Chapter 14 Effects of Inflation

• Definition

➢ Inflation is an increase (over time) in the amount of money necessary to buy goods.
➢ For example,
  o The price of 1 McDonald’s Big Mac was $2.14 in 08/03.
  o The price of 1 McDonald’s Big Mac was $2.23 in 08/04.
  o Currently, it’s around $3.
➢ In simpler terms, “inflation means that your money won’t buy as much today as it did yesterday.”

• Causes of inflation\(^1\)

➢ Demand for goods exceeds supply. That is, “too much money chasing too few goods.”
➢ Government prints money more than the economy is worth.
➢ Increases in production costs that when passed to customers push prices up.
➢ Excessive spending power of consumers.
➢ Impact of international market prices (e.g., oil price).
➢ Unresponsive prices that seldom declines (e.g., prices set by large firms).

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\(^1\) Adapted from Riggs et al., *Engineering Economy*, McGraw-Hill, 1996.
• **Consequences of inflation**
  - Consequences depend on degree of inflation.
  - With *mild* inflation, rate is 2 to 4%/year, the economy prospers.
  - However, mild inflation often leads to a *moderate* inflation, with a rate of 5 to 9%/year. People start buying ahead.
  - *Severe* inflation occurs when inflation rate exceeds 10%. People with fixed incomes suffer.
  - *Hyperinflation* is when a nation’s currency drastically looses value. Money becomes worthless.

• **Control of inflation**
  - Control of inflation requires government intervention.
  - It is not easy to achieve, given all the factors that comes to play.

• **Measuring inflation**
  - Inflation is measured based on actual price changes of basic commodities.
  - This gets complicated since different goods exhibit different price change patterns.
  - Predicting future inflation rates is not too reliable.
• **Deflation**
  - This is the opposite of inflation. It happens when supply exceeds demand. That is, when money is tight.
  - Deflation has very bad consequences if it lasts long. E.g., U.S. Great Depression in the Thirties.

• **Inflation rate**
  - Money in time period $t_1$ can be related to money in time period $t_2$ by the following

  \[
  \text{Dollars}_{t_1} = \frac{\text{Dollars}_{t_2}}{\text{inflation rate between } t_1 \text{ and } t_2}
  \]

  - Dollars in period $t_1$ are termed *constant-value dollars* or *today’s dollars*
  - Dollars in time period $t_2$ are termed *future dollars* or *then-current dollars*.
  - If $n$ is the number if time periods between $t_1$ and $t_2$, and $f$ is the inflation rate per time period. Then,

    \[
    \text{Future dollars at } t_2 = (\text{Today’s dollars at } t_1) (1+f)^n.
    \]

• **Annual inflation rate in Lebanon**

<table>
<thead>
<tr>
<th>Year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f$</td>
<td>4.2%</td>
<td>10.5%</td>
<td>9%</td>
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</tbody>
</table>

Source: Economist Intelligence unit, June 2008 Estimates.

\[\text{Annual inflation rate in Lebanon}^2\]
• **Inflation-adjusted interest rate**
  
  ➢ Denote by $i$ the *real interest rate* per time period. This interest represents the actual gain on investment without the effect of inflation.
  
  ➢ Then, with an inflation rate of $f$, $P$ dollars now are equivalent to $F$, after $n$ years where

  $$F = P(1+f)^n(1+i)^n.$$  

  ➢ That is,

  $$F = P(1+i+f+if)^n = P(1+i_f)^n.$$  

  ➢ The interest rate $i_f$ is called the *inflation-adjusted interest*,

  $$i_f = i + f + if$$  

  ➢ This is the interest rate observed in the market.
  
  ➢ Utilizing $i_f$ in the economic evaluation of a project takes into account the effects of inflation and the effect of real interest.

• **Future value in today’s dollar and maintaining purchasing power**
  
  ➢ The future value in today’s dollars is the future value by excluding the effect of inflation, $F = P(1+i)^n$.
  
  ➢ The amount of future dollars which has the same *purchasing power* as $P$ dollars today is $F = P(1+f)^n$. (This is the same as future dollars.)