Student ID.....

EE312 Macroeconomics, 1/2015 (Sec. 046402)

Problem Sets 1 : Ch.1 Introduction and Ch 2. Measurement

1. Find the latest statistical GDP and GNP data for Thailand from NESDB (Office of The National Economics and Development Board) website. Fill in the blanks below.

   CVM (total) GDP in 2013p (preliminary) = ...9,154,247.. million Baht

   CVM Agriculture GDP in 2013p (preliminary) = ...662,643..... million Baht

   CVM Non-Agriculture GDP in 2013p (preliminary) = ... 8,521,964..... million Baht.

   Does CVM Agriculture and CVM non-agriculture GDP add up to CVM GDP? ....N.....

   662,643 + 8,521,964 = 9,184,607.

   "Note : 1/ Chain volume series are not additive. The sum of the components will thus not be equal to the shown totals."

   * Gross domestic product **chain volume measures** (reference year = 2002)

2. Find the latest statistical GDP and GNP data for Thailand from NESDB (Office of The National Economics and Development Board) website. Fill in the blanks below.

   CVM (total) GDP in 2002 = ...5,769,578..... million Baht

   CVM Agriculture GDP in 2002 = ...501,725..... million Baht

   CVM Non-Agriculture GDP in 2002 = ...5,267,853.. million Baht.

   Does CVM Agriculture and CVM non-agriculture GDP add up to CVM GDP?...Y...

   * Gross domestic product **chain volume measures** (reference year = 2002)

3. Find the latest statistical GDP and GNP data for Thailand from NESDB (Office of The National Economics and Development Board) website. Fill in the blanks below.

   nominal GDP in 2013p (preliminary) = ...12,910,038.. million Baht

   nominal Agriculture GDP in 2013p (preliminary) = ...1,459,150..... million Baht

   nominal Non-Agriculture GDP in 2013p (preliminary) = ...11,450,888..... million Baht.

   Does nominal Agriculture and nominal non-agriculture GDP add up to nominal GDP?...Y...

   * Gross domestic product **at current market price** by economic activities

4. Exogenous variables and Endogenous variables. Consider a closed economy described by the following equations(DAE model);

   $$\begin{aligned} C &= c_0 + c_1 Y \\ I &= i_0 + i_1 Y \end{aligned}$$

   Equilibrium is defined where $Y = C + I$. At equilibrium, $Y = \dfrac{1}{(1 - c_1 - i_1)}(c_0 + i_0)$.

   (a) What are the exogenous variables in this model? (underline: C, I, Y, $\underline{c_0}$, $\underline{c_1}$, $\underline{i_0}$, $\underline{i_1}$).

   (b) What are the endogenous varibales in this model?(underline: $\underline{C}$, $\underline{I}$, $\underline{Y}$, c_0, c_1, i_0, i_1).

5. Consider the following economy that is producing onlygoods A (apples) and goods B (bananas). Prices and quantities for 2005 and 2013 are displayed in the following table:

Goods	2005			2013		
	P	Q	P_tQ_t	P	Q	P_tQ_t
A (Apples)	40	125	5,000	60	100	6,000
B(Bananas)	100	50	5,000	80	75	6,000
total			10,000			12,000

(a) Calculate the Nominal GDP, the Real GDP (using 2005 prices) and the GDP deflator in each year;s

2005 = base year

$$\begin{aligned} rGDP^{2005} &= \sum_i P_i^{2005} Q_i^{2005} \\ &= (..40.. \times ..125.) + (..100... \times ..50..) \\ &= ...10,000..... \end{aligned}$$

$$\begin{aligned} rGDP^{2013} &= \sum_i P_i^{2005..} Q_i^{...2013..} \\ &= (..40.. \times ...100..) + (...100... \times ...75....) \\ &= .....11,500..... \end{aligned}$$

$$\begin{aligned} GDP \text{ deflator}_{2005} &= \frac{\text{GDP}_{2005}}{\text{real GDP}_{2005}} \times 100 \\ &= ...100.... \end{aligned}$$

$$\begin{aligned} GDP \text{ deflator}_{2013} &= \frac{\text{GDP}_{2013}}{\text{real GDP}_{2013}} \times 100 \\ &= ...104.35.... \end{aligned}$$

