## Problem 1

Gorgonzola is a small island nation with a simple economy that produces only six goods: sugar cane, yo-yos, rum, peanuts, harmonicas, and peanut butter. Assume that one-quarter of all the sugar cane is used to produce rum and one-half of all the peanuts are used to produce peanut butter.

A. Use the production and price information in the table to calculate nominal GDP for 2015.

B. Use the production and price information in the table to calculate real GDP for 2013, 2014, and 2015 using 2013 as the base year. What is the growth rate of real GDP from 2013 to 2014 and from 2014 to 2015?

C. Use the production and price information in the table to calculate real GDP for 2013, 2014, and 2015 using 2014 as the base year. What is the growth rate of real GDP from 2013 to 2014 and from 2014 to 2015?

| Quantity | Price | Quantity | Price | Quantity | Price |
|---|---|---|---|---|---|
| 180 | 0.8 | 180 | 1 | 225 | 1.15 |
| 600 | 2.5 | 700 | 3 | 750 | 4 |
| 150 | 10 | 160 | 12 | 180 | 15 |
| 250 | 2 | 225 | 2.5 | 225 | 2.5 |
| 75 | 25 | 75 | 30 | 85 | 30 |
| 100 | 4.5 | 85 | 4.5 | 85 | 5 |

## Solution - 1

(a) Nominal GDP = (225 x $1.15) + (750 x $4.00) + (180 x $15.00) + (225 x $2.50) + (85 x $30.00) +(85 x $5.00) = $258.75 + $3,000.00 + $2,700.00 + $562.50 + $2,550.00 + $425.00 = $9,496.25

(b) Real GDP for 2013 = (180 x $0.80) + (600 x $2.50) + (150 x $10.00) x (250 x $2.00) + (75 x $25.00) + (100 x $4.50) = $5,969.00.

Real GDP for 2014 = (180 x $0.80) + (700 x $2.50) + (160 x $10.00) x (225 x $2.00) + (75 x $25.00) + (85 x $4.50) = $6,201.50.

Real GDP for 2015 = (225 x $0.80) + (750 x $2.50) + (180 x $10.00) x (225 x $2.00) + (85 x $25.00) + (85 x $4.50) = $6,812.50.

The growth rate of real GDP during 2013 = [($6,201.50 − $5,969.00) / $5,969.00] x 100 = 3.90%.

The growth rate of real GDP during 2014 = [($6,812.50 − $6,201.50) / $6,201.50] x 100 = 9.85%.

(c) Real GDP for 2013 = (180 x $1.00) + (600 x $3.00) + (150 x $12.00) x (250 x $2.50) + (75 x $30.00) + (100 x $4.50) = $7,105.00.

Real GDP for 2014 = (180 x $1.00) + (700 x $3.00) + (160 x $12.00) x (225 x $2.50) + (75 x $30.00) + (85 x $4.50) = $7,395.00.

Real GDP for 2015 = (225 x $1.00) + (750 x $3.00) + (180 x $12.00) x (225 x $2.50) + (85 x $30.00) + (85 x $4.50) = $8,130.00.

The growth rate of real GDP during 2013 = [($7,395 − $7,105) / $7,105] x 100 = 4.08%.

The growth rate of real GDP during 2014 = [($8,130 − $7,395) / $7,395] x 100 = 9.94%.

How growth rates change when we change base prices. highlight this point in the presentation.

**Problem 2.**

The GDP deflator is calculated as (nominal GDP / real GDP) x 100. The change in price level is calculated as [(GDP deflator's value in the second period – GDP deflator's value in the first period) / GDP deflator's value in the first period] x 100.

|      | Real GDP | Nominal GDP | GDP deflator | % change in price level |
|------|----------|-------------|--------------|-------------------------|
| 2005 | 2,297.82 | 2,297.82    |              | -                       |
| 2006 | 2,383.07 | 2,390.20    |              |                         |
| 2007 | 2,460.99 | 2,510.11    |              |                         |
| 2008 | 2,486.88 | 2,558.02    |              |                         |
| 2009 | 2,346.67 | 2,456.66    |              |                         |
| 2010 | 2,442.67 | 2,576.22    |              |                         |
| 2011 | 2,530.36 | 2,699.10    |              |                         |
| 2012 | 2,539.89 | 2,749.90    |              |                         |
| 2013 | 2,542.58 | 2,809.48    |              |                         |
| 2014 | 2,583.37 | 2,903.79    |              |                         |

**Solution**

The GDP deflator is calculated as (nominal GDP / real GDP) x 100. The change in price level is calculated as [(GDP deflator's value in the second period – GDP deflator's value in the first period) / GDP deflator's value in the first period] x 100.

|      | Real GDP | Nominal GDP | GDP deflator | % change in price level |
|------|----------|-------------|--------------|-------------------------|
| 2005 | 2,297.82 | 2,297.82    | 100.00       | -                       |
| 2006 | 2,383.07 | 2,390.20    | 100.30       | 0.30%                   |
| 2007 | 2,460.99 | 2,510.11    | 102.00       | 1.69%                   |
| 2008 | 2,486.88 | 2,558.02    | 102.86       | 0.85%                   |
| 2009 | 2,346.67 | 2,456.66    | 104.69       | 1.78%                   |
| 2010 | 2,442.67 | 2,576.22    | 105.47       | 0.75%                   |
| 2011 | 2,530.36 | 2,699.10    | 106.67       | 1.14%                   |
| 2012 | 2,539.89 | 2,749.90    | 108.27       | 1.50%                   |
| 2013 | 2,542.58 | 2,809.48    | 110.50       | 2.06%                   |
| 2014 | 2,583.37 | 2,903.79    | 112.40       | 1.72%                   |