Direitos de Propriedade

Kolstad

Capítulo 13

Instituições e o funcionamento de mercados

- Instituições desempenham um papel fundamental para que mercados consigam realizar a alocação de recursos.

- Uma simples mudança institucional estabelecendo direitos de propriedade ativa os mecanismos de preços e de mercado.

- Direitos de propriedade completos (bem definidos, transferíveis, seguros) é condição para competição perfeita

Quem deve receber os direitos?

- Princípio do poluidor pagador

- Mas: será que o poluído não deveria pagar por estar exposto à poluição?

- E mais: quem recebe os direitos importa para eficiência alocativa?

O Problema do custo social

- R. Coase estudou a implicações da alocação de direitos de propriedade em seu famoso artigo ‘The Problem of Social Cost’, *Journal of Law and Economics*, 1960.

ECONOMIA DO MEIO AMBIENTE

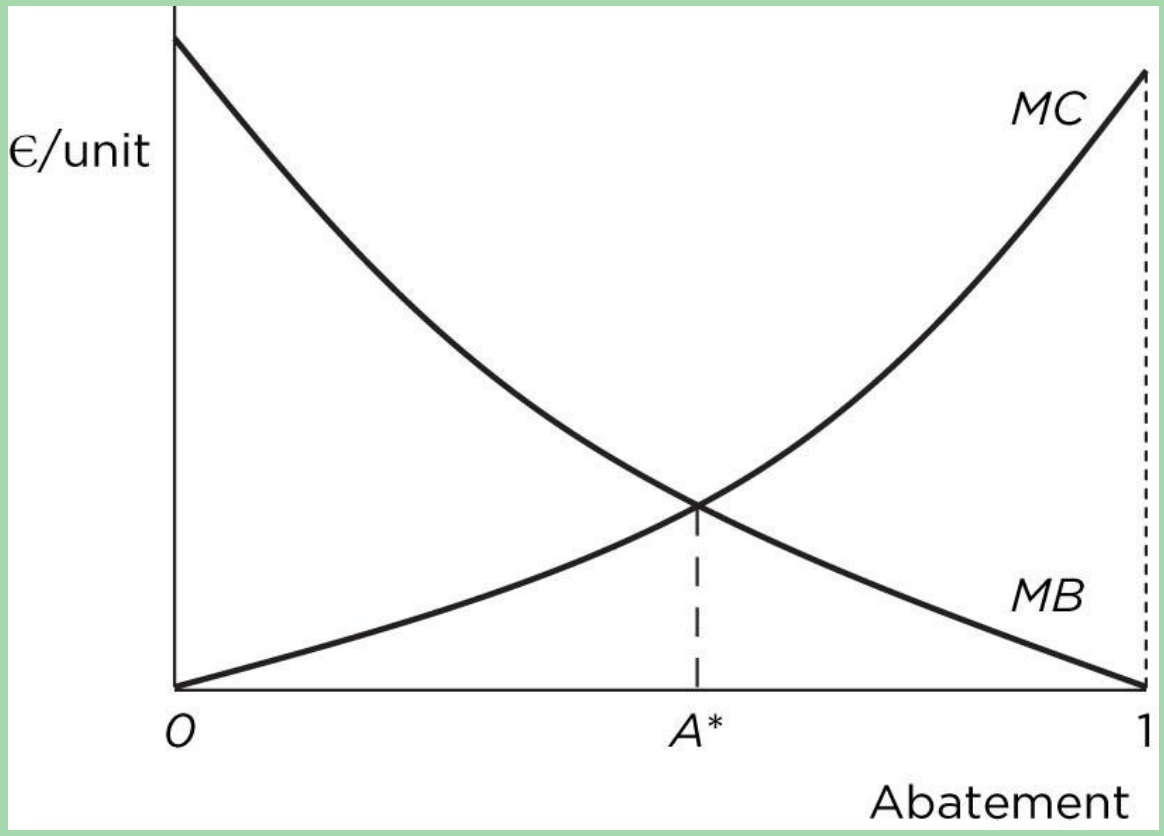


FIGURE 13.1 An illustration of the marginal conditions for an efficient level of abatement, trading off the marginal cost of abatement for the refinery (*MC*) with the marginal benefit to the car factory (*MB*).

