

Introduction to Public Management Economics

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Overview

Economic Theory and Economic Models

Economics

- Production, consumption, and distribution of goods and services among individuals and groups
- Efficient allocation of scarce resources that could have alternative uses to produce goods and services

Economic models

- Mathematical representation based on theory of individuals, firms, markets, or other economic activities
- Modeling only relevant features
- Testing of theory via empirical work

Macro- vs. Microeconomics

Macroeconomics

- National and international decision making and issues such as unemployment, interest rates, government spending, taxes, growth inflation, or trade

Microeconomics

- Individual decision making of individuals and firms
- Micro-foundations of (modern) macroeconomics

Public Management Economics

Mostly microeconomic concepts useful in public decision making (and everyday life)

- Consumer and producer theory
- Demand and supply
- Market structures
- Game theory, market failure, and uncertainty

Almost all of your decisions are based on economic principles.

- Important concepts such as marginal analysis and elasticities

Example topics:

- Benefits of parks, taxation, and environmental policy

Consumer and Producer Theory

Consumer behavior

- Utility maximization
- Derivation of the demand function
- Importance of consumer behavior in terms of welfare economics
- Effects of policy change on consumer well-being

Producer theory

- Profit maximization
- Cost minimization
- Derivation of the supply curve

Supply and Demand

Price and quantity that lead to a market equilibrium with neither excess demand nor excess supply

- How does demand (supply) changes when prices change?
- Changes in price and quantity versus changes in demand and supply

Examples

- Interaction among markets, e.g., market for high-end bicycles and carbon fiber
- Biofuel production (change in demand): Increase in corn ethanol production with spill-over effects to other markets

Market Structures

Perfect competition

- “Free Market”
- Price taking behavior

Monopoly and market power

- Price setting behavior

Imperfect competition

- Oligopoly: “Handful” of producers but many consumers
- Examples: Airbus vs. Boeing, car manufacturers, or insulin (see [AP EXPLAINER: Why is insulin so expensive and difficult to cap?](#))
- Strategic interactions among producers

Game Theory and Asymmetric Information

Overview

Key Economic Concepts

Real vs. Nominal Values

Game theory

- Strategic interactions among economics agents
- Players, actions, payoffs
- Examples: Auctions, bargaining, football, chess

Asymmetric information and signalling

- Used car market: Why is the number of photos important?
- Job interview

Market Failure and Uncertainty

Public policy and externalities

- Absence of markets, non-market valuation (e.g., lakes)
- Limitations to the free market, e.g., Gulf of Mexico Hypoxia

Uncertainty and Risk

- Consumer behavior under uncertainty
- Investment, time, and capital markets (e.g., retirement)

Key Economic Concepts

Marginal Analysis

Economics focuses on the margin to maximize total benefits net of costs. It's all about marginal benefit (MB) versus marginal cost (MC)

- If $MB > MC$, total benefit will increase.
- If $MC > MB$, total benefit will decrease.
- Total benefit will not rise or fall if $MB = MC$.

Example

- Speeding

Sunk Cost and Opportunity Cost

Sunk cost

- Expenditures that have been made and cannot be recovered.
- Since sunk costs cannot be changed, they should not influence decision-making.

Opportunity cost

- Value of the best alternative use of a resource, i.e., cost of forgone opportunities.
- For university students: Tuition plus the opportunity cost, i.e., salary forgone by not working
- Important but often ignored
- Relate to the concept of scarcity because once a resource has been used, it cannot be used for something else.

Elasticities

Related to the concept of supply and demand

- How does a percent change in price translates into a percent change in quantity?

Example of British railroads

- Accidents resulting in the death of passengers
- Multi-million dollar safety investment and subsequent price for financing purposes
- Switching of passengers from rail to road
- Based on traffic safety statistics: Increase in fatalities

Real vs. Nominal Values

Introductory Example

Time period 1:

- Income = \$100
- Price of apples = \$5 and 4 apples are purchased
- Price of milk = \$10 and 8 gallons are purchased

Time period 2:

- Income = \$120
- Price of apples = \$6 and 4 apples are purchased
- Price of milk = \$12 and 8 gallons are purchased

What about an income of \$110?

Index Numbers and Indices

Index Numbers

- Single value assigned to several individual numbers in order to quantify trends

Index

- Series of index numbers used for tracking over time
- For economics: Important concept to differentiate nominal and real dollar values

Examples

- Consumer Price Index (CPI)
- Dow Jones or SP500

Consumer Price Index

Definition by the Bureau of Labor Statistics (BLS)

"The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services."

Approximate weights in the market basket (about 80,000 items):

- Food and beverages (15%), housing (43%), apparel (4%), transportation (17%), medical care (6%), recreation (6%), education and communication (6%), and other goods and services (3%)

Tracking and reporting the price level

- Urban consumers represent about 87% of the U.S. Population

In economics: Only real values are used.

