

Economics 100B, Fall 2005  
Sample Midterm Answers  
Chapter 2

1. We will calculate the answers according to the letter given for the missing variable.

Nominal GDP

- A. Nominal GDP<sub>1995</sub> = P<sub>stereo1995</sub>\*Q<sub>stereo1995</sub> + P<sub>CD1995</sub>\*Q<sub>CD1995</sub> = 5\*2 + 2\*3 = \$16  
 B. Nominal GDP<sub>1996</sub> = P<sub>stereo1996</sub>\*Q<sub>stereo1996</sub> + P<sub>CD1996</sub>\*Q<sub>CD1996</sub> = 10\*5 + 3\*5 = \$65  
 C. Nominal GDP<sub>1997</sub> = P<sub>stereo1997</sub>\*Q<sub>stereo1997</sub> + P<sub>CD1997</sub>\*Q<sub>CD1997</sub> = 15\*5 + 5\*8 = \$115

Real GDP in 1995 Prices

- D. Real GDP<sub>1995</sub> = P<sub>stereo1995</sub>\*Q<sub>stereo1995</sub> + P<sub>CD1995</sub>\*Q<sub>CD1995</sub> = 5\*2 + 2\*3 = \$16  
 E. Real GDP<sub>1996</sub> = P<sub>stereo1995</sub>\*Q<sub>stereo1996</sub> + P<sub>CD1995</sub>\*Q<sub>CD1996</sub> = 5\*5 + 2\*5 = \$35  
 F. Real GDP<sub>1997</sub> = P<sub>stereo1995</sub>\*Q<sub>stereo1997</sub> + P<sub>CD1995</sub>\*Q<sub>CD1997</sub> = 5\*5 + 2\*8 = \$41

Real GDP in 1996 Prices

- G. Real GDP<sub>1995</sub> = P<sub>stereo1996</sub>\*Q<sub>stereo1995</sub> + P<sub>CD1996</sub>\*Q<sub>CD1995</sub> = 10\*2 + 3\*3 = \$29  
 H. Real GDP<sub>1996</sub> = P<sub>stereo1996</sub>\*Q<sub>stereo1996</sub> + P<sub>CD1996</sub>\*Q<sub>CD1996</sub> = 10\*5 + 3\*5 = \$65  
 I. Real GDP<sub>1997</sub> = P<sub>stereo1996</sub>\*Q<sub>stereo1997</sub> + P<sub>CD1996</sub>\*Q<sub>CD1997</sub> = 10\*5 + 3\*8 = \$74

Real GDP in 1997 Prices

- J. Real GDP<sub>1995</sub> = P<sub>stereo1997</sub>\*Q<sub>stereo1995</sub> + P<sub>CD1997</sub>\*Q<sub>CD1995</sub> = 15\*2 + 5\*3 = \$45  
 K. Real GDP<sub>1996</sub> = P<sub>stereo1997</sub>\*Q<sub>stereo1996</sub> + P<sub>CD1997</sub>\*Q<sub>CD1996</sub> = 15\*5 + 5\*5 = \$100  
 L. Real GDP<sub>1997</sub> = P<sub>stereo1997</sub>\*Q<sub>stereo1997</sub> + P<sub>CD1997</sub>\*Q<sub>CD1997</sub> = 15\*5 + 5\*8 = \$115

Chained GDP, Benchmark = 1995

M. The value is the same as Real GDP in 1995 because this is the benchmark year.

$$\text{Chained GDP}_{1995} = P_{\text{stereo1995}} * Q_{\text{stereo1995}} + P_{\text{CD1995}} * Q_{\text{CD1995}} = 5 * 2 + 2 * 3 = \$16$$

