

Answers to Problem Set #1

1a. Strategy: Solve for the reduced form for Y then solve for Yd

1c.		<u>Type of equation</u>
(1)	$E = C + I + G$	identity
(2)	$C = 100 + .8*Yd$	behavioral
(3)	$Yd = Y - T$	identity
(4)	$T = .25*Y$	identity
(5)	$Y = E$	equilibrium

Plug (4) into (3), then (3) into (2) and then (2) into (1), and finally, (5) into (1).

$$\begin{aligned}
 Yd &= Y - .25*Y \\
 C &= 100 + .8*[Y - .25*Y] \\
 E &= 100 + .8*[Y - .25*Y] + I + G \\
 Y &= 100 + .8*[Y - .25*Y] + I + G
 \end{aligned}$$

Now, solve for Y by moving all terms that include Y to the left hand side and then divide through by the coefficient of Y.

$$\begin{aligned}
 Y - .6*Y &= .4*Y = 100 + I + G \\
 Y &= 250 + 2.5*I + 2.5*G - \text{the reduced form for both Y and E}
 \end{aligned}$$

Thus,  $Yd = .75*Y = 187.5 + 1.875*I + 1.875*G$  is the reduced form equation for Yd.

b. The equilibrium value for Yd, given the values for I and G, = 825.

d. To determine the equilibrium deficit, first compute T and then G - T.

$$\begin{aligned}
 \text{From a and b, } Y &= Yd/.75 = 1100; \text{ thus, } T = .25*Y = 275 \\
 \text{For } G &= 200, G - T = -75, \text{ a surplus.}
 \end{aligned}$$

2a. Growth in the economy can be computed using either 2002 or 2012 prices

i) using 2002 prices

$$Q(12) = EP(i,02)*Q(i,12) = 970$$

$$Q(02) = EP(i,02)*Q(i,02) = 675$$

so output grew by  $[(970-675)/675]*100 = 43.7\%$

ii) using 2012 prices - P(i,10)

$$Q(12) = 1120; Q(02) = 800; \text{ so output grew by } 40\%$$

- 2b. One can use either 2002 or 2012 quantities
- i) using 2002 quantities  
 $P(12) = 800$ ;  $P(02) = 675$ ; so prices grew by 18.5%
  - ii) using 2012 quantities  
 $P(12) = 1120$ ;  $P(02) = 970$ ; so prices grew by 15.5%
- 2c. Obviously, the answers are not unique. A chain index would indicate that the growth rate for output would be  $\text{SQRT}(1.437*1.40) - 1 = .418$  or 41.8% and prices grow at  $\text{SQRT}(1.185*1.155) - 1 = .170$  or 17.0%.
3. The connection between budget and trade deficits can be expressed by the "sources = uses" of income balance condition.

$$C + I + G + eX = C + S + T + \text{Im} \text{ that can be rearranged to yield}$$

$$(I - S) + (G - T) = \text{Im} - eX$$

For  $I = S$ , a budget deficit implies a trade deficit which requires the flow of foreign capital into the domestic country. If  $I$  is much less than  $S$ , then the signs (positive or negative) are likely to differ for the two accounts, characteristic of the Japanese economy. If  $I$  is much greater than  $S$ , small deficits or surpluses in the government account could exist along with a trade deficit. If  $I$  is similar to  $S$ , the signs of the two deficits (trade and budget) would be the same.

4. The six different measures of unemployment reflect a range of possible representations of hardship (U1) on the one hand to all individuals who could potentially be available to work additional amounts (U6), on the other. There is no one way to view these data. Which is appropriate depends upon the kind of question asked. One may also wish to relate each measure to the key conceptual distinctions regarding the types of unemployment: frictional, structural, and cyclical. U1 is likely to reflect structural effects. U2 -U6 contain frictional, structural and cyclical components.
5. See Chapter 1 and 2 of the 2013 Annual Report of the CEA for the outlook for the U.S. economy. Pay particular attention to pages 72-88.