

Homework #1
Due January 22, 2004

Answer all questions on these sheets, adding extra sheets if necessary.

1. a) The following is a list of transactions and events that occurred, unless otherwise indicated, in 2003 and in the United States. All companies and individuals are U.S. residents and citizens unless indicated otherwise by their name or other identifier. For each one, indicate whether or not it contributed to one or more of the U.S. macroeconomic variables C, I, G, EX, or IM for 2003, and if so, which one or ones. Record your answer by writing either "none" or $x=\pm yyy$ in the space provided, where $x=C,I,G,EX,$ or IM and yyy is the dollar amount. (Note: $EX=$ exports and $IM=$ imports, so that net exports $NX=EX-IM$.) The first one is done for you as an example.

Priya Naik buys a pizza for \$10	<u>C=+10</u>
Priya Naik makes her own pizza using materials she has on hand	<u>none</u>
Boeing manufactures a new jet and sells it to British Airways for \$1,200,000	<u>EX=+1,200,000</u>
Boeing manufactures a new jet and sells it to Northwest Airlines (a US company) for \$1,200,000	<u>I=+1,200,000</u>
The U.S. Social Security Administration pays \$840 in retirement benefits to Dwight Deardorff, a retiree in Iowa.	<u>none</u>
John Chamberlin buys a Sony Playstation for his nephew, spending \$150 at Meijers, which sells it to him out of its inventory.	<u>C=+150</u> <u>I=-150</u>
Having played it, John buys another Sony Playstation for himself, for \$200 directly from Sony in Japan, because local stores are sold out.	<u>C=+200</u> <u>IM=+200</u>
New faculty member Dean Yang buys a house from a departing physics professor for \$220,000.	<u>None</u>
Edmund Salty, a Detroit carpenter, is paid \$300 for installing a stained glass window in a 30-year-old home in Gross Pointe, MI.	<u>C=+300</u>
The same Edmund Salty is paid \$300 for installing a stained glass window in a Detroit restaurant.	<u>I=+300</u>

Edmund Salty, again, is paid CA\$500 for installing a window in a home in Windsor, Canada. (CA\$1=US\$0.70 at the time.)	None or EX=+\$350
Carl Simon is paid \$1500 by the U.S. government for giving five lectures (on calculus?) in the White House.	G=+1500
The Brown Jug restaurant uses \$2 of materials from its inventory to make a lunch that it sells for \$6.	I=-2 C=+6
Justin McCrary pays \$3000 for 100 days of day care.	C=+3000
On Martin Luther King Day, Justin McCrary stays home and cares for his child himself.	None
The Ford Motor Co. manufactures a Ford Explorer during 2003, which it sells to Becky Blank for \$33,000 on Jan 5, 2004.	I=+33,000
The Microsoft Corporation and the U.S. Justice Department each spend \$180,000 to build two identical new warehouses to accommodate the documents from their antitrust case.	I=+180,000 G=+180,000
Jim Levinsohn (not his real name) spends \$100 on marijuana.	none
Jim Levinsohn (still not his real name) pays \$1000 to the City of Ann Arbor in bail.	None
Ann Arbor attorney Peter Darrow collects a fee of \$10,000 for defending an unnamed U of M faculty member on a drug charge.	C=+10,000
Alan Deardorff does nothing all year except live in his house and drive his car, both of which he owns. To rent equivalent housing would have cost him \$14,000, and to rent an equivalent car would have cost him \$1800.	C=+14,000

- b) If the transactions listed above were all that happened in 2003, what would be the United States 2003 GDP? What would be its GNP?

$$\text{GDP} = \$2,822,114 \text{ or } \$2,822,464$$

$$\text{GNP} = \$2,822,464$$

2. The following table gives prices paid and quantities produced of five goods in three years for a hypothetical economy, plus a representative consumption basket for a typical consumer. Assuming that these are the only goods consumed and produced in this economy, calculate the various economic indicators indicated below. For all calculations for which a base year is needed, let the base year be 1990. (For a chance at part credit, in case you mess up the calculations, express your result first as a formula.)

