ECON 1 – Section 14

Measuring Price Level and Inflation

Contact Details

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- Handouts (only sections 104 & 133) after class in: http://www.ocf.berkeley.edu/~jaychen/econ1/
  - Please read: **Read before downloading!**.

Section 14 Agenda

- **Administrative Stuff (1 min).**
- **Recap Quiz (3 min)**
- **Problem 18.5 (10 min).**
- **Extra Exercise (10 min).**
- **Problem 19.3 (10 min).**
- **Problem 19.9 (10 min).**
- **Problem 19.10 (5 min).**
- **Re-cap (aprox 5 min, let's see).**

Administrative Stuff

- Remember: **PS#3 available today in Econ-1 Website.**
- Due next Monday October 28th.
- Solutions for Midterm Exam available in Econ-1 Website.

Review of Last Lecture - 10/16th

- Chapter 18:
  - GDP as imperfect measure of well-being
  - Participation rate. Cost of unemployment.
- Chapter 19:
  - Consumer price index (CPI).
  - Rate of inflation/deflation.
  - Nominal versus real.
  - Fisher Effect.

Important to remember:

- **Gross Domestic Product (GDP):**
  - The market value of the final goods and services produced in a country during a given period.

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

Recap Quiz - 1

- The consumer price index measures which of the following?
  1) inflation
  2) the average price level
  3) the cost of living
  4) deflation
  5) all of the above ✓

Recap Quiz - 2

- A nominal quantity is:
  1) adjusted for inflation.
  2) measured in terms of its current dollar value. ✓
  3) measured in physical terms.
  4) deflated.
  5) measured in terms of purchasing power

Recap Quiz - 3

- The wage paid to workers measured in terms of purchasing power is the:
  1) real wage ✓
  2) nominal wage.
  3) current wage.
  4) dollar wage.
  5) market wage

Recap Quiz - 4

- When inflation increases, which of the following will decrease?
  1) The real interest rate ✓
  2) The nominal interest rate
  3) The nominal rate of return
  4) The nominal wage rate
  5) The price level

Problem 18.5 (F&B page 480)

- Here are some data for an economy.

Consumption expenditures	**$600**
Exports	**75**
Government purchases of goods and services	**200**
Construction of new homes and apartments	**100**
Sales of existing homes and apartments	**200**
Imports	**50**
Beginning-of-year inventory stocks	**100**
End-of-year inventory stocks	**125**
Business fixed investment	**100**
Government payments to retirees	**100**
Household purchases of durable goods	**150**

Problem 18.5 (cont'd)

- First remember: $Y = C + I + G + NX$
- Where:
  - C = Consumption = spending by households
    - Consumer durables
    - Consumer non durables
    - Services
  - I = Investment = spending by firms
    - Business fixed investment (capital goods)
    - Residential investment (new homes and apartments)
    - Inventory Investment
  - G = Government Purchases
    - Not include transfers or interest on government debt
  - NX = Net Exports = Exports - Imports

Problem 18.5 (cont'd)

- Let's classify the different components:

CONCEPT	$	Y=C+I+G+NX
Consumption expenditures	$600	C
Exports	75	X
Government purchases of goods and services	200	G
Construction of new homes and apartments	100	Part of I
Sales of existing homes and apartments	200	Not counted on GDP
Imports	50	M
Beginning-of-year inventory stocks	100	Δ of Inventory is part of I
End-of-year inventory stocks	125	
Business fixed investment	100	Part of I
Government payments to retirees	100	Not counted on GDP
Household purchases of durable goods	150	Included in C

Problem 18.5 (Conclusion)

- So finally:
  - C = 600
  - I = 100 + (125-100) + 100 = 225
  - G = 200
  - NX = X-M = 75 – 50 = 25
- **Y = 600 + 225 + 200 + 25 = $1050**

Extra Exercise

Which of the following would or would not be included in the calculation of the current year's GDP? Why?

- A) The purchase of a 1990 Ford Bronco.
- B) A purchase of a share of IBM stock.
- C) Steel purchased by General Motors.
- D) A dry cleaning bill.
- E) The money you saved by doing your own laundry rather than using a dry cleaning service.
- F) $25 paid to a neighborhood kid to mow your lawn.
- G) $25 if you mow your lawn yourself.
- H) Money used to purchase marijuana.

Extra Exercise (2)

- Now, try to do it by yourselves!!!!
- You have 4 minutes to have an answer.
- Write it down and we'll go over all the answers.
- You have to take a side!!!!

Extra exercise (3)

- A) The purchase of a 1990 Ford Bronco.
  - No - it was produced in 1990, not the current year.
- B) A purchase of a share of IBM stock.
  - No - stock represents ownership, not production (see F&B page 463).
- C) Steel purchased by General Motors.
  - No - it is an intermediate good.
- D) A dry cleaning bill.
  - Yes.

Extra exercise (4)

- E) The money you saved by doing your own laundry rather than using a dry cleaning service.
  - No - there was no market transaction.
- F) $25 paid to a neighborhood kid to mow your lawn.
  - Yes.
- G) $25 if you mow your lawn yourself.
  - No - there was no market transaction
- H) Money used to purchase marijuana.
  - No - illegal production is not included in GDP calculations.

