people aged not jailed, hospitalized, institutionalized nor in the U.S. Armed Forces.
- Labor force (L) is the number of people employed plus
- The CPS counts as employed (E) all those in the WAP who, during the prior week, either
  1. Worked at least in a paid job or unpaid in family business.
  2. Were not working but who had jobs from which they were temporarily absent.
- The CPS counts as unemployed (U) all those in the WAP who, during the prior week,
  1. Weren't working but were available for work,
  2. Looked for work during the previous OR were waiting to be recalled to a job from which they had been laid off.
- The unemployment rate:

Unemployment rate

$U = L - E$ $u = \frac{U}{L}$ x 100%

Year	Labor Force	Employed	Unemployed	*u*
2001	143,768,917	136,939,333		
2002	144,856,083	136,480,917		
2003	146,499,500	137,729,250		
2004	147,379,583	139,239,750		
2005	149,291,750	141,713,500		
2006	151,412,500	144,420,083		
2007	153,126,333	146,049,500		
2008	154,329,250	145,368,417		

Types of unemployment

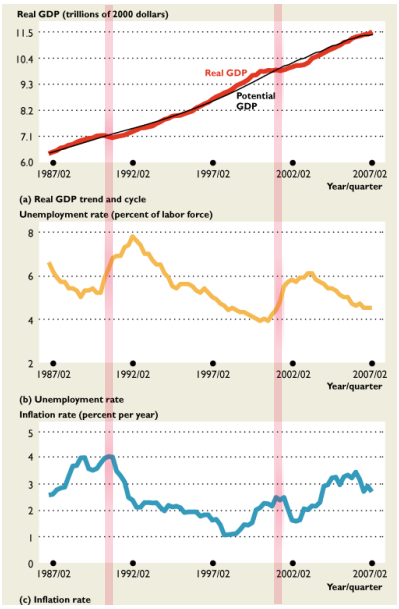
- Frictional (u_f)*:* workers temporarily between jobs because of a move/career change.
- Structural (u_s): workers displaced by automation.
- Cyclical (u_c): workers who loose their jobs due to recession.

- Natural rate of unemployment

Inflation, Economic growth and Unemployment

The business cycle

- The figure shows the recent cycles in real GDP.
- Recessions began in mid-1990 and in first quarter of 2001.
- The longest expansion in U.S. history ran from the March 1991 to March 2001.
- When GDP decreased in the recession (a),
- As real GDP increased back toward potential GDP, the unemployment rate fell toward the natural unemployment rate and the inflation rate fell.



Unemployment rate

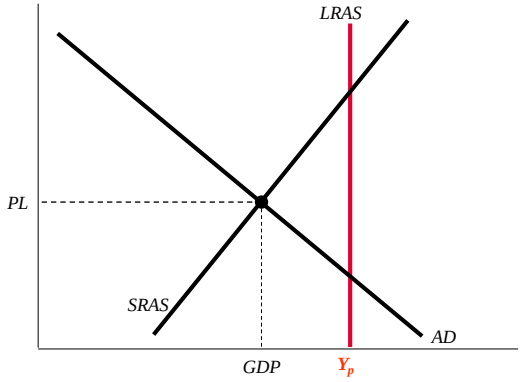
Changes in unemployment

- Unemployment depends on the difference between real GDP and potential GDP
- Potential GDP is the level of real GDP that the economy would have produced if its labor and capital were fully employed.
  - Full employment occurs when real GDP = potential GDP
  - Graphically, it is a vertical line in the AD-AS model
    - The real wage rate makes the quantity of labor demanded equal to the quantity of labor supplied.
    - Along the potential GDP line, when the price level changes the money wage rate changes to keep the real wage rate at the full-employment level.
  - When the economy grows more slowly than its potential, it fails to generate new jobs for its ever growing labor force
  - When the economy grows faster than its potential, the unemployment rate falls.
  - Full employment is reached when $u_c =$ which implies u

Inflation, Economic growth and Unemployment

Recessionary Gap

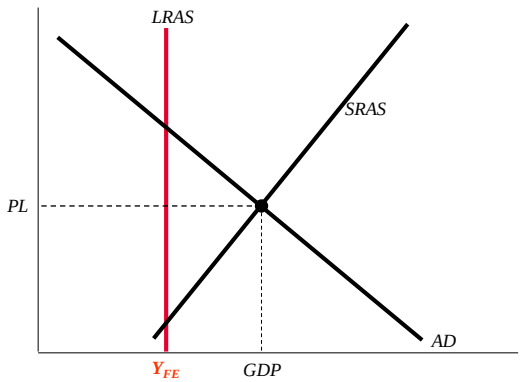
A recessionary gap occurs when GDP is less than potential GDP.
Resources, capital, and workers are not being fully utilized, and so *u* is high.
As a result, there is downward pressure on wages



