Consumption Function, Aggregate Expenditures and Investment [1]
In-Class Problem[2]

Let's assume we have an economy in which we observe the following values for consumption, investment, government spending, exports and imports:

- *$C = \$2{,}000$ billion ($2 trillion)*
- *$I = \$1{,}000$ billion ($1 trillion)*
- *G, X and IM each = $0*
- *$MPC = .8$*

1. **What is the level of GDP?**

   $$GDP = C + I + G + X - IM = \$2{,}000 + \$1{,}000 + \ 0 = \$3{,}000\ billion = \$3\ trilllion \quad (1)$$

2. **If there is some initial level of consumption equal to $100 billion, what is Y_D (disposable income)?**

   We know that $C = a + MPC(Y_D)$ and $a = \$100$ *(some initial level)*, so we can substitute in the values we have and solve for Y_D

   $\$2{,}000 = \$100 + (.8)(Y_D)$
   $\$1{,}900 = (.8)(Y_D)$
   $Y_D = \$2{,}375$ billion

3. **If consumption in a prior period was valued at $1,950 billion, what would that tell us about disposable income in that same period?**

   We know that $\frac{\Delta C}{\Delta Y_D} = MPC$, and since we have values for ΔC and MPC we can solve for ΔY_D

   $$\frac{\Delta C}{\Delta Y_D} = MPC$$

   $$\frac{\$2{,}000 - 1950}{\Delta Y_D} = .8$$

[1] This In-Class Problem is intended to present an abbreviated discussion of the included economic concepts and is not intended to be a full or complete representation of them or the underlying economic foundations from which they are built.

[2] This problem was developed by Rick Haskell (rick.haskell@utah.edu), Ph.D. Student, Department of Economics, College of Social and Behavioral Sciences, The University of Utah, Salt Lake City, Utah (2014).

$\Delta Y_D = \frac{\$50}{.8}$ = $62.5 billion

Since we know that Y_D in the current period is $2,375 billion, we now know that Y_D in the prior period must have been $2,312.5 ($2,375 - $62.5 = $2,312.5)

4. **If inventories unexpectedly grew by $150 billion between the two periods, what would be the level of planned aggregate expenditures, AE_P?**

   We think about an unexpected (unplanned) change in inventory as being unplanned investment or (I_U)

   Recall that

   $I = I_P + I_U$ so $I_P = I - I_U$

   Now substitute in values that we know

   $\$1{,}000 - \$150 = \$850 = I_P$

   $AE_P = C + I_P$

   Substitute in known values

   $AE_P = \$2{,}000 + \$850 = \$2{,}850$

5. **Let's assume that investment in the prior period was equal to 95% of the planned investment in this period, what does this tell us about GDP in the prior period?**

   Recall that $\Delta GDP = \Delta C + \Delta I$

   We know that $\Delta C = \$2{,}000 - \$1{,}950 = \$50$

   And we're told above that the prior period I_P is 95% of this period's I_P, which we calculated at $850 billion, so $\Delta I_P = .05 * \$850 = \$42.50$ and ΔI_U = 150 which tells us that ΔI = $192.50

   So we know that $\Delta GDP = \Delta C + \Delta I = \$50 + \$192.50 = \$242.50$

   And that tells us that GDP in the prior period was $100 less than it is in this period so

   $GDP_{prior} = GDP - \$3{,}000 - \$242.50 = \$2{,}757.50$