Course in Macroeconomics and Global Economics
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Solution to Practice 1

Exercise 1

1. GDP "*production of final goods approach*" = €1,000,000

2. Value added at the first stage of production, by the mining company = €300,000
   Value added at the second stage of production, by the jewellery manufacturer = €700,000
   (€1.000.000 in sales revenues - €300.000 in intermediate goods)
   GDP "*value added approach*" = €1,000,000

3. Total Wages = €450,000
   Total Profits = €550,000
   GDP "*income approach*" = €1,000,000 (wages + profit)

Exercise 2

1. Nominal GDP in 2006 = €25,000
   Nominal GDP in 2007 = €40,000
   Percentage change in nominal GDP = 60% $\frac{€Y_t - €Y_{t-1}}{€Y_{t-1}}$

2. Real GDP in 2006 (with 2006 prices) = €25,000
   Real GDP in 2007 (with 2006 prices) = €31,000
   Percentage change in real GDP = 24% $\frac{€Y_t - €Y_{t-1}}{€Y_{t-1}}$

3. Real GDP in 2006 (with 2007 prices) = €33,000
   Real GDP in 2007 (with 2007 prices) = €40,000
   Percentage change in real GDP = 21% $\frac{€Y_t - €Y_{t-1}}{€Y_{t-1}}$

Exercise 3

1. $Y = C + I + G$
   $Y = 180 + 0.8Y_D + 160 + 160$
   $Y = 180 + 0.8(Y - T) + 160 + 160$
   $Y = 180 + 0.8(Y - 120) + 160 + 160$
   $Y - 0.8Y = 180 - (0.8 * 120) + 160 + 160$
   $Y = \frac{1}{1-0.8}(180 - 96 + 160 + 160) =$
   $Y = 5 \times 404 = 2020$

   $Y_D = Y - T$
   $Y_D = 2020 - 120 = 1900$

   $C = 180 + (0.8 \times 1900) = 1700$

2. Multiplier of autonomous spending = 5

3. Private Saving: $Y_D - C$ = 1900-1700=200
   Public Saving (Budget Surplus): $T - G$ = 120-160= -40
   The sum if the public and private saving is equal to 160, which is equal to the investment since in equilibrium we have that $S = I$.

Exercise 4

1. New level of public spending $G = 160 + 40 = 200$
   Now compute output variation

   The new level of output will be

   $Y = 180 + 0.8(Y - 120) + 160 + (160 + 40)$

   $Y\,(1 - 0.8) = 180 - 96 + 160 + 200$

   $Y = \frac{444}{1-0.8} = 2220$

   therefore

   $\Delta Y = 200$, $\Delta G = 40$

   The fiscal multiplier $\frac{\Delta Y}{\Delta G} = \frac{200}{40} = 5$

   The initial level of output was in fact 2020, now it is 2220. Output variation $\Delta Y = 200$ is 5 times larger than the initial variation of public spending, $\Delta G = 40$.

   Remark: in this case in fact the fiscal multiplier is simply given by $\frac{1}{1-0.8} = 5$

2. The new level of output will be

   $Y = 180 + 0.8(Y - 120 - 40) + 160 + (160 + 40)$

   $Y\,(1 - 0.8) = 180 - 128 + 160 + 200 = 412$

   $Y = \frac{412}{1-0.8} = 2060$

   therefore

$\Delta Y = 40$, $\Delta G = 40$

The fiscal multiplier $\frac{\Delta Y}{\Delta G}$=1

The fiscal multiplier is now equal to 1: the initial level of output was in fact 2020, now it is 2060. Output variation $\Delta Y = 40$ is equal to the initial variation of public spending, $\Delta G = 40$.

The fiscal expansion is financed by an increase in taxes, therefore the fiscal multiplier is equal to 1 (the so called "budget balance multiplier").