Problem 19.3 (F&B page 506)

- According the US Census Bureau, nominal (median) income for a family of four in the US was:

Year	Income	Growth
1980	$24,332	
1985	$32,777	34,7%
1990	$41,451	26,5%
1997	$53,350	28,7%

- In purchasing power, how did family income compare in each of those 4 years?

Problem 19.3 (cont'd)

- Remember **CPI (Consumer Price Index)**: 'd)

Problem 19.9 (cont'd)

- Remember:
  - **Market Interest Rate is nominal:** annual percentage increase in nominal value of a financial asset.
  - **Real interest rate:** Equals nominal interest rate minus inflation rate.
  - r = real interest rate
  - i = nominal, market, interest rate
  - π = inflation rate

$$r = i - \pi$$

Problem 19.9 (cont'd)

- **Rate of inflation** is annual percentage rate of change in price level, as measured, for example, by the CPI.

$$\pi(\%) = \frac{(\text{CPI}_1 - \text{CPI}_0)}{\text{CPI}_0} * 100$$

Problem 19.9 (cont'd)

- First we have to find the inflation rate:

Year	CPI	π
2000	100	
2001	105	5%
2002	110	4,8%
2003	118	7,3%

- Also, real return equals the nominal interest rate minus the inflation rate (r = i - π).
- Data from the problem i = 6%.

Problem 19.9 (cont'd)

- So the real interest rate in each year will be:

Year	CPI	π	r
2000	100		
2001	105	5%	1%
2002	110	4,8%	1,2%
2003	118	7,3%	-1,3%

- What is the total real return over the 3-year period?

Problem 19.9 (cont'd)

- Remember: Investing at year 0 a certain amount C, at an annual interest rate r, during a time t:
  - Year 0 ⇨ C_0
  - Year 1 ⇨ $C_1 = C_0*(1+r)$
  - Year 2 ⇨ $C_2 = C_1*(1+r) = C_0*(1+r)^2$
  - Year t ⇨ $C_t = C_{t-1}*(1+r) = C_0*(1+r)^t$
- Total return on investment:

$$ROI\% = \frac{(C_t - C_0)}{C_0} * 100$$

Problem 19.9 (Conclusion)

- Now, let's see Albert's investment return from the original $1,000 @ 6% nominal interest rate:

Year	CPI	C
2000	100	$1,000
2001	105	$1,060
2002	110	$1,123.6
2003	118	$1,191.02

- Total ROI = (1,192-1,000)/1,000 = 19.2%
- But CPI rose = (118-100)/100 = 18%
- So REAL return = 19.2-18 = 1.2%

Problem 19.10 (F&B page 508)

- Frank is lending $1,000 to Sarah for 2 years.
- Both agree that Frank should earn a 2% real return per year.
  - A) The CPI (multiplied by 100) is 100 at the time that Frank makes the loan. It is expected to be 110 in 1 year and 121 in 2 years.
  - What nominal rate of interest should Frank charge Sarah?

Problem 19.10 (cont'd)

- What is the expected inflation?
  - First year: (110-100)/100 = 10%
  - Second year: (121-110)/110 = 10%
- Remember: **$r = i - \pi$**
- If Frank charges Sarah a 12% nominal interest rate, he will earn a real return of 2% per year (12% nominal interest rate – 10% inflation rate).

Problem 19.10 (cont'd)

- B) Suppose Frank and Sarah are unsure about what the CPI will be in two years. How could they index Sarah's annual repayments to ensure that Frank gets an annual 2% real rate of return?
  - To ensure a 2% annual return on the loan, Frank and Sarah should agree that Sarah will pay an interest rate in each year equal to 2% plus whatever the inflation rate turns out to be.
  - For example, if inflation turns out to be 8% during the first year and 10% during the second year, Sarah should pay 10% nominal interest in the first year and 12% in the second year.

Problem 19.7 (F&B page 507)

- Prices for gasoline from 1978 to 1986 together with CPI.

Year	Gasoline ($/gallon)	CPI (1982-84=1.0)
1978	0.633	0.652
1979	0.901	0.726
1980	1.269	0.824
1981	1.391	0.909
1982	1.309	0.965
1983	1.277	0.996
1984	1.229	1.039
1985	1.241	1.076
1986	0.955	1.136
1978	0.633	0.652

Problem 19.7 (cont'd)

- Work with the data and say if the changes in gas prices during this period were due to general inflation, or if the were factors specific to the oil market playing a role as well.
- Ops, we don't have time to go through it!!!!
- Why don't you do it at home ?
- Have enough to do? Come on!!!!
- YOU NEED MORE!!!!

Problems for next sections !!!

- So here you have…
- This is a new part of the class.
- I'll tell you the problems that I'll do in next sections and you can try to do them at home.
- I'll do most of them but not promise to go through all.
- For next sections:
  - **Chapter 20: 1, 3, 4 & 8.**
  - **Chapter 22: 2, 3, 5 & 9.**
- Remember: This is not mandatory. It won't be graded. Only for those of you that need improvement in Exam grades (actually more than "some" of you).

Next class

- Next Class:
  - Section 15 – Wednesday, Oct 23rd.
  - Work on PS#3 (ready in Econ-1 website), due next Monday !!!.
  - If you want more practice, work on Next Sections Problems.
  - Read ch. 20 & 22.
  - You can download handouts this afternoon.
  - Thank you for coming on time !!!
- C-U Wednesday !!.