Construction of the CPI

Constructing the CPI using a market basket (MB)

$$CPI_t = \frac{MB_t}{MB_b} \cdot 100$$

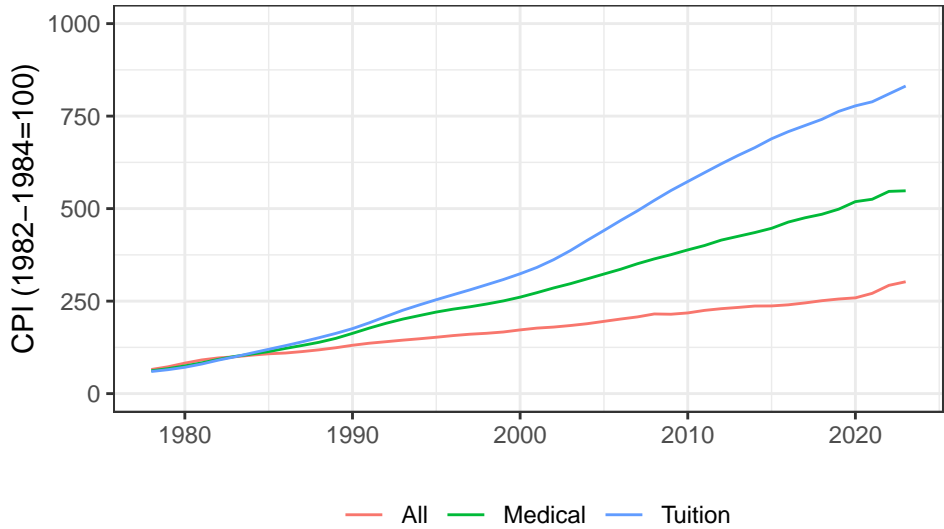
where MB_t and MB_b represents the cost of the market basket in the time period of interest t and the base year b , respectively. Example:

- $MB_t = \$71$ and $MB_b = 68$ then $CPI = 71/68 \cdot 100 = 104.41$.

Use of the CPI:

- Economic indicator, i.e., policy target
- Deflator of other economic series, i.e., translation from nominal to real
- Means of adjusting dollar values, e.g., pensions

Annual CPI of Various Categories



Constant Dollar Calculations: Formula

Constant dollar calculation:

$$CD_t = \frac{ND_t \cdot CPI_b}{CPI_t}$$

where

- CD_t : Constant dollar or real value
- ND_t : Nominal value in period t
- CPI_b : Consumer Price Index in the base period
- CPI_t : Consumer Price Index in period t

CPI source:

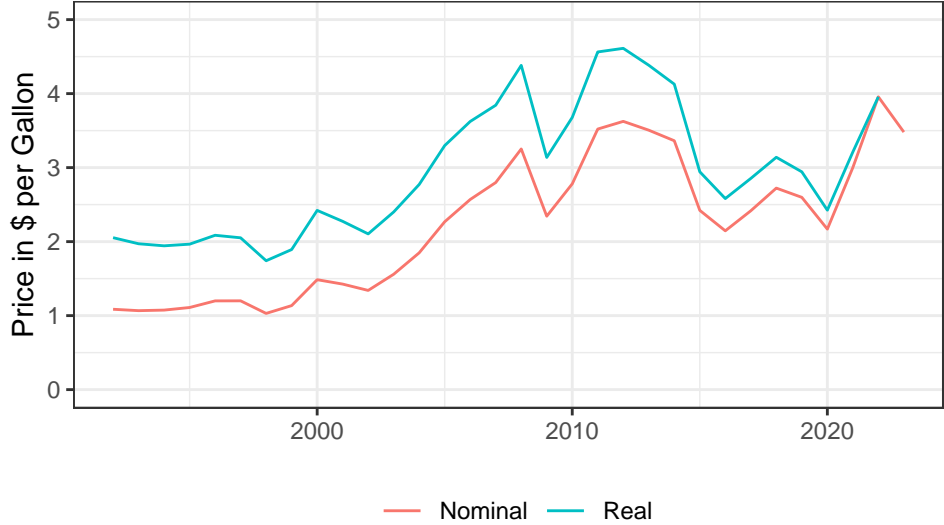
- [Data](#)
- [Calculator](#)

