# Introduction to Public Management Economics

Jerome Dumortier

# Economic Theory and Models

Economic theory

- 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

Almost all decisions are based on (micro-) economic principles

- Example: Getting out of bed in the morning

# Limitations and Power

## Limitations

- Narrow focus on neoclassical models and rational, self-interested individuals
- Often overlooks tools available to address financial instability and environmental pollution

## Power

- Framework for trade-offs and policy design to improve societal welfare
- Example: Compatibility of profit-maximization and environmental degradation correction through policy intervention to increase efficiency

## Next section

- Selected topics from AEA List of Real-World Economics
- Links to Research Highlights Article (RHA) and paper

# Array of Economic Topics I

- **Altruism**: Why do people give to charity? [RHA|Paper]
- **Asymmetric information**: What health choices do doctors make, and why are they different than most people's medical decisions? [RHA|Paper]
- **Cartel**: The NCAA might be a cartel [Paper]
- **Deadweight loss**: Gift exchanges tend to create deadweight loss [RHA|Paper]
- **Externality**: Electric cars export pollution to other states [RHA|Paper]
- **Financial crisis**: What does growing bank interconnectedness mean for future crises? [RHA|Paper]
- **Human capital**: What are the long-run benefits of public preschool? [RHA|Paper]
- **Incentive**: Do parents skew their children's birth dates for tax purposes? [RHA|Paper]
- **Inequality**: The rise of warehouse stores may explain why consumption inequality has not tracked an expanding income gap [RHA|Paper]

# Array of Economic Topics II

- **Market concentration**: The oligopolistic smartphone market isn't producing enough phones for consumers [RHA|Paper]
- **Signaling**: Why do restaurants with the best inspection reports keep their results a secret? [RHA|Paper]
- **Subsidy**: Should people receive subsidies to buy energy efficient light bulbs? [RHA|Paper]
- **Tax**: Scandinavian countries have high taxes but maintain economic growth. How? [Paper]
- **Technology**: To what extent can technological disruption lead to civil unrest? [RHA|Paper]
- **Trade**: What would ending NAFTA and Brexit do to car industries around the world? [RHA|Paper]
- **Unemployment**: The U.S. housing boom may have disguised a deeper decline in manufacturing [RHA|Paper]

# Public Management Economics: Overview

Microeconomic concepts for public decision making (and everyday life)

- Consumer theory
- Producer and cost theory
- Demand and supply
- Market structures
- Game theory
- Market failures and public policy
- Risk and uncertainty
- Dynamic aspects in economics

Case study topics

- Taxation, environmental policy, market structures, nonprofit management, among others

# Consumer and Producer Theory

Consumer behavior

- Utility maximization
- Derivation of the demand function
- Effects of policy change on consumer well-being

Producer theory

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

Importance of resource allocation of consumers and producers for welfare economics, i.e., the overall well-being of society

# Demand and Supply

Market equilibrium: Price and quantity with no excess demand or supply

- How does demand and/or supply change 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, i.e., change in corn demand: Increase in corn ethanol production with spill-over effects to other markets

# Market Structures

Perfect competition

- Price taking behavior due to many consumers and many producers
- Benchmark for efficiency

Market power

- Monopoly and monopsony as price setting behavior by single producer or consumer, respectively

Imperfect competition

- Oligopoly: Few 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

Concept

- Strategic interactions among economic agents
- Three components to every game: (1) Players, (2) actions, and (3) payoffs

Examples in the context of public affairs and public administration

- Competing political parties with similar policy goals (e.g., budget allocation) for which cooperation could benefit both
- Strategic behavior by voters choosing candidates not based on preferences but on expected outcomes
- Citizens benefiting from public goods without contributing (e.g., clean air) leading to government intervention to reduce free-riding, e.g., taxes, regulations
- Government agencies competing for resources and political support leading to strategic decisions on policy implementation to align with incentives

# Market Failures and Public Policy

Failures to efficient resource allocation and potential remedies

- Positive and negative externalities: Regulation, Pigouvian taxes, tradable permits
- Public goods (e.g., national defense, street lighting): Government provision, taxation
- Imperfect competition (e.g., monopolies, cartels): Antitrust policy, price regulation
- Asymmetric information (e.g., health insurance markets): Mandates, disclosure rules, regulation
- Missing Markets (e.g., clean air, clean water): Non-market valuation, conservation programs

# Risk and Uncertainty

## Concepts

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

## Examples

- Insurance markets (e.g., health, crops) and government role (e.g., subsidies)
- Investment decisions: Uncertainty in firms' future demand
- Household behavior: Savings and retirement under uncertain income
- Consumer decisions: Uncertainty in product quality addressed by labeling, safety standards

# Dynamic Aspects in Economics

Net present value (NPV)

- Compounding, discounting, and the value of money over time

Intertemporal decision making

- Shifting of consumption across time periods via saving and borrowing
- Time preferences and consumption smoothing

Natural resource extraction

- Optimal management of renewable (e.g., fisheries and forestry) and non-renewable (i.e., depletable) resources

# Marginal Analysis

Focus on marginal analysis: Maximize benefits net of costs

- If $MB > MC$, total benefit will increase
- If $MC > MB$, total benefit will decrease
- Total benefit will neither rise nor 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
- University example: Tuition plus forgone salary
- Important but often ignored
- Relates 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 translate into a percent change in quantity?