Exemplo

- Assuma que a comunidade pesqueira tenha direitos de propriedade sobre a qualidade da água do rio.
- A refinaria teria então que pagar uma compensação para a comunidade para poder poluir o rio.
- Se o preço pago é igual ao custo marginal da poluição para o pesqueiro, as externalidades também são internalizadas.

Formalmente

independente do nível de produção da refinaria, o pesqueiro produz

$$\longrightarrow \quad p_f = \frac{\partial C_f(F, A)}{\partial F}$$

podemos então pensar que

$$\begin{cases} F^* = F(A) \\ F(0) > F(A) \end{cases}$$

compensação

$$CO = \pi_f\left[F(0), 0\right] - \pi_f\left[F(A), A\right]$$

Lucros da Refinaria

lucro da refinaria

$$\pi_a = p_a A - C_a(A) - CO$$

condições de 1a ordem

$$\frac{\partial \pi_a}{\partial A} = p_a - \frac{\partial C_a(A)}{\partial A} + \frac{\partial \pi_f\left[F(A), A\right]}{\partial A} = 0$$

precisamos então estudar

$$\frac{\partial \pi_f\left[F(A), A\right]}{\partial A}$$

Lucros do Pesqueiro

$$\pi_f = p_f F(A) - C_f\left[F(A), A\right]$$

$$\frac{\partial \pi_f\left[F(A), A\right]}{\partial A} = p_f \frac{\partial F(A)}{\partial A} - \frac{\partial C_f\left[F(A), A\right]}{\partial F(A)} x \frac{\partial F(A)}{\partial A} - \frac{\partial C_f\left[F(A), A\right]}{\partial A}$$

$$\frac{\partial \pi_f\left[F(A), A\right]}{\partial A} = \left\{ p_f - \frac{\partial C_f\left[F(A), A\right]}{\partial F(A)} \right\} \frac{\partial F(A)}{\partial A} - \frac{\partial C_f\left[F(A), A\right]}{\partial A}$$

Lucros do Pesqueiro

$$\pi_f = p_f F(A) - C_f[F(A), A]$$

$$\frac{\partial \pi_f[F(A),A]}{\partial A} = p_f \frac{\partial L(A)}{\partial A} - \frac{\partial C_f[F(A),A]}{\partial F(A)} x \frac{\partial F(A)}{\partial A} - \frac{\partial C_f[F(A),A]}{\partial A}$$

$$\frac{\partial \pi_f[F(A),A]}{\partial A} = \underbrace{\left\{ p_f - \frac{\partial C_f[F(A),A]}{\partial F(A)} \right\}}_{=0} \frac{\partial F(A)}{\partial A} - \frac{\partial C_f[F(A),A]}{\partial A}$$

Equilíbrio Eficiente

$$\frac{\partial \pi_f [F(A), A]}{\partial A} = -\frac{\partial C_f [F(A), A]}{\partial A}$$

equilíbrio eficiente

$$p_a = \frac{\partial C_a(A)}{\partial A} + \frac{\partial C_f [F(A), A]}{\partial A}$$

Teorema de Coase

- Poluição ótima (eficiente) independente de quem detém o direito de propriedade.
- Condições:
  - Custo de transação zero.
  - Não há efeito riqueza.
  - Informação perfeita.
  - Tomadores de preço.

Teorema de Coase

- Na prática custos de transação existem.

- Contribuições do Teorema de Coase:
  - Aloque direitos de propriedade de forma a minimizar custos de transação (Ex. Acid Rain Program, EUA).
  - Considere a possibilidade de vítima pagar.

- Teorema de Coase: Eficiência versus Equidade. Direitos de propriedade como ativo de valor.

