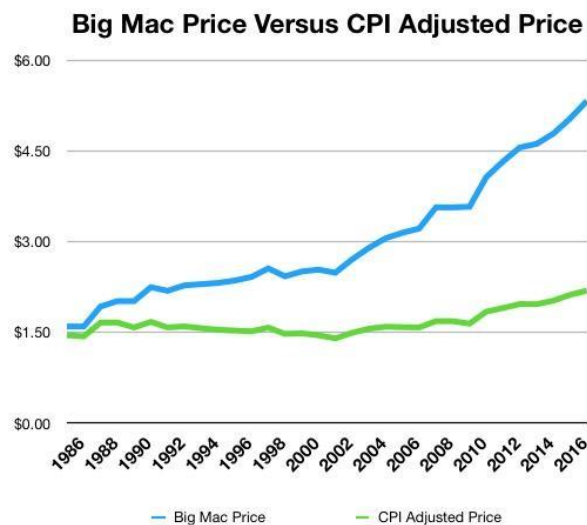


Chapter 14 Effects of Inflation

• Definition

- *Inflation* is an increase (over time) in the amount of money necessary to buy goods.
- For example,
 - The price of McDonald's Big Mac¹ in the US was \$2.14 in 2003.
 - The price of Big Mac in the US was around \$3.2 in 2010 and \$5 in 2015.
 - Currently, it's around \$5.67.



- In simpler terms, “inflation means that your money won’t buy as much today as it did yesterday.”

¹ The Big Mac Index compares prices of Big Mac around the world to gauge inflation in different and currency devaluation in different countries, <https://fxssi.com/big-mac-index>

- **Causes of inflation²**

- 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).

- **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 loses value. Money becomes worthless.

² Adapted from Riggs et al., *Engineering Economy*, McGraw-Hill, 1996.

- **Control of inflation**

- Control of inflation requires government intervention (specifically central banks).
- 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

$$\text{Dollars}_{t_1} = \frac{\text{Dollars}_{t_2}}{1 + \text{inflation rate between } t_1 \text{ and } t_2}$$

- 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 of 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 Lebanon³**

- We went from deflation in 2015 to hyperinflation in 2020.

Year	2010	2011	2012	2014	2015
f	3.98%	5.70%	2.6%	1.1%	-0.8%

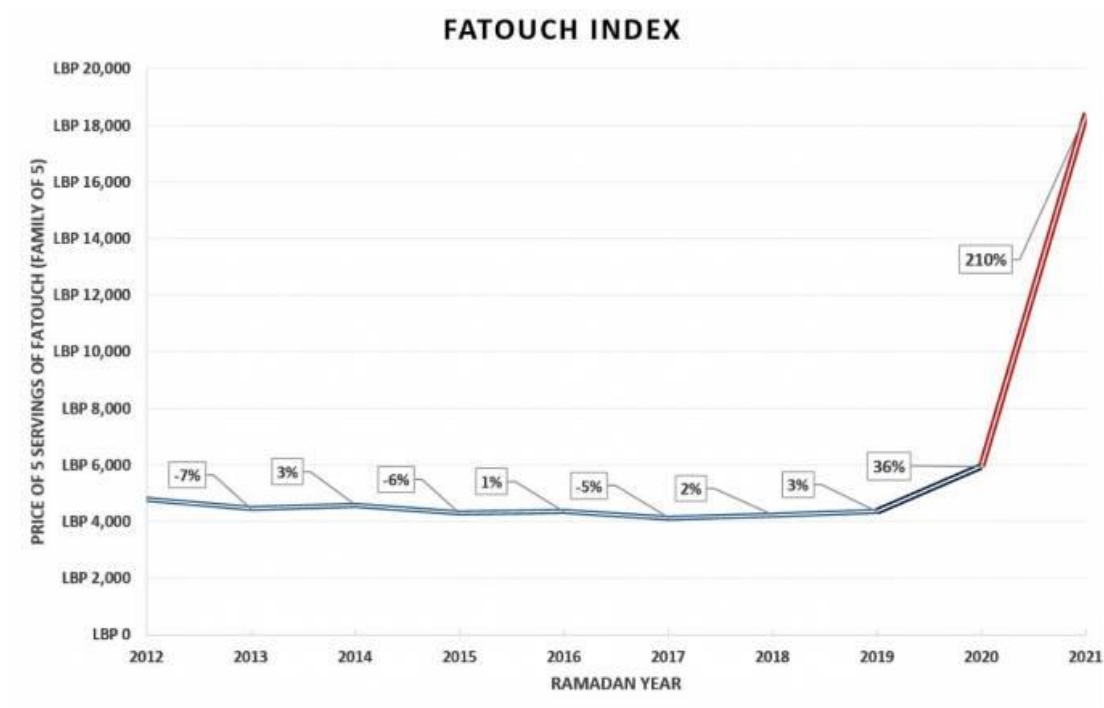


Prof. Steve Hanke  @steve_hanke · Jun 26

#Venezuela's #inflation tops my chart again this week at 2553%/yr by my measure. It's followed by #Zimbabwe with an inflation rate of 999%/yr. Since last week, #Lebanon's inflation has surged to 363%/yr., overtaking Syria's for third place.

Country	Free-Market Exchange Rate	Date of Hanke Measurement	Hanke Annual Measured Inflation Rate ¹	IMF Year-End Inflation Projection ²	Hanke - IMF Differential
Venezuela†	199,495.39 USD/VES	06/25/20	2,553%	15,000%	-12,447% pts.
Zimbabwe*	126.44 USD/ZIM	06/25/20	999%	154%	845% pts.
Lebanon	7000.00 USD/LBP	06/25/20	363%	17%	346% pts.
Syria	2500.00 USD/SYP	06/25/20	314%	N/A	-
Sudan	133.00 USD/SDG	06/25/20	88%	96%	-09% pts.
Argentina	73.52 USD/ARS	06/25/20	67%	N/A	-
Iran	196,200.00 USD/IRR	06/25/20	45%	42%	03% pts.
Brazil	5.36 USD/BRL	06/25/20	39%	3%	36% pts.
Libya	5.87 USD/LYD	06/25/20	33%	22%	11% pts.
Nigeria	459.00 USD/NGN	06/25/20	27%	14%	13% pts.

³ Source: Economist Intelligence unit.



(Source: Crisis Observatory at AUB)

- **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.)