Example of transportation choice

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

# 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 S&P 500

# CPI, PCE, PPI, and GDP Deflator

Consumer Price Index (CPI)

- Price tracking of consumer goods

Personal Consumption Expenditure (PCE) Price Index

- Calculations based on technical differences compared to CPI

Producer Price Index (PPI)

- Tracking of prices paid by producers
- Example: Difference in electricity prices paid by industry versus consumers

GDP Deflator

- Goods and services purchased by businesses, governments, and foreigners.
- Tracking of price changes for imported goods
- Significantly broader compared to CPI, PCE Index, and PPI

# 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 90% of the U.S. Population

In economics: Only real values are used

# Difference between CPI and PCE

White House Council of Economic Advisers (29 September 2023):

> *For example, both CPI and PCE measure the price of airfare, but CPI calculates it using a fixed basket of air routes, while PCE calculates it using data on airline passenger revenues and passenger miles traveled.*

Monetary Policy Report to the Congress (17 February 2000):

> *The [. . . ] PCE draws extensively on data from the but, while not entirely free of measurement problems, has several advantages relative to the CPI. The PCE [. . . ] 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, [. . . ]; the result is a more consistent series over time.*

# Construction of the CPI

Constructing the CPI using a market basket (MB)

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

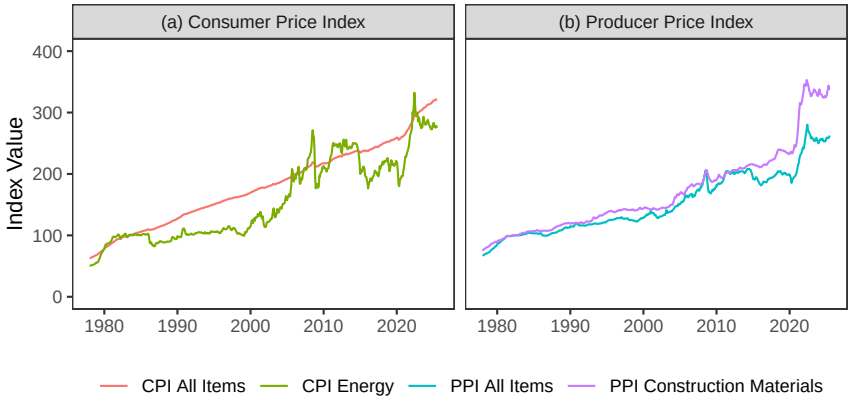
where $MB_t$ and $MB_b$ represents the cost of the market basket in the time period of interest $t$ and the base year $b$, respectively. Example:

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

Use of the CPI:

