

Environmental Economics

- Incentives-based Approaches to Environmentalism
 - Environmental economics is a **sub-discipline** of economics, interested in environmental problems
 - The basic premise of economics as a discipline is that humans are **rational** agents who respond to market signals like prices, opportunities, and other **incentives**
 - Therefore, the goal of environmental economics is to **adjust market-signals** in order to **incentivize** people to act in environmentally sound ways, but for their **own** motives, perhaps without even being aware of it!
 - Do something for their own interest
 - Put the incentives to make them act green
 - In other words, environmental economics attempt to address and correct **market failures** like **negative externalities**, **underpricing** of natural resources
 - Environmental economist see the human economy as within the environment, receiving resources and services from it ==> Environmental view of economic approach
 - One easy example:
 - Two detergents => Tide (phosphate included) vs eco friendly one
 - Green tax => +20% tax on phosphate detergents ==> **Green tax**
 - Gov subsidies green detergents => -20% tax on green detergents ==> **Green subsidy**
 - Environmental economists believe that by introducing appropriate adjustments to prices, and by otherwise tweaking economic incentives, we could solve many of our worse environmental issues **without having to resort to moral suasion**
 - Convincing people is difficult
 - Utilitarian ==> more people will be happy
 - Kant ==> won't act autonomously
 - Libertarian => no for regulation yes for not trespassing on others liberties
 - Deep ecologists + environmentalists => doesn't solve the problem
 - Breakthrough in Renewable Energy
 - What was the tipping point?
 - Renewable energy is competitive with fossil fuel
 - What was the point being made about manufacture economics versus resource economics?
 - Manufacture economics = more produce, the cheaper it is
 - Resource economics= price goes up the more you use
 - What is the general message of this documentary?
- Command-and-Control Techniques
 - The simplest incentives-based approach is one in which governments dictate the desired behaviour through laws and proceed to enforce them through traditional means (police, fines, prosecution, etc.)
 - In Environmental policy this usually translated into standards, which fall into three general categories:
 - Bans
 - Government dictates that a certain product/chemical/pollutant is no longer allowed
 - E.g. Ban of CPC
 - Montreal Protocol 1987
 - Slowly phased out, now completely disappeared
 - Ban of DDT
 - Large chemical companies were paying for ads to convince Americans that it's part of their economy/good for them
 - Rachel Carson led the fight against DDT
 - Predatory bird population (bald eagle!) increased after DDT ban
 - Ban of Asbestos
 - Used as an insulator for homes (+in astronaut and firefighter suits)
 - Environmentally destructive, caused cancer
 - Banned everywhere
 - Bad for QC econ → we had asbestos mines

- Ambient standards
 - Government impose acceptable level of a certain chemical or pollutant in the environment, and imposes limits on emitters to maintain this level==> not strict bans
 - E.g. Clean Water Act 1977
 - Amendment to the Federal Water Pollution CTRL Act of 1972
 - Sets the basic structure for regulating discharges of pollutants in the US
 - Gave EPA the authority to set water quality standards for industry and for surface contaminants in water
 - Technological standards
 - Dictates which particular equipment and practices must be employed, while bans and ambient standards set standards to respect and lets people/firms choose their means of achieving it
 - E.g. taxis powered by electricity (illegal to use fuel fleets)
- Advantages of Command and Control Techniques:
 - No **moral ambiguity**
 - If a certain practice is deemed unacceptable from a societal standpoint, it is directly legislated by the government and violation leads to penalty, period.
 - Incentives to **innovate**
 - In order to comply with bans or standards effectively, companies are encouraged to find cheap and effective ways, which may then be reproduced elsewhere in the economy
 - However, this is not true for **technology standards**
 - Very **simple**
 - No overly complex mechanisms to apply! You either respect the standard or you violate it.
 - The **incentive** is clear: respect the law and continue doing business as usual. Violate it and face the consequences
- Disadvantages of Command and Control:
 - No **incentive** to do **better** than the standard
 - Businesses that respect standard have no reason to continue diminishing their environmental impact, even if doing so would be relatively cheap for them
 - The **incentives to innovate** are perhaps inferior to other incentives-based techniques:
 - They are close to **zero** in the case of **technology standards**, and only truly significant in the case of **bans**, or truly stringent **ambient standards**, that force innovation
 - There can be cases where the **cost** of meeting standard is greater than the **value** of damages reduced
 - Not economically efficient
 - In other words, standards are not necessarily an economically efficient strategy to tackle environmental issues
 - It appears that **abatement costs** (costs of meeting standards) differ between firms and industry sectors
 - Standards affect sectors unfairly
- Emission tax
 - Impose a fixed rate tax on emission of a certain pollutant
 - E.g. 2\$/kg of NOx emitted in the atmosphere, 150\$/ton of nonylphenol released in waterways
 - This can be applied to any pollutant, but we most often hear of Carbon Taxes
 - A price is set on every ton of CO2 emitted in the atmosphere, thereby incentivizing companies to emit as little as possible
 - We mostly hear about carbon taxes
 - Incentive to emit as little as possible
 - Rationale:
 - Suppose you build a house. First you must buy a plot of land → Purchase building materials → Hire architect, carpenters, plumbers, etc. that require a salary
 - None of these products or services are free! In other words, to get all of this, we must pay
 - To get all this, we must pay with our own money, so we want to use resources sparingly and efficiently
 - We are used to this, because there are well established markets to purchase these things. We know they're not free!