N. Chained GDP<sub>1996</sub> is calculated by first calculating the chain-weight =

$$\sqrt{\frac{\text{RealGDP}_{1996 \text{ year}}^{1995 \text{ prices}}}{\text{RealGDP}_{1995 \text{ year}}^{1995 \text{ prices}}} * \frac{\text{RealGDP}_{1996 \text{ year}}^{1996 \text{ prices}}}{\text{RealGDP}_{1995 \text{ year}}^{1996 \text{ prices}}}} = \sqrt{\frac{\text{RealGDP}_{1996 \text{ year}}^{1995 \text{ prices}}}{\text{No min alGDP}_{1995 \text{ year}}} * \frac{\text{No min alGDP}_{1996 \text{ year}}}{\text{RealGDP}_{1995 \text{ year}}^{1996 \text{ prices}}}} =$$

$$\sqrt{\frac{35}{16} * \frac{65}{29}} = 2.2143. \text{ Next, we find the value of chained GDP by multiplying the}$$

benchmark year by the chain weight.

$$\text{Chained GDP}_{1996} = \text{Chained GDP}_{1995} * 2.2143 = 16 * 2.2143 = 35.4288.$$

O. Chained GDP<sub>1997</sub> is calculated by first calculating the chain-weight =

$$\sqrt{\frac{\text{RealGDP}_{1996 \text{ year}}^{1995 \text{ prices}}}{\text{No min alGDP}_{1995 \text{ year}}^{1996 \text{ prices}}} * \frac{\text{No min alGDP}_{1996 \text{ year}}^{1996 \text{ prices}}}{\text{RealGDP}_{1995 \text{ year}}^{1996 \text{ prices}}} * \frac{\text{RealGDP}_{1997 \text{ year}}^{1996 \text{ prices}}}{\text{No min alGDP}_{1996 \text{ year}}^{1996 \text{ prices}}} * \frac{\text{No min alGDP}_{1997 \text{ year}}^{1997 \text{ prices}}}{\text{RealGDP}_{1996 \text{ year}}^{1997 \text{ prices}}}} =$$

$$\sqrt{\frac{35}{16} * \frac{65}{29} * \frac{74}{65} * \frac{115}{100}} = 2.5336 .$$

Next, we find the value of chained GDP by multiplying the benchmark year by the chain weight.

$$\text{Chained GDP}_{1997} = \text{Chained GDP}_{1995} * 2.5336 = 16 * 2.5336 = 40.5376.$$

## 2. Ratio of Economies

A. To calculate the ratio of GDP, using the exchange rate, we do the following.

The value of U.S. GDP in U.S. dollars is 10 trillion.

Now, we convert the German GDP into U.S. dollars.

$$\text{German GDP in U.S. dollar} = \text{German GDP in deutschemark} * \frac{\text{dollars}}{\text{deutschemark}} =$$

$$4 \text{ trillion deutschemark} * \frac{1 \text{dollar}}{2 \text{deutschemark}} = 2 \text{ trillion dollars}$$

Thus, the ratio of German GDP to U.S. GDP is  $\frac{2 \text{trillion}}{10 \text{trillion}}$ . Therefore, the German economy is about 20% of the United States GDP.

B. Now, using common prices, the ratio of the price level in Germany to the ratio of the price level in the U.S. in dollars is  $\frac{\text{German Prices}}{\text{US Prices}} = .90$ . Now, the Real GDP in U.S. dollars of the

$$\text{U.S. in German prices} = \frac{\text{German Prices}}{\text{US Prices}} * \text{Nominal U.S. GDP} = .9 * 10 \text{ trillion} = \$9 \text{ trillion}.$$

Thus,  $\frac{\text{German GDP in Dollars}}{\text{U.S. GDP in Dollars}} = \frac{2 \text{trillion}}{9 \text{trillion}} = .222$ . Therefore, the German economy is about 22% of the United States GDP.

C. The second option is preferred to the first option. This is because using common prices accounts for relative price differences across countries, while the exchange rate does not say anything about differences between prices across countries. Thus, if local prices are different, the measure will reflect differences in GDP.