Understanding Inflation

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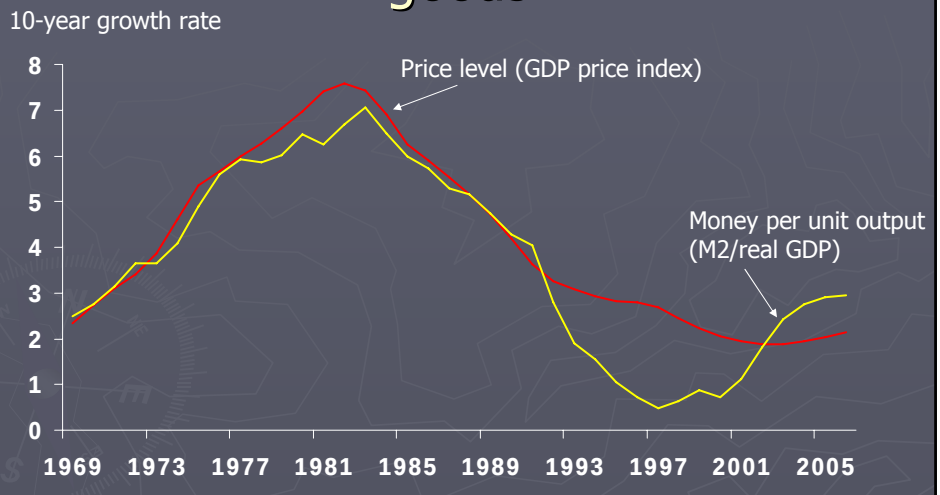
Overview

- Inflation in the long run & short run
- How do we measure inflation?
- Core inflation
- Trimmed mean inflation
- Why do we care about inflation?

Inflation in the long run

- General increase in prices
- "Inflation is always and everywhere a monetary phenomenon…" – Milton Friedman
  - Too many dollars chasing too few goods
  - Equation of Exchange: PY = MV
  - Very good long run description

Too many dollars chasing too few goods



Inflation in the short run

- Friedman's dictum not very helpful in short run
- As Don Patinkin noted:
  - The price of potatoes is everywhere and always a potato phenomenon. Obviously true, not very useful.
- Is PY = MV wrong?
  - No. Money (M), velocity (V) and output (Y) all change in complicated ways

Inflation in the short run

- Most short-run models have something like this at heart:

$$\Pi = \Pi^e + \theta \times (y - \hat{y}) + \Psi$$

  - Π = inflation rate
  - Π^e = measure of expected future inflation
  - $y - \hat{y}$ = deviation of output from potential ("output gap")
  - Ψ = "cost shocks"

Inflation in the short run

- Most central banks follow interest rate rules:
  - Raise interest rate if inflation gets too high, lower if inflation gets too low
  - "Taylor rule":

$$i = \text{constant} + 1.5 \times \Pi + 0.5 \times (y - \hat{y})$$

- How do you measure Π?

Measuring inflation

- Increase in "price level"
  - What do we mean?
- Increase in some sort of **average** of all prices
- $P = (P_1 + P_2 + \ldots + P_N)/N$?
  - Nope: treats all goods as equally important (e.g., pepper is as important as shelter)

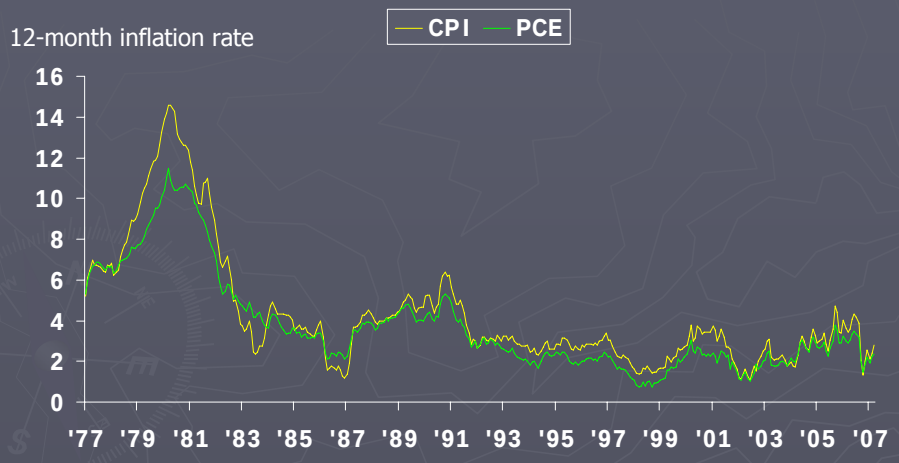
Measuring inflation

- $P = w_1 \times P_1 + w_2 \times P_2 + \ldots + w_N \times P_N$
  - w_i are weights, measure importance of each good
  - E.g., w_i = share of spending on good i
- Most price indexes have this form
  - Consumer Price Index (CPI)
  - Personal Consumption Expenditures (PCE) price index

