

## Problem Set #8: MONITORING ECONOMIC PERFORMANCE

Preparation: Be sure to read Ch. 8, "Monitoring Economic Performance," before attempting this problem set.

Readings: Econ 00/01, #30: Louis Uchitelle, "Learning from the Big Booms"

Federal Reserve Bank of San Francisco Economic Letter, Allison Wallace and Brian Motley, "A Better CPI," Feb 5, 1999 & J. Bradford Delong "How Fast is Modern Economic Growth?" October 16, 1998 (On the assignment home page or download from <http://www.sf.frb.org/econsrch/wklyltr/index.html>).

Federal Reserve Bank of St. Louis, National Economic Trends, November 1999, "Putting Business Software Purchases into the National Accounts." <http://www.stls.frb.org/publications/net/>

**Purpose:** This problem set provides an introduction to the nitty-gritty definitional and accounting details of macro economic indicators, focusing on the problems of measuring the level of unemployment and the rate of inflation.

### Part A: UNEMPLOYMENT AND THE GDP GAP

- Use Okun's Law to complete the second line of the table:

U	5%	6%	7.5%	8.5%	10%	12%
GDPgap%	-0.25%	_____	6%	_____	12.25%	_____

- In 1982, when the civilian unemployment rate averaged 9.5%, GDP totaled \$3,166 Billion.
- Estimate, using Okun's Law, the potential level of GDP that the economy might have produced if it has been operating with 5.1% instead of 9.5% unemployment.
- Many economists argue that aiming for 5.1% unemployment would cause excessive inflation. Calculate the GDPgap% and Potential GDP for 1982, when unemployment was 9.5%, assuming that 6% is the full-employment-unemployment rate.
- When Okun developed his relationship in the early 1960s, the Council of Economic Advisers had announced an interim full-employment target of 4%. Recompute the GDPgap% and potential GDP for 1982 under the assumption that 4% is the full-employment unemployment rate.

Table 2: The Labor Force (Data Seasonally Adjusted, age 16 and over)

	Dec 1982	Dec 1986	Dec 1999
Civilian Non-institutional Population	173,199	181,547	208.832
Civilian Labor Force	110,962	118,586	_____
Employed	99,055	_____	134,420
Unemployed	_____	7,949	6,021
Unemployment Rate	10.7	_____%	_____%
Employ/Population Ratio	_____%	60.9%	_____%
Labor Force Participation Rate	64.1%	65.3%	_____%
Resident Armed Forces (RAF)	1,665	_____	
Total Labor Force (including RAF)	112,627	_____	
Employment, including RAF	100,720	112,387	
Unemployment Rate (inc RAF)	10.6%	_____%	
Labor Force Participation Rate (inc RAF)	_____%	65.7%	

Source: Bureau of Labor Statistics

3. Verify that you have mastered the key unemployment concepts and demonstrate your numerical skills by *calculating* the missing numbers on Table 2 (Don't guess; don't look up the numbers; just use your pocket calculator). Observe that one way to make the official unemployment rate look lower is to include members of the armed forces who reside inside the United States.

### Part B: INFLATION ARITHMETIC

4. Consider the price information reported on Table 3 about the nominal and real wages of army recruits.

Year	Monthly pay	Consumer Price Index		Real Monthly Wage of Private E1	
		(1982-84=100)	(1997=100)	1982-84 dollars	1997 dollars
1963	\$78	30.6	_____	\$255	_____
1973	\$326	_____	_____	\$734	_____
1978	_____	95.4	_____	\$609	_____
1987	\$658	113.6	_____	\$579	_____
1989	\$699	124.9	_____	\$560	_____
1997	\$900	160.5	100	_____	\$900

Source: *Statistical Abstract of the United States & the World Almanac*

- a. Use your calculator to fill in the blanks on Table 3, except for the two 1997 columns.
  - b. Fill in the price index for 1997 = 100 [Hint: multiply by the appropriate conversion factor]; then recalculate the real monthly wage of a private E1 measured in terms of dollars of 1997 purchasing power.
5. When Mr. Jones Sr. purchased a home for his family in 1970, he took out a 25 year \$30,000 mortgage at 6% interest, making monthly payments of \$193. When Jones Jr. purchased a home for his family in 1985 he took out a \$90,000 mortgage at 14%, making monthly payments of \$1,067 for 30 years. [You can answer the following two questions using the approximation  $\bar{r} = r - \dot{p}$ ].
- a. What is the difference between the *ex ante* real rates of interest paid by Jones Sr. and that paid by Jones Jr., assuming that inflation was not anticipated in 1965 while 10% inflation was anticipated in 1985.
  - b. By how much would the *ex post* real rate of interest paid by Jones Jr. have exceeded that of Jones Sr. from 1985 to 1995, if the annual rate of inflation had turned out to be 10%. How much higher would the *ex post* real rate of interest paid by Jones Jr. from 1985 through 1995 have been if the inflation rate had turned out to be 5%?
- Optional:* Find out from the newspaper or the Internet the current mortgage interest rate; then calculate your monthly payment on a \$200,000 mortgage running for 30 year.
6. World War II: In 1943 Kate Smith's singing of "Praise the Lord and Pass the Ammunition" encouraged Rosie the Riveter to spend \$37.50 for a \$50 "War Bond"; this would help pay for a hand grenade for the soldiers in Imo Jima. She was promised \$50.00 when the bond matured ten years later; that is to say, she would receive a lump sum interest payment of \$12.50 on maturity. (Today we would call this a "zero coupon bond")
- a. In 1943 the CPI stood at 41.8 (1967=100); in 1953 the CPI had climbed to 80.1. Calculate the annual rate of inflation over this 10 year period. How much would Rosie have had to receive in 1953 in order to have the same purchasing power as she had when she lent the \$37.50 to Uncle Sam ten years earlier?
  - b. What nominal rate of interest (compounded annually) did she receive on her savings? What was the real (*ex post*) rate of interest?