Constant Dollar Calculation: Example

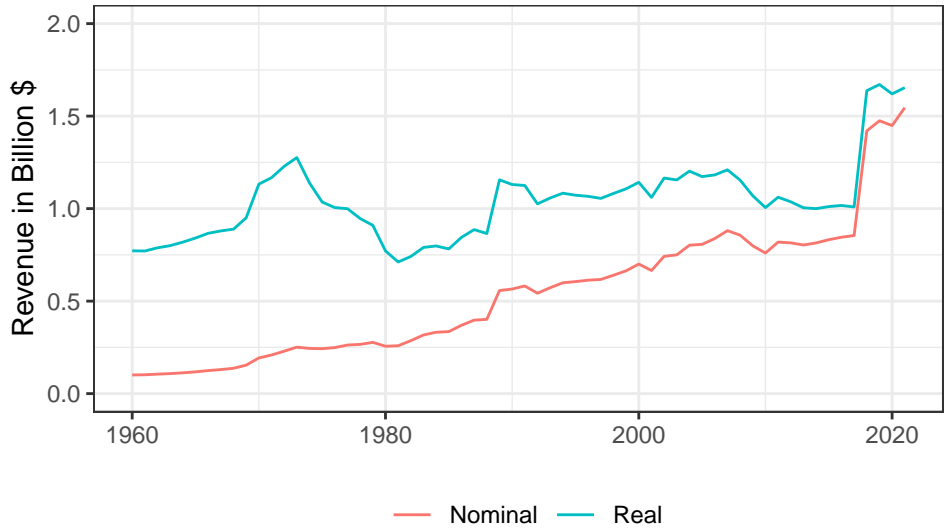
- May 1979: $ND_{1979} = 0.84$
- $CPI_{05/1979} = 71.4$ ($CPI = 100$ in 1982-1984)
- $CPI_{04/2022} = 288.663$
- $b = 04/2022$
- $t = 05/1979$

$$CD_{04/2022} = \frac{ND_{05/1979} \cdot CPI_{04/2022}}{CPI_{05/1979}} \Rightarrow \frac{0.84 \cdot 288.663}{71.4} = 3.40$$

Real vs. Nominal Prices: Gasoline Prices



Real vs. Nominal Prices: IN Fuel Tax Revenue



CPI and Inflation

Problems with the CPI:

- Substitution bias: consumers shift their purchases away from goods whose relative prices rise towards lower priced goods
- New technologies: when new, higher priced goods replace older goods
- Changes in Quality: failing to take into account of quality improvements that raise prices
- Growth in Discounting: with high prices, people switch to low-cost discount stores

The monthly inflation rate reported in the news is the percentage change in the price level over a 12 months period. The inflation rate can be calculated as follows:

$$\pi_t = \frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \cdot 100$$

Headline Inflation vs. Core Inflation

Food and energy prices are very volatile for example due to:

- Bad weather and subsequent decline in crop yields
- Fluctuations in oil supply triggered by OPEC

Economists usually exclude those items which results in “core inflation.”

- The figure of 4.2% represents “headline inflation,” i.e., include food and energy prices: CPI was 256.192 and 266.832 in April of 2020 and 2021, respectively
- Increase represents 4.2%

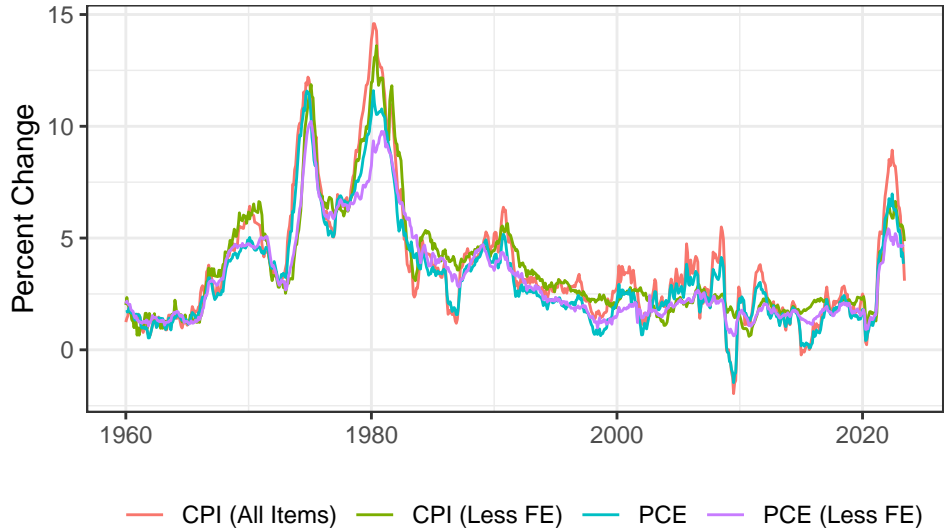
Personal Consumption Expenditure Index

Footnote of the Monetary Policy Report to the Congress (17 February 2000)

“[...] The chain-type price index for PCE draws extensively on data from the consumer price index but, while not entirely free of measurement problems, has several advantages relative to the CPI. The PCE chain-type index is constructed from a formula that reflects the changing composition of spending and thereby avoids [...] fixed-weight nature of the CPI. In addition, the weights are based on a more comprehensive measure of expenditures. Finally, historical data used in the PCE price index can be revised to account for newly available information and for improvements in measurement techniques, including those that affect source data from the CPI; the result is a more consistent series over time.[...]”

June 2022 PCE change: 4.8% (excluding food and energy)

Monthly CPI and PCE (Seasonally Adjusted)



Seasonal Adjustment (SA) of Retail Sales



Retail Sales (SA, Feb-1992 to present)