The PCE

- Since 2000, Fed's preferred inflation measure
- Bigger "basket" of goods & services than CPI
- Expenditure weights updated monthly
  - CPI, every two years
- Slower to release than CPI, subject to revision

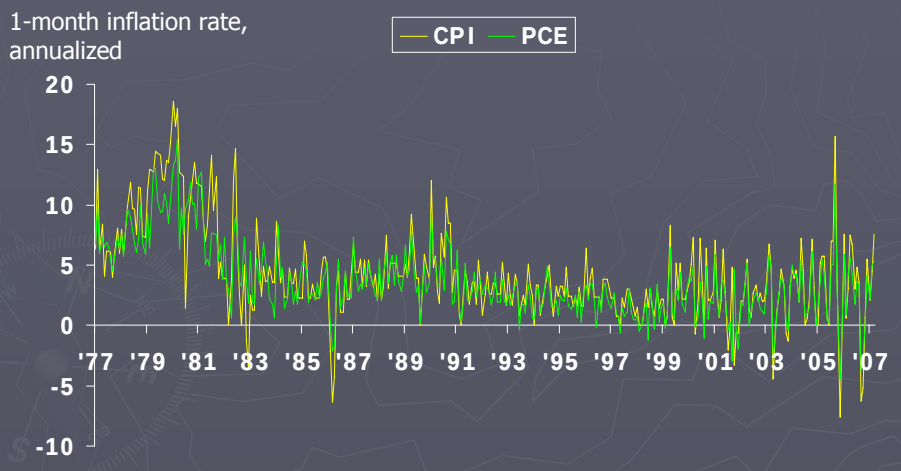
CPI inflation versus PCE inflation



Core inflation

- Former Fed Vice Chairman Alan Blinder: "The name of the game then was distinguishing the signal from the noise, which was often difficult. The key question on my mind was typically: What part of each monthly observation on inflation is durable and what part is fleeting?"

Monthly inflation data: very noisy



Core inflation

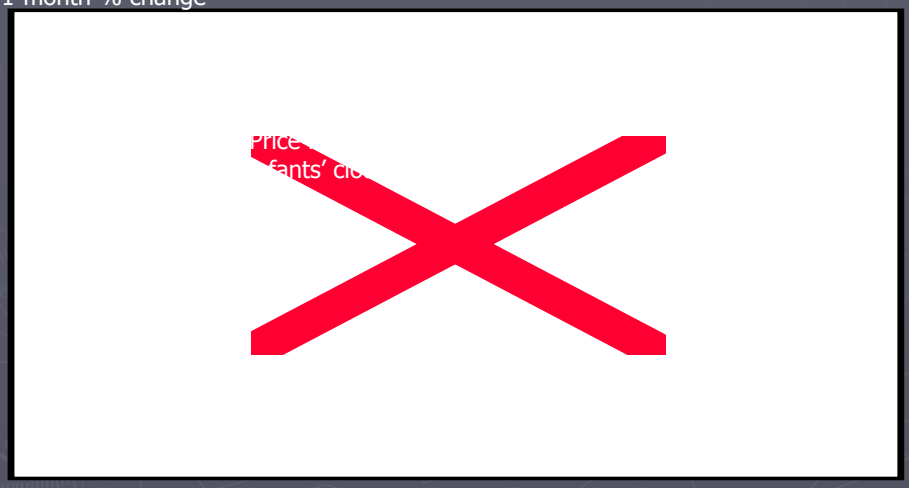
- Measures of core inflation try to get real-time picture of trend in inflation
- Why do policy-makers focus on it?
  - It's something policy-makers can control
  - Core measures (potentially) predict future headline inflation better than headline inflation itself

Measuring core inflation

- Oldest methods simply exclude certain items
  - Inflation "ex food & energy"
- Imperfect
  - Not all food & energy is "noisy"
  - Many other items are

Which item would you exclude?