Good	Quantity in CPI Basket	1990 Quantity	1990 Price	1994 Quantity	1994 Price	1995 Quantity	1995 Price
Pop	10	450	\$2.00	500	\$2.10	600	\$2.10
Coffee	15	800	\$3.00	1000	\$4.00	900	\$5.00
Pizza	5	200	\$15.00	240	\$15.00	300	\$14.00
Housing	1	50	\$105	55	\$110	60	\$115
Police	0	2	\$2000	2	\$2100	2	\$2100

- a) Nominal 1994 GDP Ans: $NGDP_{94} = \sum P_{94} * Q_{94} = \$18,900$
- b) Real 1994 GDP Ans: $RGDP_{94} = 94 \text{ GDP in } 1990 \text{ prices} = \sum P_{90} * Q_{94} = \$17,375$
- c) The GDP Deflator for 1994 Ans: $Def_{94} = 100 * NGDP_{94} / RGDP_{94} = 108.78$
- d) The GDP Deflator for 1995 Ans: $Def_{95} = 100 * \sum P_{95} * Q_{95} / \sum P_{90} * Q_{95} = 112.62$
- e) The rate of inflation from 1994 to 1995 according to the GDP Deflator Ans: $InfDef_{95} = Def_{95} - Def_{94} / Def_{94} = 3.53\%$
- f) The CPI for 1994 Ans: $CPI_{94} = 100 * \sum P_{94} * Q_{basket} / \sum P_{90} * Q_{basket} = 108.57$
- g) The CPI for 1995 Ans: $CPI_{95} = 100 * \sum P_{95} * Q_{basket} / \sum P_{90} * Q_{basket} = 114.69$
- h) The rate of inflation from 1994 to 1995 according to the CPI Ans: $InfCPI_{95} = CPI_{95} - CPI_{94} / CPI_{94} = 5.64\%$

3. Use data that you obtain from the Bureau of Labor Statistics (see links to the BLS on the course home page) to check the accuracy of Mankiw's (p. 24) "tricks" for working with percentage changes, as follows:

a) Look up in the BLS the civilian labor force and level of civilian employment in December 2002 and December 2003, and record them below:

		Dec 2002	Dec 2003
LF:	Labor Force	145.157 m.	146.878 m.
E:	Employment	136.459 m.	138.479 m.

b) Calculate level of unemployment and the actual unemployment rate for the two months. (Carry out calculations to at least 4 significant digits.)

$U = LF - E:$	Unemployment	8.698 m.	8.399 m.
$UR = U / LF:$	Unemp. Rate	5.992%	5.718%

c) Calculate the percentage changes in the labor force and unemployment from Dec 2002 to Dec 2003, and record them below:

$(LF03 - LF02)/LF02:$	%Δ Labor Force	+1.186%
$(U03 - U02)/U02:$	%Δ Unemployment	-3.438%

- d) Estimate, using one of Mankiw's tricks, the percentage change in the unemployment rate and, from that, the estimated Dec 2003 unemployment rate:

$\% \Delta UR = \% \Delta U - \% \Delta LF$	$\% \Delta \text{Unemp Rate}$	-4.624%
$UR_{02} * (1 + \% \Delta UR)$	Est. Unemp Rate	5.715%

- e) By how much has using Mankiw's trick missed the actual unemployment rate?

Ans: The trick missed by $5.718 - 5.715 = 0.003$ percentage points, or by $0.003 / 5.718 = 0.05\%$.

4. (Optional) When unemployment is high, the unemployment rate likely understates the number of people who would like to work and can't, because some of them become discouraged and do not look for work. They are then classified as "not in the labor force." With today's high unemployment rates, one might expect the number of these discouraged workers to have risen, and therefore that the "not in the labor force" group would be getting larger. Is it? That is, using the Bureau of Labor Statistics Current Population Survey, find out whether the number of people "not in the labor force" was rising in the most recent years available, and also how many of these people reported their reason for not searching for work as "discouragement over job prospects."

Ans: One source for these data is table 35 at <http://stats.bls.gov/cps/home.htm#pnlfl>. It reports the number not in the labor force as rising from 71.359 m. to 72.707 m. from 2001 to 2002 (which is the most recent year reported there). It also reports the number "discouraged" as rising from 321,000 to 369,000. The former is an increase of 1.89%, while the latter is an increase of 14.95%, suggesting that, indeed, the proportion of discouraged workers rose from 2001 to 2002.