- The consequence of this is that we tend to use these things sparingly and efficiently
- Waste disposal services of the environment are FREE. We don't pay for it, we don't feel incentivized to dispose waste efficiently
 - A company that produces building materials, clothing, fuel, electronic devices, etc, do not need to pay for the services provided by the environment
 - It is the equivalent of having one of their economic inputs provided to them completely free of charge!
 - Same as if they did not need to pay for their labour, for example!
 - Back to the house example, if building materials were free, you'd be incentivized to use as much of them as possible!
 - Therefore, companies have no economic incentive to use the waste-disposal services of the environment sparingly or efficiently!
- Therefore, the principle of the emission tax is not necessarily to penalize polluters, but rather to ascribe an economic value to the services of the environment
 - If you must pay to use the atmosphere as a sink for your pollution emissions, you will be encouraged to use the atmosphere sparingly and efficiently
- Objection:
 - It will hurt business, destroy jobs → Socialist conspiracy → businesses will close
 - If a busn cannot be profitable without being environmentally destructive, does it deserve to exist?
 - This tax does not need to be high!
 - It only needs to be high enough to provide an economic advantage to low polluting firms over highly polluting ones!
 - The revenue created by this tax could be transferred as tax cuts to business, so that overall tax base remains equal, while adjusting incentives towards cleaner processes
- Real world example: courier industry (FedEx vs UPS)
 - How do they compete? They maintain similar prices, so how do they make profit
 - By lowering costs (lower salaries to employees, streamlining services and optimizing routes, minimizing costs of trucks, planes, trains, upkeep)
 - No incentive to use electric trucks or otherwise limit their emissions
 - Enter a carbon tax: 15\$/ton of CO₂ emitted
 - This tax permits all companies to continue their business, with slightly reduced profits
 - How does this impact competition in the courier industry?
 - All other things being equal, the courier company that transitions to low-emissions transports, or otherwise cuts emissions becomes comparatively advantaged!
- Emission taxes vs Command-and-Control
 - Difference in principle
 - With a standard, the firm must comply, but is still in essence getting the environmental service for free
 - Difference in economic efficiency:
 - Tax applies evenly and fairly to all firms
 - It really just favours low polluting business over polluting ones within the same industry
 - Emission tax also incentivizes companies to reduce emissions as much as possible
 - They will always benefit from an additional reduction
 - There is a difference in incentive to innovate
 - The tax does not tell firms which technology to use: it merely encourages them to find ways to emit less any way they can!
 - leave it up to companies to decide how they want to reduce emissions to increase profits
 - Every firm will be incentivized to invest heavily in R&D (research and development)
- Problems:
 - Can be difficult to monitor:
 - Any gov programs which relies on constantly calculating the emissions of colorless, odourless gases from all major firms invites cheating...
 - Difficult to monitor emissions (e.g. cheating, CO₂ is odorless and colorless)
 - The world "tax" is generally a hard sell

- People often associate taxes to government encroachment
- The word tax is hard to sell bc it's associated to govt encroachment (there will be lots of lobbying)
- There is the moral ambiguity of paying to pollute, which poses ethical issues that some find distasteful
- Carbon leakage ==> Companies moving to countries with low pollution regulations
- Others propose a subsidy-based approach to emissions
 - Essentially the same but backwards (remember that example with the green detergent)
 - Make it cheaper
 - This is of course challenged for essentially the same reasons as the emission tax
- In some cases, it is possible to combine tax and subsidy approaches:
 - Think of deposit-refund systems:
- Emission Trading (Cap-and-Trade)
 - Emissions trading, otherwise known as transferable discharge permits, or cap-and-trade system
 - Emissions taxes imply a central authority that establishes a tax rate, monitors each polluter, and collects tax bills
 - Likely to cause resentment, adversarial relationship
 - Emissions trading attempts to reach same objectives but in more decentralized, market-based approach
 - Like emissions tax, we hear of this approach most often in discussions about carbon emissions
 - However, cap-and-trade has been used to fight NOx emissions which causes acid rains, and shown results
 - Cap on all emissions ==> reduce emissions or pay other companies to reduce for them
 - Reduce their own emissions
 - Pay other company to reduce their own emission in their name
- Steps
 - Step 1: Government establishes overall cap on desired pollutant (say, CO₂) for entire country
 - Put a cap on the total carbon the economy can produce
 - As dictated by international agreement, perhaps.
 - Step 2: Division of overall cap in transferable discharge permits (in units of 1 metric ton, for example)
 - Use it or sell
 - Step 3: Distribution of said TDPs to all major pollutants
 - Usually excludes very small firms
 - Based on historical trends, or other metrics set by specialists
 - Could be distributed evenly
 - Most problematic element
 - Assuming that overall cap is inferior to current level of emissions, some polluters receive less permits than current emission levels
 - Step 4: Establishment of market to trade TDPs by firms
 - Stock exchange
 - Price that fluctuates
 - Step 5: Gov. controls price of TDPs by adjusting cap
 - By adding or (ideally) removing TDPs from the market
 - So capacity of firms to pollute would go down
- Often, emissions trading is justified based on the idea of tackling the “low-hanging fruit”
 - Low hanging fruit: Tackling the easy problems first
 - Companies for which reducing emissions is easy and cheap will reduce them first, and be paid to do so through market
 - Companies for which reducing is very expensive will buy permits from other companies
 - When overall cap is lowered, we then collectively tackle emissions which are slightly harder to abate, and so on
 - In other words, we can see this as society as a whole subsidizing companies that can easily abate their emissions to do so first, and leave the harder reduction for later!