Inflation, Economic growth and Unemployment

Inflationary Gap

An inflationary gap occurs when GDP exceeds potential GDP.
Workers are working overtime and firms are competing for their labor, resulting in low *u*
As a result, there is upward pressure on wages



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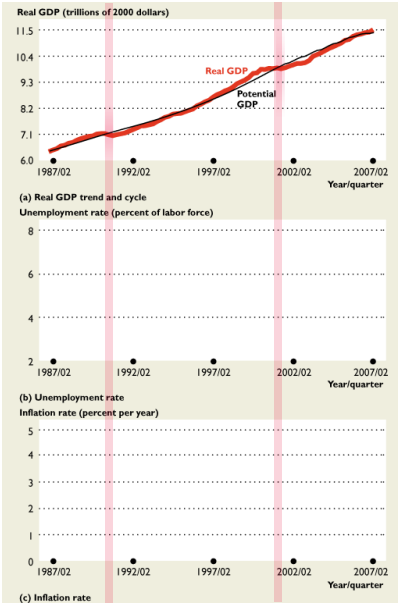
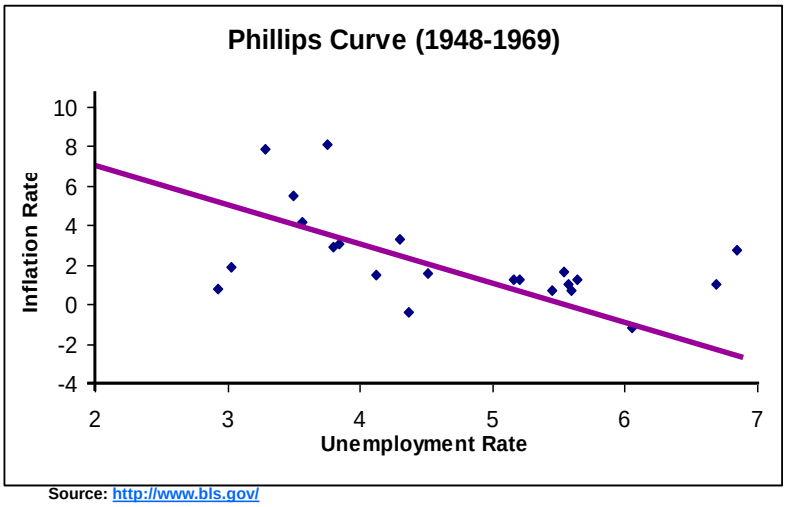
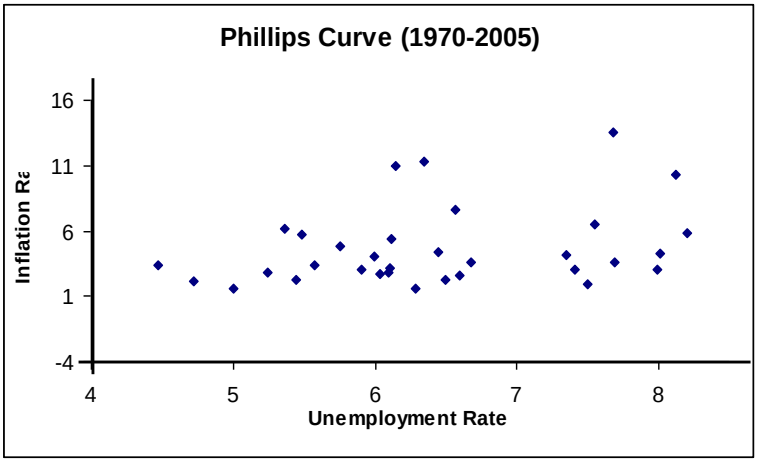


Inflation, Economic growth and Unemployment



Source: http://www.bls.gov/

Inflation, Economic growth and Unemployment



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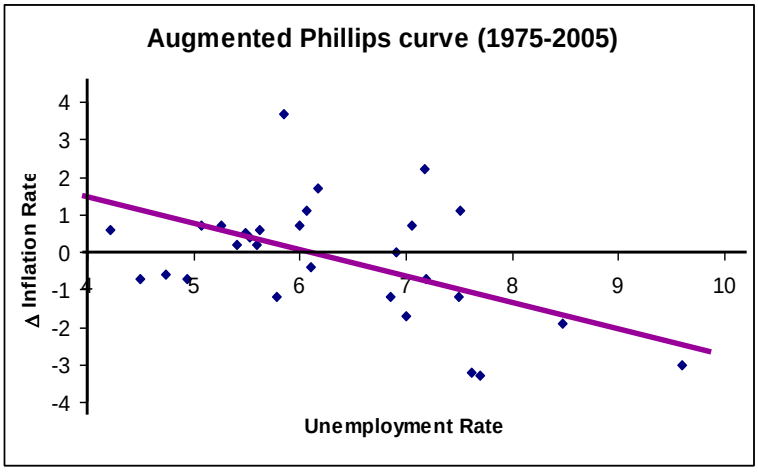

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