(b) Calculate the Nominal GDP, the Real GDP (using 2013 prices) and the GDP deflator in each year;

2013 = base year

$$
\begin{aligned}
rGDP^{2005} &= \sum_i P_i^{..2013...} Q_i^{2005..} \\
&= (..60... \times ..125..) + (...80... \times ...50...) \\
&= ...11,500..... \\
rGDP^{2013} &= \sum_i P_i^{..2013.....} Q_i^{...2013...} \\
&= (...60... \times ..100...) + (...80.. \times ..75....) \\
&= ..12,000.... \\
GDP \text{ deflator}_{2005} &= \frac{\text{GDP}_{2005}}{\text{real GDP}_{2005.}} \times 100 \\
&= ....86.96..... \\
GDP \text{ deflator}_{2013} &= \frac{\text{GDP}_{2013}}{\text{real GDP}_{2013.}} \times 100 \\
&= ....100.....
\end{aligned}
$$

6. Chain-Volume-Measure GDP - CVM. Given the following information, calculate CVM GDP in 2009, 2010, 2011, 2012 and 2013. The base year is 2009. Show how to calculate.

t	GDP (2009's Price) $\sum_i P_{i,2009} Q_{i,t}$ unit: \$	GDP (2010's Price) $\sum_i P_{i,2010} Q_{i,t}$ unit: \$	GDP (2011's Price) $\sum_i P_{i,2011} Q_{i,t}$ unit: \$	GDP (2012's Price) $\sum_i P_{i,2012} Q_{i,t}$ unit: \$
2009	100	105	115	125
2010	104	110	120	130
2011	110	122	125	140
2012	120	130	145	160
2013	125	135	150	165

CVM GDP 2009 = nominal GDP 2009 = real GDP (2009's price) = ...100....

Direct Index (DI)

$$DI_{2010} = \frac{\sum_i P^{2009} \times Q^{2010.}}{\sum_i P^{2009} \times Q^{2009}} = ...\frac{104}{100}.....$$

$$DI_{2011} = \frac{\sum_i P^{2010} \times Q^{2011}}{\sum_i P^{2010} \times Q^{2010.}} = ...\frac{122}{110}....$$

$$DI_{2012} = \frac{\sum_i P^{2011} \times Q^{2012}}{\sum_i P^{2011} \times Q^{2011.}} = ...\frac{145}{125}...$$

$$DI_{2012} = \frac{\sum_i P^{2012} \times Q^{2013}}{\sum_i P^{2012} \times Q^{2012.}} = ...\frac{165}{160}...$$

Chain Index (CI)

$$CI_{2010} = ...DI_{2010} .....= ...\frac{104}{100}..$$

$$CI_{2011} = ...DI_{2010} \times DI_{2011} == .\frac{104}{100} \times \frac{122}{110}.....$$

$$CI_{2012} = ...DI_{2010} \times DI_{2011} \times DI_{2012} == .\frac{104}{100} \times \frac{122}{110} \times \frac{145}{125}.....$$

$$CI_{2013} = ...DI_{2010} \times DI_{2011} \times DI_{2012} \times DI_{2013} == .\frac{104}{100} \times \frac{122}{110} \times \frac{145}{125} \times \frac{165}{160}.....$$

Chain Volume Measure (GDP)

$$\text{CVM}GDP_{2010} = ...GDP2009....\times...CI_{2010}... = ...100...\times..\frac{104}{100} = 104.....$$

$$\text{CVM}GDP_{2011} = ...GDP2009....\times...CI_{2011....}... = ..100...\times..\frac{104}{100} \times \frac{122}{110}.. = ..115.35...$$

$$\text{CVM}GDP_{2012} = ...GDP2009....\times...CI_{2012....}... = ...100....\times....\frac{104}{100} \times \frac{122}{110} \times \frac{145}{125}... = ..133.80$$

$$\text{CVM}GDP_{2012} = ...GDP2009....\times...CI_{2013....}... = ...100....\times....\frac{104}{100} \times \frac{122}{110} \times \frac{145}{125} \times \frac{165}{160}... = ..137.98$$