- Perhaps when better, cheaper, greener technologies emerge!
- Sometimes, cap-and-trade schemes can include offset programs as well
 - Won't reduce emission but pay somewhere else that can plant tree that would balance the extra emissions
 - Instead of purchasing TDPs to account for their excess carbon emissions, firms may be allowed to pay for tree-planting and/or the protection of existing forests elsewhere in the world (carbon trapping) ==> protect forests cuz they trap carbon
 - Both systems can theoretically coexist in the same carbon market: simply provides more options to respect cap
- Key advantages of emission trading:
 - Like with standards, emissions trading ensures that maximum target level of pollution is achieved
 - Not necessarily the case with emissions taxes
 - Uses market forces (Smith's invisible hand) in order to achieve the most cost effective emissions reduction
 - This is not achieved by standards, and to a somewhat lesser extent with emissions taxes
 - Provided firms with freedom to choose abatement strategy
 - Provide powerful incentives for innovation
 - If you can find ways to reduce your carbon, you can sell the bonds and make money
 - Firms stand to not only reduce their tax bills by emitting less, but also to make profits by selling TDPs to other companies, if they can come up with innovative green technologies
- Some problems related to emissions trading:
 - Like with any other environmental policy, there is a risk of carbon leakage: companies moving to avoid all regulation
 - Some industry more susceptible to this than others
 - Risk reduces as more jurisdictions join market
 - The initial allocation of emission permits will inevitably cause friction, competition, frustration, inequality
 - Distribute evenly? According to present emissions? Historically?
 - Can only polluters buy permits? Or green groups as well?
 - There is the problem of hot-spots: polluting is not always as destructive, it can depend on the location of the discharge
 - Market only function smoothly when they are very large ==> carbon leakage problems
 - That is why a Quebec-only market is not enough to work
 - Like with the emission tax, emissions are hard to monitor
 - How do you introduce new firms into a market like this?
 - Companies need to be big enough to need permits
- The Quebec cap-and-trade system and the WCI
 - What were your impressions, while reading this?
 - What steps did the Quebec government take to limit the possible negative impacts of emission trading on business?
 - Give additional subsidies to go green
 - Gov employed specialist to help companies reduce their emissions
 - Problems?
- Critiques of Environmental Economics Approach
 - 1. The historical evidence so far suggests that economic growth is **coupled** with carbon emissions
 - Economic growth coupled with emissions
 - More econ growth=more environment degradation
 - So far, no real evidence to suggest that economic growth can happen without further environmental degradation
 - Therefore, measures that do not challenge economic growth fall short of what is needed!
 - 2. Environmental Economics largely rest on the idea of "pricing" the services of the environment, but what about things that have strictly no value to human?
 - We are unable to judge the real price of the environment

- This joins Leopold's argument: how can humans be the sole judges of what has worth and what doesn't?
- 3. Market failures got us into this mess in the first place, is it reasonable to assume that it can now get us out of it?
 - Problem with market crashes and carbon bonds can become worthless
 - What if unforeseen market failures appear once we have established markets for environmental goods?
- 4. The ethical problem
 - Kant: "That which is related to general human inclinations and needs has a market price. But that which constitutes the condition under which alone something can be an end in itself does not have mere relative worth (price) but an intrinsic worth (dignity)"
 - Things that allow us to have a stable economy have intrinsic worth
 - Viewing nature in terms of individual consumer preferences rather than convictions, duties, aesthetic judgements, etc. is for most people a kind of "category mistake"
 - Things have intrinsic value not relative value
 - Pricing the environment is adhering to the false pretence that everything has price and worse than money is the highest of all values
- 5. The higher immorality of late-stage capitalism
 - Capitalism is itself the problem
 - In 1992: the U.S spent over 1 trillion dollars in marketing, and about 400 million on education
 - Under the circumstances, what can we expect people's priorities to be?