1-month % change



Measuring core inflation

- "Ex food & energy" includes some noise, excludes some signal
- Can do better by being more discriminating
- Statistical technique: trimming
- Similar to scoring in Olympic figure skating
  - Take judges' scores, throw out highest, lowest
  - Average the remaining judges' scores

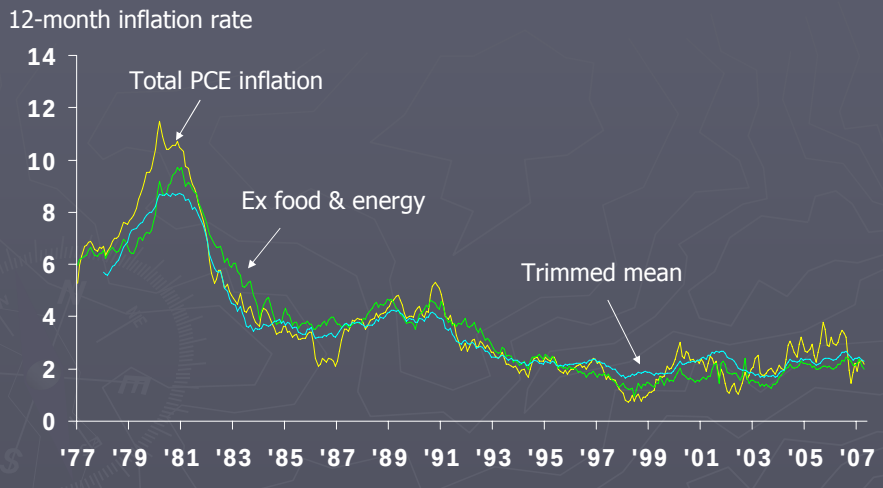
The trimmed mean PCE

- Excludes biggest price changes each month, regardless of whether food, energy, etc.
- Weighted average of remaining items
- Fixed trimming proportions, chosen to give best fit to trend PCE inflation
  - About 25% off top, 19% off bottom

How do trimmed means stack up against "ex food & energy"

- More accurate measures of trend inflation than ex food & energy
  - Research at Cleveland Fed (CPI), Dallas Fed (PCE)
- Provide earlier warning of breaks in trend inflation (CPI)
  - Recent work by M. Bryan, FRB Cleveland
- Better at forecasting future inflation (PCE)
  - Particularly at 2- to 3-year horizons

Total, ex food & energy and trimmed mean PCE inflation



Core PCE inflation: recent data

Why do we care about inflation?

- Because **money makes the world go round!**
- People use money for convenience, but ultimately care about goods
- If you contract in dollars, want to know what those dollars will buy

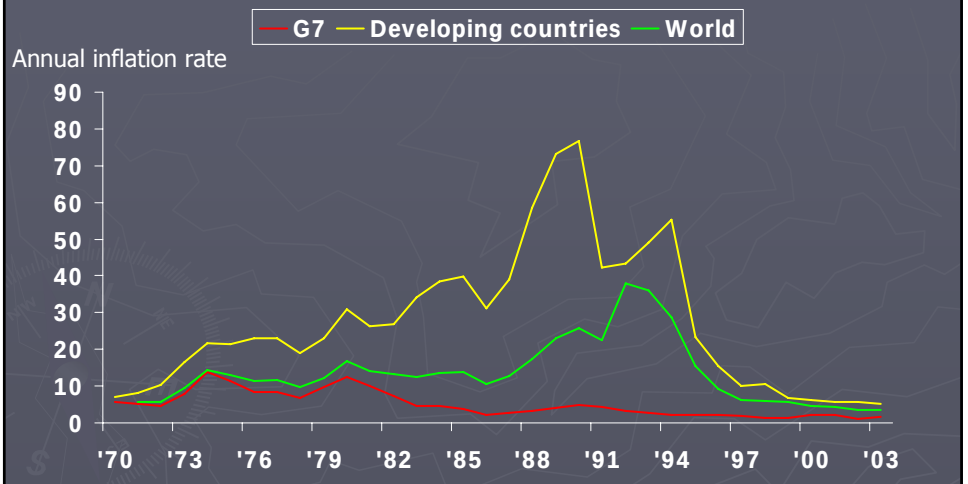
Why do we care about inflation?

- Surprise inflation causes problems with long-term contracting
  - Dollars you get/pay aren't worth what you expected
  - Inflation risk premium in long-term interest rates may be as much as 0.5-1.0 percentage points

Why do we care about inflation?

- Even perfectly anticipated inflation has costs
  - People economize on holding money
  - Firms must change prices more frequently
    - Cost of doing this surprisingly big
    - Supermarket data: 0.7% of revenue
- Costs of anticipated inflation more serious when inflation very high

Inflation has fallen worldwide



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