

Introduction

Price Theory (ECO 3301)

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SMU

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Welcome!

- Let's get to know each other.

Housekeeping

- Javier Gonzalez (gonzalezjj@smu.edu)
 - I will only answer emails during *work hours*.
 - Let me know if I haven't replied to your email.
- Office Hours: 13:00-14:00 (or after?)
 - In person: Hyer G25.
 - Virtual: Zoom meeting by appointment.

Housekeeping: Class Dynamics

- Motto of this class: **Learning by doing**
- A typical class will have the following structure
 - 2:05-3:20 → Lecture
 - 3:20-3:30 → Break
 - 3:30-3:40 → Individual work on a problem
 - 3:40-3:50 → Discussion of the problem
- I ask a lot of questions to make you think.
 - I ask stupid questions every day, so don't be shy!
- I have poor grammar. PLEASE correct me.

Housekeeping: Grades

- Problem Sets (20%) due each Wednesday (total of 4)
 - we will solve the PS together on Thursday in class.
- Midterms 1 (25%) and Midterm 2 (25%)
- Final Exam (30%)
 - cumulative with a focus on the last topics discussed in class.

Housekeeping: Important Dates

Date

May 31 Problem set 1

June 7 Problem set 2

June 9 Midterm 1

June 14 Problem set 3

June 21 Problem set 4

June 23 Midterm 2

June 28 Final Exam

Housekeeping: Bonus Points

- Bonus points (up to 10%)
 - (max of 6) In the first 5 mins of each class I will ask questions on the board about previous lectures. The first student with the correct answer will be awarded 1 bonus point.
 - (max of 4) Take a newspaper article and try to explain it using the models we'll see in class.
 - Analysis with only demand and supply curves will not be enough.
 - I will present an example at the end of this class.

Price Theory?

What is the role of prices in an economy?

What is the role of prices in an economy?

- Prices are a mechanism to allocate resources between agents.
- These allocations will depend on many things:
 - What are the tastes of people (preferences)
 - How rich are the agents (budget or initial endowments)
 - How costly it is for the firms to produce a good (production costs)
 - Level of competition in the market (monopoly)
 - Government interventions (taxes, quotas, regulation)

Other ways to allocate resources

- Economists are also interested in how to allocate resources without using prices.
- Some examples:
 - Loteries for charter schools
 - Draft for new players in some sports leagues
 - Trading organ transplants
- Prices and markets are common and a good baseline.

Course Content

Benchmark Models

- Consumer Theory
 - Assume perfect information, no transaction costs, rational agents, no externalities.
 - Consumers maximize utility.
 - We can then get to consumer demand - how consumers choose between goods.
- Producer Theory
 - Assume perfect competition (many small firms), no externalities.
 - Firms maximize profits.
 - Get to the firm supply - how firms choose what to produce.

Welfare within Benchmark Model

- Competition and analysis of benchmark model.
 - Market equilibrium price and quantity.
 - Welfare: consumer and producer surplus.
- *Pareto efficiency*:
 - the point where it's impossible to make everyone better off.
- **First Welfare Theorem**:
 - Market equilibrium leads to a Pareto efficient outcome.

Market Failures

- The assumptions required for the First Welfare Theorem may not hold.
- Imperfect Competition
 - Monopoly, oligopoly (water provision, user data and tech firms)
 - Intervention: Antitrust and Consumer Protection Institutions
- Externalities
 - Positive externalities (education, vaccines)
 - Negative externalities (pollution, mask and COVID)
 - Intervention: taxes, subsidies, or quotas

Market Failures

- Imperfect Information
 - Asymmetric information (used car sales, experts services)
 - Signaling (education, advertising)
 - Intervention: standards and certification, verifiable contracts
- Redistribution
 - Pareto efficient outcomes can be inequitable
 - Interventions: taxes and transfer system
- Agents are not rational (not rational \neq stupid) *
 - Procrastination (overweight, saving for retirement, students with problem sets)
 - Loss aversion (toxic couples, taxis driving longer on rainy days)
 - Interventions: nudges, taxes, regulation

