

HIGH INFLATION

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- Hyperinflation are periods of high inflation.
- High inflation comes from high nominal money growth.
- High nominal money growth comes from the combination of large budget deficits and the inability to finance these large budgets through borrowing, either from the public or from abroad.
- So, the Govt. resorts to financing the deficit by, in effect, money creation. It issues bonds to the Central bank to buy them, with the money it creates. This process is called debt monetization.

SEIGNORAGE:

The real revenue from money creation is seignorage.

$$\therefore \text{Seignorage} = \frac{\Delta M}{P} \quad \text{--- (1)}, \quad \text{where } \Delta M = \begin{array}{l} \text{change in} \\ \text{nominal} \\ \text{money stock} \\ \text{(nominal} \\ \text{money} \\ \text{creation} \\ \text{during the} \\ \text{period)} \end{array}$$

& P = price level.

Eqn. (1) can also be expressed as:

$$\text{Seignorage} \times \frac{\Delta M}{P} = \frac{\Delta M}{M} \times \frac{M}{P} \quad \text{--- (2)}$$

From (2). Seignorage can also be conceived as (2)
the product of the rate of nominal money growth ($\frac{\Delta M}{M}$)
and real money balances (M/p).

Dividing both sides of Eqn. (2) by real income (Y),
per month
we obtain,

$$\frac{\text{Seignorage}}{Y} = \frac{\Delta M}{M} \cdot \left(\frac{M/p}{Y} \right) \text{ ————— (3)}$$

Suppose, the Govt. is running a budget deficit
equal to 10% of real income and decides to finance
it through seignorage, $\therefore \frac{\text{deficit}}{Y} = \frac{\text{seignorage}}{Y} = 0.1$ or 10%.

Suppose people hold real balances equal to 2 months
of income, so, $\left(\frac{M/p}{Y} \right) = 2$. This implies that nominal
money growth must satisfy

$$\frac{\Delta M}{M} \times 2 = 0.1$$

$$\Rightarrow \frac{\Delta M}{M} = 0.05$$

i.e. to finance a deficit of 10% of real income
through seignorage, the monthly growth rate of
nominal money ~~growth~~ must be 5%.

(3)

But, this does not mean that the Govt. can finance a deficit equal to 20% of real income through a nominal money growth rate of 10%, the reason being that as the nominal money growth increases, so does inflation. And as inflation increases, the opportunity cost of holding money increases, leading people to reduce their real money balances. In terms of Eqn. (2), an increase in nominal money growth, $\frac{\Delta M}{M}$, leads to a decrease in real money balances, M/P , so that an increase in nominal money growth will generate a less than proportional increase in seignorage.

Inflation and Real Money Balances:

- What determines the amount of real money balances that people are willing to hold?
- And how does this amount depend on nominal money growth?

→ To answer this, let's recall the LM relation,

$$\text{i.e. } \frac{M}{P} = YL(i) \quad (4) \quad \text{where } i = \text{nominal interest rate.}$$

From (4), Higher real income leads people to hold larger real money balances. and a

(4)

higher nominal interest rates increases the opportunity cost of holding money rather than bonds and leads people to reduce their real money balances.

We know that,

Nominal int. rate, $i = r + \pi^e$, where r = real int. rate
 π^e = expected inflation.

Substituting the above relation in eqn. (4), we get,

$$\frac{M}{P} = Y L(r + \pi^e) \quad \text{--- (5)}$$

During hyperinflation, expected inflation (π^e) is likely to vary much more than the other two variables (i.e. Y and r). So, it is not a bad approximation to assume that both Y and r are constant, and focus just on the movements in π^e .

So, we write,

$$\frac{M}{P} = \bar{Y} L(\bar{r} + \pi^e) \quad \text{--- (6)}$$

In times of hyperinflation, eqn. (6) tells us that we can think of real money balances as depending primarily on the expected rate of inflation. As expected inflation increases and it becomes more and more costly to hold money, people will reduce their real money balances.

Let's Summarize what we have learned:

$$(1) \quad \frac{\Delta M}{P} = \frac{\Delta M}{M} \times \frac{M}{P}$$

i.e. the relation between seignorage, nominal money growth and real money balances: Seignorage is equal to the product of nominal money growth and real money balances.

$$(2) \quad \frac{M}{P} = \bar{Y} L(\bar{\pi} + \pi^e)$$

i.e. the relation between real money balances and expected inflation: an increase in expected inflation leads people to decrease their real money balances.

Combining the two equations gives:

$$\begin{aligned} \text{Seignorage} &= \left(\frac{\Delta M}{M} \right) \left(\frac{M}{P} \right) \\ &= \left(\frac{\Delta M}{M} \right) \left[\bar{Y} L(\bar{\pi} + \pi^e) \right] \quad \text{--- (7)} \end{aligned}$$

Eqn. (7) shows us how the need to finance a large budget deficit through seignorage can lead not only to high inflation, but also, as in the case during hyperinflation, to high and increasing inflation.

To summarize, Hyperinflation is typically characterised by increasing inflation. There are two reasons: 1) Higher nominal money growth leads to higher inflation, inducing people to reduce their real money balances, requiring even higher nominal money growth (and thus leading to even higher inflation) to finance the same real deficit.

2) Higher inflation often increases the deficit, which requires higher nominal money growth, and even higher inflation.