

Payment in Accordance with Product

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Introduction

Today things get interesting: market failures and solutions

- 1 Idea of an externality
 - Missing market price means some costs ignored
 - To solve, target specifically the relevant market
- 2 Surprising externalities and non-externalities
 - Pecuniary externalities and internalities
- 3 Public policy solutions to externalities
 - Pigouvian taxes, cap and trade and the legal system
 - Trade-offs between different approaches
- 4 Stigler's Coase Theorem and bargaining solutions
 - With property rights, parties bargain to efficiency
 - In some cases, this or other private solution works but...
- 5 Flaws in the Coase Theorem and the information problem
 - Many exist because some authority can get better info

Missing prices and the externality problem

Why did we find market mechanism worked so well?

- If I want to eat more fancy dinners, I have to pay
- What I pay is opportunity cost to others of that dinner
- If I do a job, I get paid what that produces for others
 - I get paid/pay what I give to/receive from others
- This is called *payment in accordance with product*
 - Any time this doesn't happen, we say I exert *externality*
 - Called this because it is *external* to the price system
 - Examples?
 - 1 Playing music loud at night which drives neighbor crazy
 - 2 A beautiful building that people love to look at
 - 3 Pollution
 - 4 Generating new ideas
 - 5 Crime

Mathematical example of externalities

A simple example is smoking

- 100,000 people in downtown Chicago each day
- 10% are smokers, worth $\$3s - \frac{s^2}{10}$ to smoke s
- Cigarettes price, before taxes, is \$1
 - How much will smokers smoke?
 - $\frac{s}{5} = 3 - 1, s = 10.$
- Other 90% each get utility $-\frac{1}{100,000}$ from each cigarette
 - What would be optimal amount of smoking?
 - There are 90k, so total disutility is \$.90 from each cigarette
 - Thus social benefit of smoking only $1.1 - \frac{s^2}{10}$
 - Socially optimal is $s = 5.5$, not 10!
- Problem: smokers don't have to pay for harm from smoking
- Today we'll talk about various ways of making them

Graphical example of externalities

Pigou's Principle

More generally, if people are different, maximize total

- Take into account *total externality*
 - Add up over all affected amount of harm done
- Pigou's Principle of Payment in Accordance with Product:
 - 1 People must pay average externalities of their actions
 - Not just economics, but common sense
 - Pay for all the (average) consequences of actions to others
 - Markets make you do this for many things
 - Externality policy forces when market missing
 - Only way to insure you generally have the right incentive
 - 2 Solutions to externalities should *focus on missing price*
 - Do not just do anything which addresses problem somewhat
 - Focus specifically on the problem
 - Contrast: fiscal policy gives people money, hope they spend
 - Instead money *for spending it*: cyclically varying sales tax

Pecuniary externalities should not be “internalized”

Imagine I discover a giant hoard of gold

⇒ Gold prices fall, other people who own gold worse off

- Is this an externality?
 - In some sense, but for each owner harmed, buyer gains
 - Because *mediated through price system* no net loss
 - Unlike a “real” or “technical externality, no inefficiency
 - Thus we *should not* internalize *pecuniary externalities*
- Common misapplication of theory of externalities:
 - 1 Competition harms existing firms by lowering price
 - What if takes profitable sales without lowering price?
 - 2 Free trade with China causes steel workers to lose job
 - 3 Polluting a lake harms consumers as price of fish rises
 - Who is the real victim of the externality?
 - 4 Brilliant roommate getting stoned helps you beat curve
 - 5 Selective abortion benefits women as now scarce

Physical v. pure economic damages

This distinction shows up in damages distinction:

① *Physical damages:*

- You hit doctor with a car, burn down house
- You defame someone's character with libel
- These are *direct (if not physical) harms*

② *Pure economic loss:*

- Patients no longer have doctor, home values rise
 - If other home values fall because house beautiful?
- These are *indirect, price-mediated economic harms*

Major issue during Deep Water Horizon; classify:

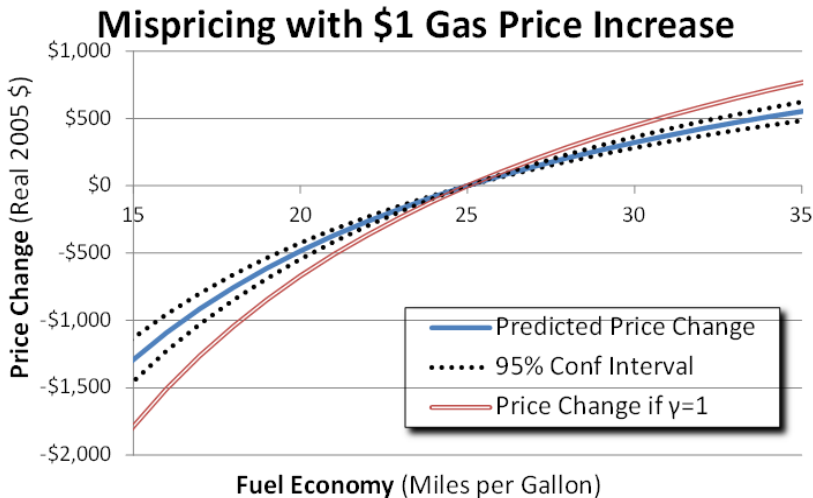
- ① Shrimping employees who lose their job?
- ② Government conservation agencies in charge of birds?
- ③ Louisiana hotels serving industry?
- ④ Disrupted shippers through the port?

Internalities and paternalism

So not everything across people is real externality

- Conversely, not everything within people is “fine/efficient”
- Individuals neglect/ignore/impose costs on (future) self
- These are called *internalities* and policy called *paternalism*
- Same idea as market: not fully/properly accounted for
- Large areas of policy determined by these considerations
 - ➊ Addiction and drugs
 - Many believe addicts would be better off quitting
 - This justifies a range of sin taxes, prohibitions, etc.
 - ➋ Forced savings and social security
 - “Tempted” not to save, but better off saving
 - ➌ Energy efficiency and CAFE standards
 - Alcott-Wozny (11): consumers don't respond to energy costs
 - Efficiency mandates good, and bigger than externality
 - ➍ Suicide, organ donation and prohibitions on markets

Allcott-Wozny (2011) on effect of gas on car prices



Pigouvian subsidies and taxes

Most economists' favorite response to externalities

- If there is an external harm, tax the activity
 - External benefit: subsidize (usually tax system)
 - Simple solution directly creates prices for activity
 - Tax must be *marginal externality at optimal level*:
 - Otherwise doesn't play same role as price
 - However, setting constant at this level may be inadequate
 - Consider *network externalities* from fax machines
 - The more people that use them, the more valuable they are
 - Long time to take-off: too costly absent network effects
- ⇒ Better to subsidize more early on
- This ensures that optimal number get on
 - Later you can offer just marginal optimal subsidy
 - This is exactly what many internet companies do
 - Lose money early, make it up later: *insulating tariff*

Carbon and other pollution taxes

Most common practical application is taxes for pollution

- 1 Effluent tax (inspections) proposed by Lawrence White
 - All cars have clean technology, but only relevant in cities
 - Why not have localities charge local average Pigouvian tax?
- 2 French pollution taxes
 - In France, all power plants/other polluters pay
 - Measured from smoke stacks, price for each category
- 3 Carbon tax
 - We'll talk much more Thursday, but used in Europe

Economists almost always prefer to direct regulation; why?

- Regulation more costly because doesn't target issue
- Some much more efficient at reducing than others
- Fowlie et al. (2011): could save \$2 billion on NOx reduction
 - Cars unregulated, while fixed source highly regulated

Graphical representation of Pigouvian tax

Collecting Pigouvian taxes through the legal system

In US many (most) Pigouvian taxes through legal system

- When a firm or individual causes harm, they get sued
- Court assesses how much harm was caused
- Individual causing harm must pay:
 - 1 Compensatory damages
 - These directly redress harms caused
 - 2 Punitive damages
 - These deal with imperfect detection
 - Also may deal with lack of care by plaintiff
 - Not all paid to plaintiff, some to the state
 - More on this in problem set
- Anglo-Saxon system incorporates Pigou!
 - Not everything can be covered in statutes
 - Greater litigiousness v. Europe reflects PIAWP
 - Most paid by negotiation, settlement

Cap and trade: an example of equivalence

Instead you can mandate quantity of activity, allow trade

- Put maximum on pollution, auction (or assign) rights
 - Or minimum if positive externality
- Let's return to smoking example:

- Pigou would tax at \$9 per cigarette
- Alternatively, cap total cigarettes sold at 55,000
- Supply is now perfectly inelastic at 55,000
- Demand is $\sum_{i=1}^{10,000} 5(3 - p) = 150,000 - 50,000p$
- What is equilibrium price of cigarettes?
 - Rises to $\frac{95,000}{50,000} = 1.9$, same as with tax!