Economic Models

Models

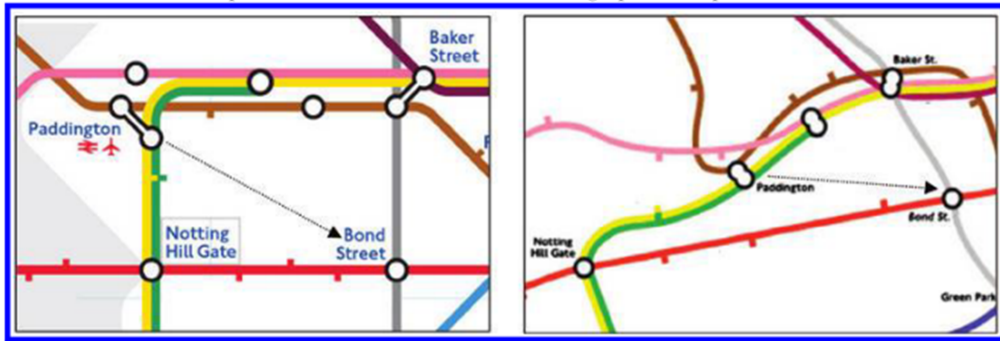
- Economic models are
 - a simplification of reality
 - they can't explain everything
 - often mathematical or graphical
 - tools used to explain or predict a particular phenomenon
 - highlights the key trade-offs

Models

Figure 1

A: Schematic Tube map

B: Geographical map



Source: (Nagaraj and Stern, 2020)

Models

- Economics is a collection of models (tools) to apply to different contexts
 - Each with its **critical assumptions** and mechanisms
 - The right model is the one that applies to the right situation
 - You have to combine theory and detailed knowledge of your setting
- Why math?
 - Markets are complicated with many moving pieces, and models help us isolate different components and their interactions in a tractable way
 - You need to be specific and explicit to avoid ambiguity or different interpretations.

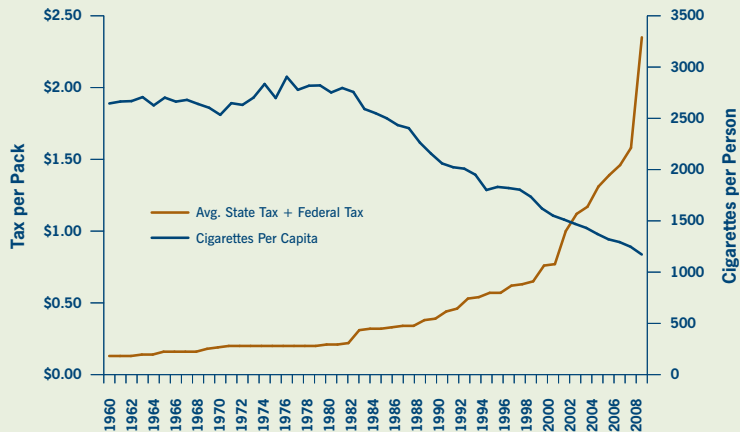
Example: “Sin” Taxes

“Sin” Taxes

- Governments tax goods that are deemed harmful
 - Alcohol
 - Tobacco
 - Sugar (soft drinks)
- In general, taxes on specific goods are falling (Gruber, 2007)
 - Specific taxes made up 12.8% of gov’t revenue in 1960
 - 3.2% in 2005
- “Sin” taxes are increasing
 - Between 2010 and 2017, more than 20 states increased tobacco taxes
 - Many are considering taxes on sugar or marijuana
 - Alcohol taxes are relatively stable

Cigarette Tax

Figure 1. Trends in Cigarette Taxes and Cigarette Consumption

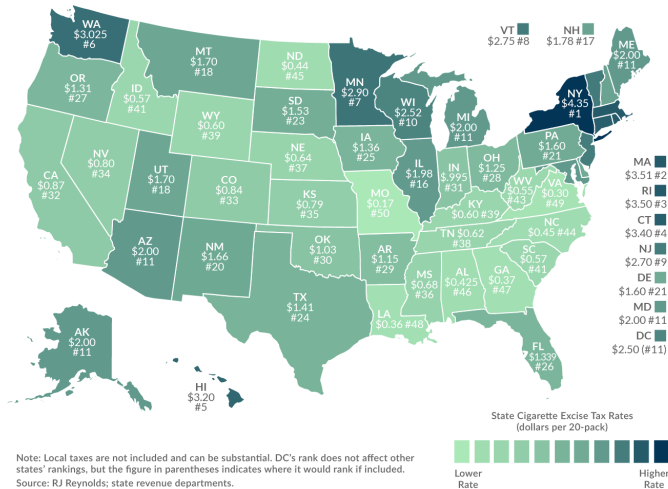


Source: Orzechowski and Walker. "The Tax Burden on Tobacco: Historical Compilation." Volume 43, 2008.

Cigarette Tax

How High Are Cigarette Taxes in Your State?

State Cigarette Excise Tax Rates as of Jan. 1, 2015 (dollars per 20-pack)



Questions about what we see

- Why impose higher taxes on cigarettes than other goods?
- What are the trade-offs of increasing the tax? Who wins who loses?
- Why do we have differences across states?

