QUIZ 1: Macro – Winter 2008

SOLUTIONS

For Questions 2 and 3: put final answers in the space provided. Calculators are allowed. Partial credit will be given to answers with an intuitive attempt at the correct procedure but a wrong answer. Answers with a totally incorrect procedure (even if the answer is correct) will be given zero partial credit. You must show your work to get full credit!!!!

Question 1

True or False? (No explanation, 1 point each – 6 total)
For simplicity, assume that I am an American citizen.

a. The use of “value added” to measure GDP with the production method allows to avoid double counting of the value of intermediate goods.

   TRUE. Using value added, the value of goods produced by a firm is net of the value of the used intermediate goods, which are measured as the value of firms producing them.

b. If in 2009 I purchase a house constructed in Chicago in 2007, this transaction will be accounted as Investment in the U.S. GDP of 2009.

   FALSE. This transaction is a transfer, because the house has not been constructed in 2009.

c. If in 2009 I purchase a house constructed in Chicago this year, this transaction will be accounted as Consumption in the U.S. GDP of 2009.

   FALSE. This transaction is accounted as 2008 GDP, but as Investment.

d. If in 2009 I teach a macro section in the Booth campus in London, this transaction will not be accounted as U.S. GDP of 2009.

   TRUE. I provide a service that is not produced on domestic soil, even though with domestic factor of production (my work). Hence it is part of the U.S. GNP, but not of the U.S. GDP.

e. If I use $50,000 of my income this year to invest in the stock market, this transaction is accounted as U.S. GDP of 2009, according to the expenditure method.
FALSE. This is a financial transaction! Stocks are not produced, so this is not accounted as GDP according to the expenditure method.

f. If the price index is not adjusted for the improvement in the goods’ quality, the measure of real GDP growth rate would be understated.

TRUE. Due to the improvement in the goods’ quality inflation may be overstated. Given that the real GDP growth rate is approximately equal to the growth rate of nominal GDP minus the inflation rate, this tends to understate the growth rate of real GDP.

Question 2

Consider an economy that produces only three types of fruit: apple, oranges and bananas. The production and price data for 2000 and 2008 are:

2000:

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>3,000 bags</td>
<td>$2 per bag</td>
</tr>
<tr>
<td>Oranges</td>
<td>8,000 bags</td>
<td>$4 per bag</td>
</tr>
<tr>
<td>Bananas</td>
<td>6,000 bunches</td>
<td>$3 per bunch</td>
</tr>
</tbody>
</table>

2008:

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>4,000 bags</td>
<td>$2 per bag</td>
</tr>
<tr>
<td>Oranges</td>
<td>32,000 bags</td>
<td>$5 per bag</td>
</tr>
<tr>
<td>Bananas</td>
<td>14,000 bunches</td>
<td>$2 per bunch</td>
</tr>
</tbody>
</table>

a. Find nominal GDP in 2000 and in 2008. What is the percentage change increase in nominal GDP? --- 4 points

Nominal GDP in 2000 = 3,000*2 + 8,000*4 + 6,000*3 = 56,000
Nominal GDP in 2008 = 4,000*2 + 32,000*5 + 14,000*2 = 196,000
Hence the percentage change of nominal GDP is = (196,000-56,000)/ 56,000 = 250%

250%

By definition the GDP deflator in the base year is = 1.


The 2008 output evaluated at 2000 prices is

\[ = 4,000 \times 2 + 32,000 \times 4 + 14,000 \times 3 = 178,000 \]

Hence, GDP deflator in 2008 = \( \frac{196,000}{178,000} \) = 1.1

Inflation rate = \( \frac{2008 \text{ GDP deflator} - 2000 \text{ GDP deflator}}{2000 \text{ GDP deflator}} \)

\[ = 1.1 - 1 = 10\% \]

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10%

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c. Find the real GDP in 2000 and 2008. What is the percentage change in real GDP using the exact formula? And using the approximated formula? --- 6 points.

Real GDP in 2000 = Nominal GDP in 2000/GDP deflator in 2000 = 56,000

Real GDP in 2008 = Nominal GDP in 2008/GDP deflator in 2008 = 196,000/1.1 = 178,181.8

Percentage change in real GDP = \( \frac{178,181.8 - 56,000}{56,000} \) = 218.18%

With the approximated formula:

Percentage change in real GDP = percentage change in nominal GDP – inflation rate

\[ = 250\% - 10\% = 240\% \]

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218.18 %

240%
Question 3

--- 6 points

Suppose that we want to calculate the market value generated by the economic activity of “Veronica School of Business” (VSB) and Company X in 2008. VSB teaches three section of Macro in the winter of 2008 and students pay a tuition of $100 per section. VSB hires a TA for the sections and pays him $90. It also pays $60 in taxes to the US government at the end of the year. Finally, VSB pays $20 to buy teaching equipment from Company X. Company X pays $10 to workers and $2 in taxes and in 2008 sells equipment only to VSB for the value of $20. Suppose the TA and the employees of X do not pay taxes and the Government does not spend anything in 2008.

You can summarize the information of the economic activity of 2008 as follows:

<table>
<thead>
<tr>
<th>VSB</th>
<th>Equipment purchased from X</th>
<th>$20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wages paid to TA</td>
<td>Taxes</td>
<td>$60</td>
</tr>
<tr>
<td>Revenues</td>
<td></td>
<td>$300</td>
</tr>
<tr>
<td>Company X</td>
<td>Wages paid to employees</td>
<td>$10</td>
</tr>
<tr>
<td>Taxes</td>
<td></td>
<td>$2</td>
</tr>
<tr>
<td>Revenues</td>
<td></td>
<td>$20</td>
</tr>
</tbody>
</table>

Calculate the market value of the economic activity described in 2008, showing that all three approaches seen in class give the same answer.

Production Method: my value added + value added of X = 300 + 20 = 320

Income Method: wages + net profits + taxes = 100 + 158 + 62 = 320

Expenditure Method: consumption + investment = 300+20 = 320

Question 4:

In the Economist article “Feeling the Heat”, the journalist reports that “some suggest that owners' equivalent rent should simply be dropped from the inflation index”. Why? -- 4 points [Your answer should be no more than 1 short sentence!!!]

The inclusion of owners’ equivalent rent in the inflation index tends to overstate inflation because of the rise in rents due to the housing bubble.