

International environmental vs. regional/national environmental issues

Some welfare economic repetition

The indirect utility function $V(\mathbf{p}^k, Y - T^k, Z^k)$: A powerful and handy tool to capture the welfare effects of policy, where k indicates a policy scenario, usually $k = \{0, 1\}$ where 0 is without and 1 with the policy. With only two policy alternatives, a convenient way to rewrite the indirect utility function is $V(\mathbf{p}^k, Y - \Delta T, \Delta Z)$ where usually we assume $\Delta T > 0$ if $\Delta Z > 0$ (otherwise, the analysis is trivial as we get ΔZ for free). Note that $Y - \Delta T$ corresponds to disposable income (for consumption).

The price vector \mathbf{p}^k may be policy dependent (and always need to be policy specific under general equilibrium, Y is income, T^k is direct policy costs (taxes or other policy related outlays), and Z^k is the policy relevant level of the public good (my advice: frame this with a positive impact on welfare, as this makes it easier to analyze the tradeoffs).

Partial derivatives with signs

$$\frac{\partial V(\dots)}{\partial p_i^k} \leq 0 \quad \text{where } i \text{ indexes price on commodity } i$$

$$\frac{\partial V(\dots)}{\partial (Y - T^k)} > 0 \quad \text{where } (Y - T^k) \text{ is disposable income for policy } k$$

$$\frac{\partial V(\dots)}{\partial Z^k} > 0 \quad \text{by definition and for convenience in the analysis.}$$

Global/international problems

All countries have a potential gain from the problem being corrected compared to status quo $\Delta Z_{all} > 0$, but any would be better off if all the other countries took on the costs, and oneself did nothing. This gives:

1. For the countries who takes on costs of fixing the global problem: $V(\mathbf{p}, Y - \Delta T, \Delta Z_{all})$
2. For the country that free rides on the others “doing the job”: $V(\mathbf{p}, Y, \Delta Z_{all})$

The difference between (1) and (2) is the absence of ΔT in (2) \rightarrow a Nash-like payoff structure likely \rightarrow game settings. In international games there is no principal (countries are reluctant to give up on their sovereignty). Two types of games: (i) Dynamic like the Folk theorem. (ii) Games with side payments.

Policy response from the countries that have implemented appropriate environmental policies: Levy an import tax on the countries not having done so. Import levies that compensate domestic industries for the cost advantage gained by exporting countries from no or insufficient environmental policies are within WTO rules.

Global/international problems compared to national/regional problems

National/regional problem = only those “within the border” (subscript 1) are affected a negative externality $\rightarrow \Delta Z_1 < 0$, while those outside (subscript 0) have $\Delta Z_0 = 0$ but a possible price decline from cheaper imports, $\Delta \mathbf{p}_{imp} \leq 0$.

- within $V(\mathbf{p}, Y - \Delta T, \Delta Z_1)$
- outside $V(\mathbf{p} + \Delta \mathbf{p}_{imp}, Y, \Delta Z_0)$

An interesting case on how bad things may get: Export lobby groups within a country could argue that a lost export revenues could result if the true costs of internalizing domestic damages were to be included (“within” equation above). Compare with welfare of no domestic policy: $V(\mathbf{p}, Y, 0)$.

Optimal policy decided by what is the largest: $V(\mathbf{p}, Y - \Delta T, \Delta Z_1)$ or $V(\mathbf{p}, Y, 0)$.

In many cases these kinds of “hidden export subsidies” lower the welfare in exporting countries, and provide a “subsidy” of consumers in other countries, who get some imported goods for lower prices $\Delta \mathbf{p}_{imp} \leq 0$, i.e., they benefit. Using the indirect utility function we get:

$V(\mathbf{p} + \Delta \mathbf{p}_{imp}, Y, \Delta Z_0) > V(\mathbf{p}, Y, \Delta Z_0)$ where environmental quality is unaffected of the imports.