The Inflation Process

Agenda

• Inflation
  ➢ The triangle model
• DAD, SAS and Inflation Adjustment

Inflation

• Definition:
  \[ \pi(t) = \left\{ \frac{(P(t) - P(t-1))}{P(t-1)} \right\} \ast 100 \]

Inflation Expectations

• Three explicit factors
  ➢ Called the triangle model
• \( \pi \) depends on 3 components:
  ➢ Inflationary expectations or \( \pi^e \).
  ➢ Excess demand or \( \pi^{ED} \).
  ➢ Inflation shocks or \( \pi^Z \).

Inflation Expectations

• If people expect a particular level of inflation, that level will likely occur even without any pressure from the output or labor market.

Inflation Expectations

• Key Assumption: Inflation expectations, \( \pi^e \), are formed by simple adaptive expectations.
  ➢ \( \pi^e = \pi(t-1) \)
Excess Demand

- Excess demand inflation, $\pi^{ED}$, is measured by the output gap.
  
  $\pi^{ED} = f[ Y(t) - Yn(t) ]$
  
  - Where $f > 0$
    - The bigger is $f$, the faster is the change in $\pi(t)$ for any given (lagged) output gap.
    - The bigger is the (lagged) output gap, the faster is the change in $\pi(t)$ for any given $f$.

Inflation Expectations

- Key Assumption: Because of wage and price stickiness, current inflation depends on lagged excess demand.
  
  $\pi^{ED} = f[ Y(t-1) - Yn(t-1) ]$

Inflation Shocks

- Inflation shocks, $Z$, are assumed to be exogenous.
  
  - Changes in input costs that are independent of demand.
    - Changes in imported goods prices, especially oil.
      - Price versus exchange rate
    - Changes in competitive pressures.
  
  - Can be favorable (-) or unfavorable (+).
  
  - Can be temporary or permanent.

Inflation

- $\pi(t) = \pi(t-1) + f[ Y(t-1) - Yn(t-1) ] + Z(t)$
  
  - Expected inflation, \textit{plus}
  - Excess demand inflation, \textit{plus}
  - Inflation shocks.
  
  - This is the new SAS curve

SAS Curve

- The Short-run Aggregate Supply (SAS) curve was based on \textit{P}-level adjustment
  
  - The Short-run Aggregate Supply (SAS) curve is now based on $\pi$ adjustment
AD Curve

- The Aggregate Demand (AD) curve is based on levels of the underlying variables.
  - Level of Ap, Md, and Ms $\Rightarrow$ level of Y and P.

DAD Curve

- The Dynamic Aggregate Demand (DAD) curve is based on growth rates of the underlying variables.
  - Growth rate of Ap, Md and Ms $\Rightarrow$ growth rate of Y and P (or $\pi$).
  - R is still measured in level terms.

The DAD-SAS Model

- Graphically
  - Subscripts now represent years (or time periods) rather than sequential equilibrium levels.
The DAD – SAS Model and $\pi$ Adjustment

- $\pi$ adjustment can occur because of:
  - Demand shocks,
  - Inflation shocks, or
  - Supply shocks.

Demand Shocks

- Types of DAD Shock
  - Favorable (increases $Y$ relative to $Y_n$)
    - Faster growth of (increased) $A_p$
    - Lower $t$
    - Faster growth of (increased) $M_s$
    - Slower growth of (decreased) $L_0$

Demand Shocks and $\pi$ Adjustment

- Favorable demand shock.
  - Increase DAD, raise $Y$ (relative to $Y_n$), leave $\pi$ unchanged in the current time period.
    - $\pi$ adjustment does NOT take place in the current time period because it depends on
      - the lagged adjustment to excess demand, and
      - inflationary expectations
    - which depend on lagged $\pi$.

Demand Shocks and $\pi$ Adjustment, 1

Demand Shocks and $\pi$ Adjustment, 2
Demand Shocks and $\pi$ Adjustment, 3

Demand Shocks and $\pi$ Adjustment, 4

Demand Shocks and $\pi$ Adjustment, 5

Major Point
- The economy reaches $Y_n$ through the repetition of $\pi$ adjustment year after year.
- Each year, conditions in the previous year determine $\pi$ in the current year:
  - Inflationary expectations and
  - Excess/insufficient demand.

Inflation Shocks, $Z$
- Types of Inflation Shocks
  - Unfavorable (increases $\pi$)
    - Higher imported goods and/or raw material prices
      - Especially oil
    - Weaker currency
    - Reduced competitive pressures
      - Exogenous wage push
      - Reduced globalization
      - Increased regulation
  - Favorable (reduces $\pi$)
    - Lower imported goods or raw material prices
      - Especially oil
      - Stronger currency
    - Increased competitive pressures
      - Globalization
      - Decreased regulation
Unfavorable Inflation Shock

- Increase SAS, lower $Y$ (relative to $Y_n$), increase $\pi$ in the current time period.
- $\pi$ adjustment DOES take place in the current time period.

Inflation Shocks and $\pi$ Adjustment, 1

Inflation Shocks and $\pi$ Adjustment, 2

Inflation Shocks and $\pi$ Adjustment, 3

Inflation Shocks and $\pi$ Adjustment, 4

Inflation Shocks and $\pi$ Adjustment, 5
Major Point

• The economy reaches $Y_n$ through the repetition of $\pi$-dot adjustment year after year.
  ➢ Each year, conditions in the previous year determine $\pi$-dot in the current year:
    • Inflationary expectations and
    • Excess/insufficient demand.

DAD, SAS and $\pi$ Adjustment

• Summary of (Short-term) Effects
  ➢ Favorable DAD Shock
    • Higher $Y$ (relative to $Y_n$) and $\pi$.
  ➢ Unfavorable DAD Shock
    • Lower $Y$ (relative to $Y_n$) and $\pi$.
  ➢ Favorable SAS Shock
    • Higher $Y$ (relative to $Y_n$) and lower $\pi$.
  ➢ Unfavorable SAS Shock
    • Lower $Y$ (relative to $Y_n$) and higher $\pi$.

Supply Shocks

• Supply shocks occur when there are permanent shifts in
  ➢ Productivity
  ➢ Competitive pressures
• Supply shocks change $Y_n$.
  ➢ Because $Y_n$ changes, the $\pi$ adjustment process is short-circuited.
  ➢ This results in permanently changed $\pi$.

Supply Shocks and $\pi$ Adjustment

Major Point

• The economy moves to its new $Y_n$ and results in a permanent change in $\pi$ without any change in DAD.
• It is likely that the new $Y_n$ will be reached through a repetition of $\pi$ adjustment year after year.
  ➢ Each year, conditions in the previous year determine $\pi$ in the current year:
    • Inflationary expectations and
    • Excess/insufficient demand.