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

# CPI and PPI Evolution



# 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

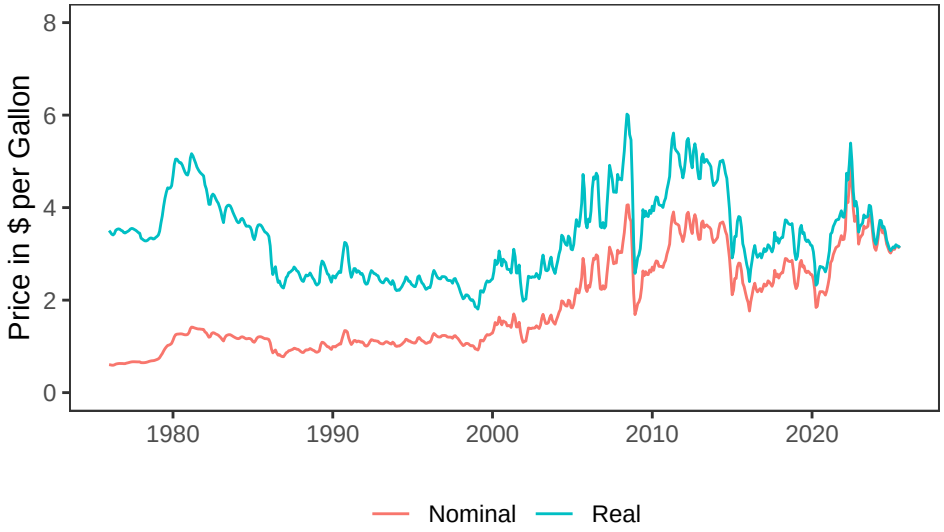
- Data
- Calculator

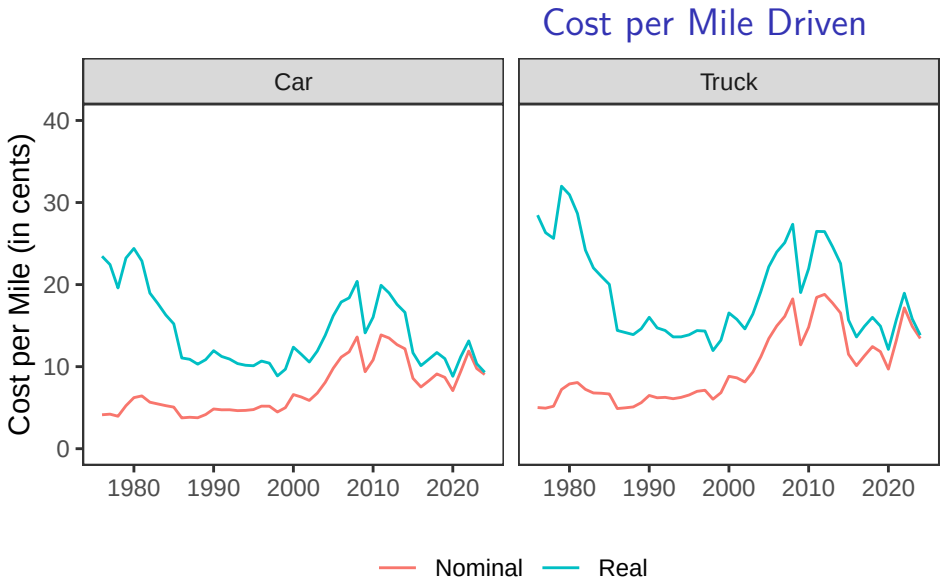
# Constant Dollar Calculation: Example

- May 1979: $ND_{1979} = 0.84$
- $CPI_{05/1979} = 71.5$ ($CPI = 100$ in 1982–1984)
- $CPI_{07/2025} = 323.048$
- $b = 07/2025$
- $t = 05/1979$

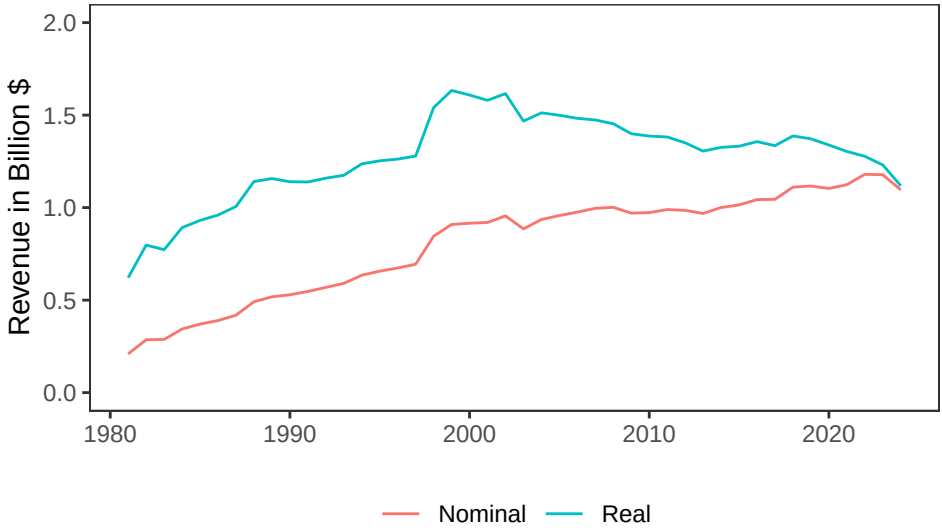
$$CD_{2025} = \frac{ND_{1979} \cdot CPI_{2025}}{CPI_{1979}} = \frac{0.84 \cdot 323.048}{71.5} = 3.80$$

# Real vs. Nominal Prices: Gasoline Prices




Cost per Mile Driven
Car
Truck
Cost per Mile (in cents)
0
10
20
30
40
1980
1990
2000
2010
2020
Nominal
Real

# Real vs. Nominal Prices: WI 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

- 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., including food and energy prices): CPI was 256.192 and 266.832 in April of 2020 and 2021, respectively
- Increase represents 4.2%

# Monthly CPI and PCE