Chapter 2. Quantitative Answers

1. The following is actual data from the Bureau of Labor Statistics for Texas and the Dallas-Fort Worth-Arlington (DFW) area for July 2013:

<table>
<thead>
<tr>
<th>Variable</th>
<th>DFW</th>
<th>Texas</th>
<th>Texas excluding DFW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Civilian Labor Force</td>
<td>a</td>
<td>12,868,300</td>
<td>b</td>
</tr>
<tr>
<td>Total Civilian Employment</td>
<td>3,215,600</td>
<td>c</td>
<td>d</td>
</tr>
<tr>
<td>Total Civilian Unemployment</td>
<td>219,700</td>
<td>e</td>
<td>f</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>g</td>
<td>h</td>
<td>6.75%</td>
</tr>
</tbody>
</table>

Fill in values for a-h.

Answers:

\[
\begin{align*}
a &= 3,435,300 \\
b &= 9,433,000 \\
c &= 12,010,900 \\
d &= 8,795,300 \\
e &= 857,400 \\
f &= 637,700 \\
g &= 6.4\% \\
h &= 6.7\% \\
\end{align*}
\]

2. In January 2013, according to the Bureau of Labor Statistics (http://www.bls.gov), the population of men 16 years of age and above in the US was approximately 118 million. 76 million of these men were employed and roughly 7 million were unemployed. The population of females aged 16 and above numbered 127 million, with 67 million employed and 6 million unemployed. How do the labor force participation and unemployment rates compare across men and women?

Answers:

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor Force Participation Rate</td>
<td>73.2%</td>
<td>59.2%</td>
<td>65.9%</td>
</tr>
<tr>
<td>Unemployment Rate</td>
<td>4.9%</td>
<td>4.2%</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

Population = total males + total females = 118 million + 127 million = 245 million

Labor Force = total males employed + total males unemployed + total females employed + total females unemployed = 76 million + 7 million + 67 million + 6 million = 156 million

Employed = total males employed + total females employed = 76 million + 67 million = 143 million

Unemployed = total males unemployed + total females unemployed = 7 million + 6 million = 13 million
Total Labor Force Participation Rate = Labor Force / Total Population = 156 million / 245 million = 63.7%

Total Unemployment Rate = Total Unemployed / Labor Force = 13 million / 153 million = 8.5%

Male Labor Force Participation Rate = Males in Labor Force / Total Male Population = 83 million / 118 million = 70.3%

Male Unemployment Rate = Males Unemployed / Males in Labor Force = 6 million / 83 million = 7.2%

Female Labor Force Participation Rate = Females in Labor Force / Total Female Population = 73 million / 127 million = 57.5%

Female Unemployment Rate = Females Unemployed / Females in Labor Force = 7 million / 73 million = 9.6%

3. (a) Before the government changes the level of retirement benefits, the LFP is 90,000/100,000, or 90%, while the unemployment rate is 5,000/90,000, or 5.6%. After the policy, the new LFP is 88,000/100,000, or 88%, while the unemployment rate has increased to 5,000/88,000, or 5.7%.

(b) Although the unemployment rate has increased, unemployment remains unchanged at 5,000.

4. (a) Setting $L_s = L_d$, solving for $w^*$, and plugging into either $L_s$ or $L_d$ yields:

\[-40 + 10w^* = 160 - 10w^*\]
\[200 = 20w^*\]
\[w^* = $10/hr\]
\[L^* = 60\]

Since there is no unemployment, the labor force is equal to the number of employed, which is 60.

(b) Given $L_s0$:

\[-20 + 10w^* = 160 - 10w^*\]
\[180 = 20w^*\]
\[w^* = $9/hr\]

5. Referring to the previous question, suppose a new firm decides to locate in the small town after the decrease in the equilibrium wage. As a result, the aggregate labor supply curve is $L_s' = -20 + 10\omega$ and the new aggregate labor demand curve is now $L_d' = 180 - 10\omega$.

(a) Calculate the new equilibrium wage and the level of employment.

Answers:
\[ L' = L'' = -20 + 10\omega = 180 - 10\omega \]
\[ 20\omega = 200 \]
\[ \omega = 10 \]
\[ L' = -20 + 10\omega = -20 + 10(10) = 80 \]

(b) If a worker in this market works an 8-hour day and plans to spend the entire day’s income to buy DVDs at $20 each, what is the worker’s real wage \( \omega^R \) in terms of DVDs?

**Answers:**

\[ (L')(\omega) = (8)(10) = 80 \]
\[ \omega^R = (L')(\omega) / $20 / DVD = (8)(10) / (20) = 40 DVDs \]

6. Use the following information to calculate the worker’s earnings, total compensation, and income for one month.

<table>
<thead>
<tr>
<th>Wage rate</th>
<th>$10.00/hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of time worked</td>
<td>160 hours</td>
</tr>
<tr>
<td>Employer-provided health insurance</td>
<td>$120.00</td>
</tr>
<tr>
<td>Social Security Tax Amount</td>
<td>$100.00</td>
</tr>
<tr>
<td>Interest on Investments</td>
<td>$50.00</td>
</tr>
</tbody>
</table>

**Answers:**

Earnings = wage rate * units of time worked = $10/hour * 160 hours = $1,600

Total compensation = earnings + employee benefits (in-kind or deferred payments) = $1,600 + $120 + $100 = $1,820

Income = total compensation + unearned income = $1,820 + $50 = $1,870