Economic Approach

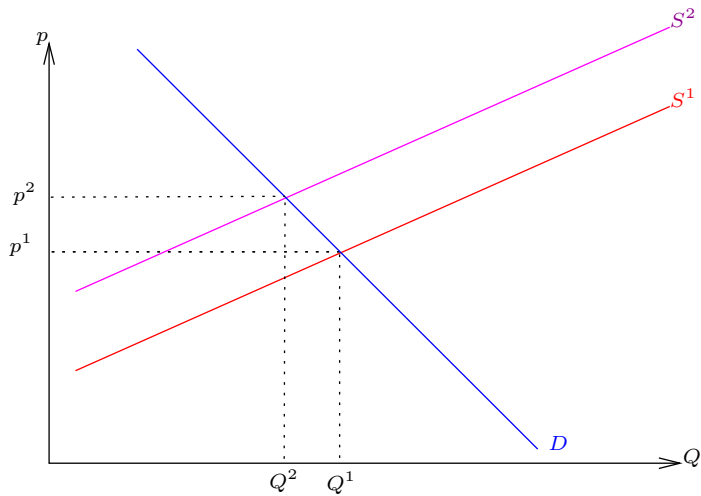
Economic Approach

- Start with a benchmark theory
 - Perfect competition
 - No externalities
 - Fully informed consumers
- Add the relevant complications

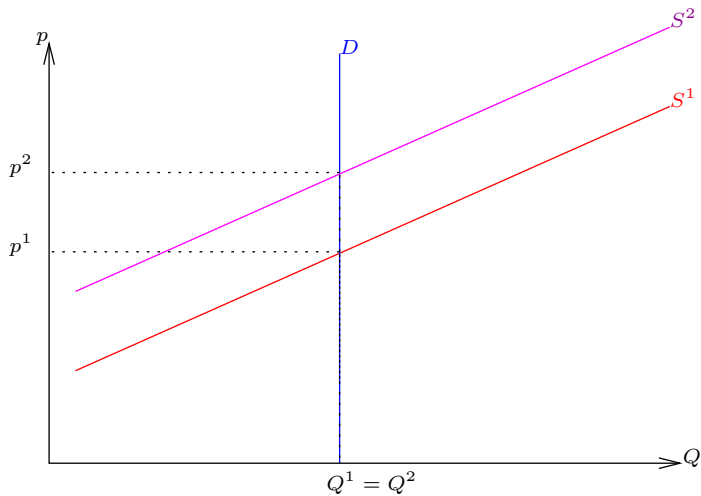
Economic Approach: Benchmark

- If
 - Cigarette consumption is rational and fully informed,
 - AND it causes no harm to others
- Then
 - There is no special reason to tax cigarettes more than other goods
 - No need for “corrective” taxation
- Apply insights from optimal taxation
 - Tax inelastic goods more
 - We need to know the elasticity of demand and supply of goods

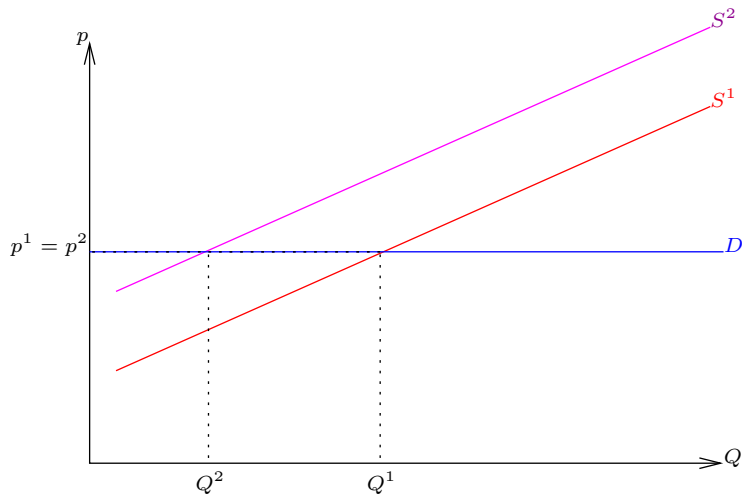
Elasticity



Inelastic Demand



Perfectly Elastic Demand



Economic Approach

- Economic theory of taxation
 - The costs of taxation depend on the price elasticity of consumption
 - Elasticity - how demand responds to price changes
- Consensus estimates between 0.4-0.5 (some up to 0.6)
- Higher for lower income (elasticity roughly 1)
- Higher cig taxes may reduce alcohol consumption (Gruber, Sen, Stabile 2003)
 - suggest that cigarettes and alcohol are complements

Economic Approach: Benchmark

- If
 - Cigarette consumption is rational and fully informed
 - AND it causes no harm to others
- Then
 - There is no special reason to tax cigarettes more than other goods
 - No need for “corrective” taxation
- Which one of these seem to not hold?

