Computing Growth Rates

Table 1. Income data for Albania

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>GNI per capita growth (annual %)</td>
<td>5.8</td>
<td>5.4</td>
<td>0.1</td>
<td>3.2</td>
<td>3.1</td>
</tr>
<tr>
<td>GNI per capita (constant LCU)</td>
<td>177,789</td>
<td>187,445</td>
<td>187,571</td>
<td>193,568</td>
<td>199,637</td>
</tr>
</tbody>
</table>


**Compound interest equation**

\[
Y_n = Y_0 \left(1 + \frac{g}{100}\right)^n
\]

where

- \( Y_n \) = GNI per capita in Year \( n \)
- \( Y_0 \) = GNI per capita in Year 0
- \( g \) = annual growth rate (in percent)
- \( n \) = number of years

**Sample calculations**

1. Compute the growth rate in real GNI per capita in 2011.

\[
g = 100 \left(\frac{199637 - 193568}{193568}\right)
\]

\[
g = 3.1
\]

Answer: Real GNI per capita in 2011 grew 3.1 percent (as also shown in Row 2 in Table 1).

2. Compute the average annual growth rate in real GNI per capita from 2007 through 2011.

\[
199637 = 177789 \left(1 + \frac{g}{100}\right)^4
\]

\[
1 + \frac{g}{100} = \left(\frac{199637}{177789}\right)^{\frac{1}{4}}
\]

\[
g = 2.9
\]

Answer: The average annual growth rate is 2.9%.