- ⇒ Cap at optimal quantity equivalent to optimal tax
- Generally true because of definition of market optimality
 - Adding the price leads to optimal quantity
 - Implementing optimal quantity requires price

Example of equivalence

Commonly proposed for pollution

- Allow people to trade, price for right to pollute
 - Most efficient mitigators sell permits to least
- If set at efficient level, price must be same as tax
 - ⇒ Equivalent, for most intents and purposes
- Particularly obvious with an auction
 - But often proposed instead of tax for politics
 - To buy political support, pay off those hurt
 - Hard to do with taxes, because looks like blatant giveaway
 - Giving out credits seems more just, cover for bribes
 - ⇒ Cap and trade more popular for global warming
- Putting aside such politics, economic logic favoring one?

The logic of prices v. quantities

Problem: decisions on prices v. quantities locked in

- If marginal externality independent, known, use tax
 - Marginal cost of externality flat (elastic)
 - Marginal cost of mitigation extremely steep (inelastic)
 - Local externalities (flat), smoking (steep mitigation)
 - Why most small torts use legal system
- If optimal quantity independent, well-known, use quantity
 - Marginal externality extremely steep (inelastic)
 - Marginal mitigation cost extremely flat (elastic)
 - Congestion (steep externality), lead in gas (flat mitigation)

Graphical illustration of price-quantity trade-off

Property rights and the bargaining solution

These are all public, “government led” solutions

- But some have suggested such are not needed
- As long as *property rights* clear, bargain to efficiency
 - Your neighbor makes lots of noise at night
 - Efficient outcome is a little bit of noise, but not much
 - If he has right to make as much noise as he wants...
 - You can pay him to shut it off
 - If you have right to quiet...
 - He can pay you for noise he makes
 - Either way reach (effectively same) efficient bargain
 - Why any need for government solution?
 - In fact, always some *de facto* property rights
 - So shouldn't externalities solve themselves?

Stigler's Coase Theorem

This logic is “Stigler's Coase Theorem”

- Also called “Coase's Theorem” or “The Coase Theorem”

Stigler's Coase Theorem

If there are no “transactions costs of bargaining”, then efficiency always results. If income effects are small, the outcome is independent of the assignment of property rights.

- What is a transaction cost of bargaining?
 - Basically, anything that impedes efficiency
 - ⇒ Just a tautology, reminder to think of bargaining
 - “All is for the best in the best of all possible worlds”
- Nonetheless, useful guide in some cases

When do bargaining and merging work?

Bargaining usually works well when:

- 1 Small number of people
- 2 Have relevant info (or more than government/courts)
- 3 Know/can find one another

Often bargaining facilitated by long-term relationship (merger)

- 1 Condominium associations, company towns
- 2 Cooperative firms and European Union

But such “mergers” obviously don't always work

- Still internalities, conflicts within firms and organizations

And not always good: also pecuniary externalities

- Particularly when one side concentrated, other diffuse
 - 1 Mergers by competing firms
 - 2 Industry-wide lobbying groups
 - 3 Packs of popular girls in high school

Monopolistic “private” solution

Sometimes the private sector can also solve by monopoly

- Monopoly provision of network goods internalizes
 - Fax might have established faster if someone had interest
 - Newspapers offered free to consumers
 - Helps internalize externalities to advertisers
 - Useful in short-run, if monopolist knows something
 - Helps market get over the hump
 - 1 Network externalities
 - 2 Spillovers in production (knowledge, ideas and cities)
 - But in long-run cannot overall lower price
 - Monopolist always wants to make a profit
 - Will never produce at or below average cost
 - Competitive market will often produce at average cost
- ⇒ In long-run, monopoly always supplies less

Information and the failure of bargaining

Despite potential benefits, Coase Theorem mostly misleading:

- ① Adding good Pigouvian intervention can only help
 - Bargaining still possible (settlements for lawsuits)
 - When bargaining fails, Pigouvian intervention backstops
 - ② Many externalities very diffuse, bargaining impossible
 - How could everyone bargain over harms to climate?
 - ③ Most importantly, *information* usually diffuse
 - Consensus of experts much better on climate change
 - Each individual affected has very little information
 - Even with bargain, unlikely to reach very efficient outcome
- ⇒ At best bargaining only as good as information
- Always ask, “who knows best about this market failure?”
- ⇒ Coase Theorem says little (if anything) against intervention
- Reminds us there are many solutions, bargaining may help

The externality problem as a problem of information

Thus real problem is how to obtain right information

- This is theme of our next class
- Typically: some information diffused, some expertise
- Problem of externality design: how to combine these well
- Trade-offs crucial, relative importance determines policy
- Simplistic answer, like Coase Theorem, ignore these
- Next class will hopefully gird you against such naïveté