Economic Approach: Externalities

- Theory: Effects of taxation in the presence of negative externalities
 - Negative externality - cost on a third party (social costs)
- General principle: adjust the private costs to reflect social costs
- Social costs of smoking
 - Public health care costs (Medicare, Medicaid)
 - Second-hand smoke is as harmful as first-hand smoke in health outcomes

Viscusi (1999) - Cots per Pack

TABLE 1
SOCIAL COSTS OF SMOKING IN 1995

	REAL RATE OF INTEREST		
	0%	3%	5%
No tar adjustment:			
Total medical care	.7542	.5804	.5333
Sick leave	.0000	.0134	.0207
Group life insurance	.2539	.1439	.0965
Nursing home care	-.6325	-.2390	-.0801
Retirement pension	-3.0458	-1.2589	-.3857
Fires	.0149	.0167	.0189
Taxes on earnings	.9321	.4247	.1288
Total net costs	-1.7232	-.3186	.3323

Economic Approach: Externalities

- Social costs of smoking are relatively small
 - Are there other assumptions that we can relax in this context?
- Less is known about second-hand smoke
- Caveat: These calculations are dated. There are more recent estimates
- Relatively large social costs for drinking

Summary

- Theory gives us a framework to analyze “sin” taxes
- Write a model to isolate important aspects:
 - Consumer demand
 - Negative externalities
- Go to data to estimate parameters and test the model
- Back to model to draw implications
 - What do estimates imply about policy?
 - Are there other assumptions that we need to relax?

Newspaper Application

Newspaper Application

SHOTS - HEALTH NEWS

Adderall shortage forces some patients to scramble, ration or go without

February 18, 2023 · 7:00 AM ET

Heard on [Weekend Edition Saturday](#)

SYDNEY LUPKIN

Newspaper Application: Adderall

- Summary:
 - There's been an Adderall shortage for five months
 - One month shortage for its generic versions
 - Prescriptions for Adderall doubled (from 7% to 15%) after the pandemic
 - DEA has set quotas for Adderall and generics before a surge in prescriptions
- Assumptions
 - Consumers: rational, and no transaction costs
 - Firms: perfect competition, only produce 1 product, and unlimited capacity

Newspaper Application: Adderall

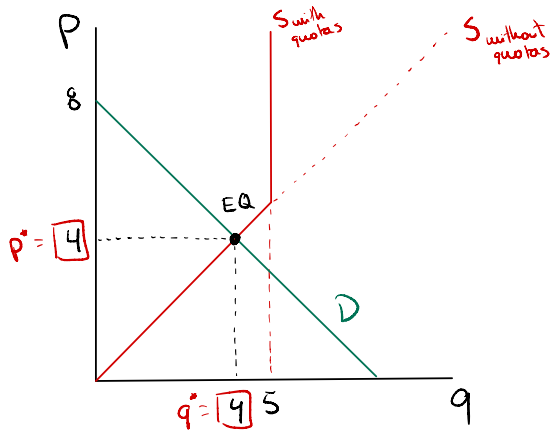
- I want to show how **quotas** can create **shortages**
- Suppose there is an initial consumer demand for Adderall

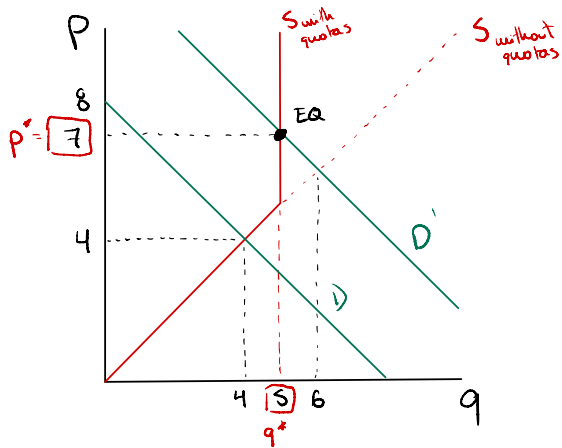
$$p_d = 8 - q_d$$

$$p'_d = 12 - q'_d$$

- Firms have a quota that they can't produce more than that amount. Thus, the supply curve is given by

$$p_s = \begin{cases} q_s & \text{if } q_s < 5 \\ [5, \infty) & \text{if } q_s \geq 5 \end{cases}$$





Newspaper Application: Others Q's

- Why does the government fix production quotas?
 - Adderall might have adverse effects if consumed in high quantities.
 - Adderall production companies have a monopoly on this product.
- Are Adderall and their generic versions perfect substitutes?
 - Notice how I did not model any secondary markets for generic versions of Adderall.
- Does the shortage reduce consumer welfare?