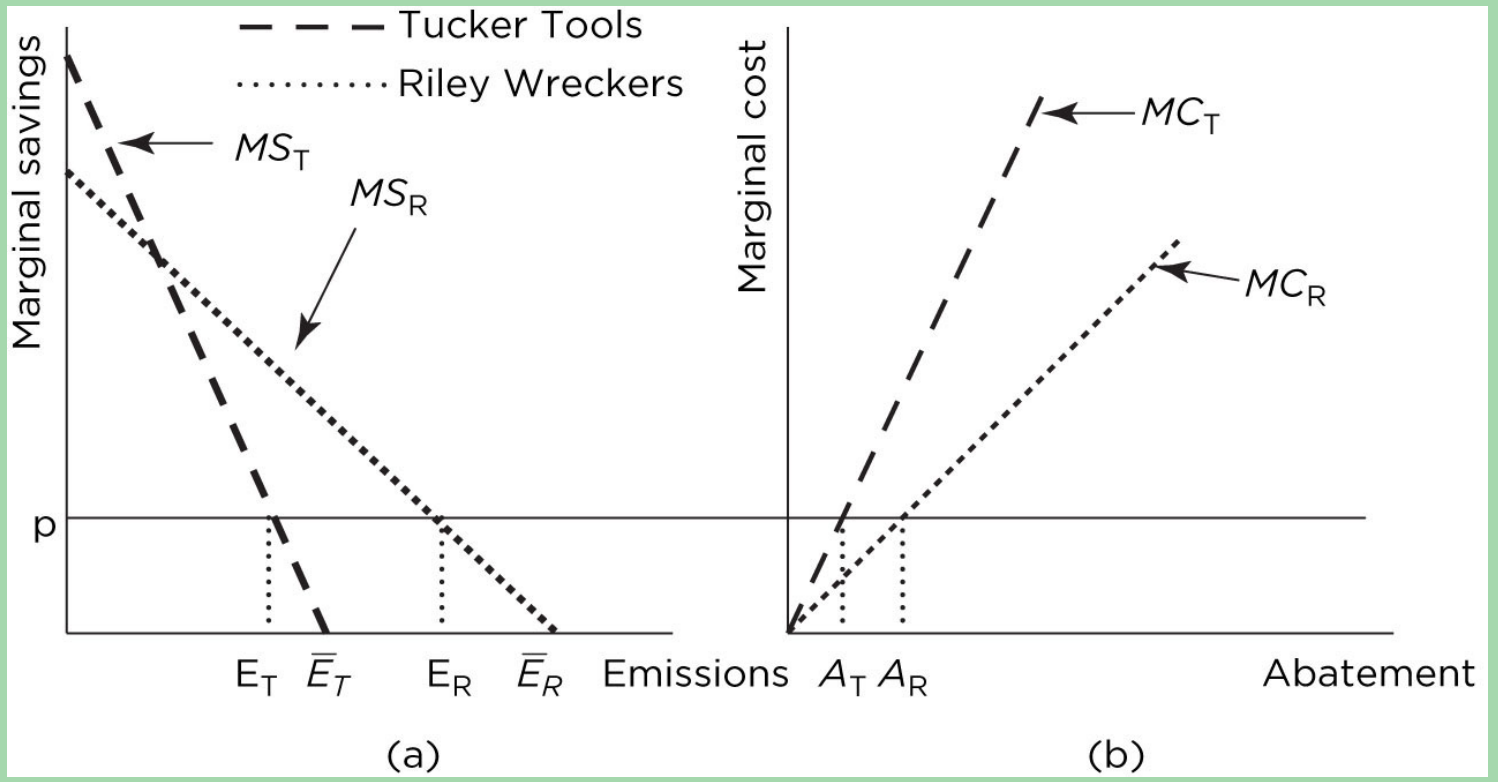
Títulos negociávies de poluição ("cap and trade").

- Ideia: criar cotas de poluição e permitir os agentes negociarem os títulos
- Exemplos:
  - Acid Rain Program (usinas de energia/SO_2).
  - Regional Clean Air Incentives Market (Califórnia).
  - Sistema de transação de emissões da União Européia (EU ETS – emissions trading system) para gases do efeito estufa.
  - Mercado de carbono

Marketable Permits: basics

- Each firm is allowed to emit a certain amount of pollution
- Firms are allowed to trade their permits
- A firm that cuts its level of pollution can sell permits to another one wanting to expand production
- In equilibrium, marginal cost of pollution reduction must be equal to the market price of the permit

Taxa de Poluição e Incentivo do Poluidor – Vários Poluidores



ECONOMIA DO MEIO AMBIENTE

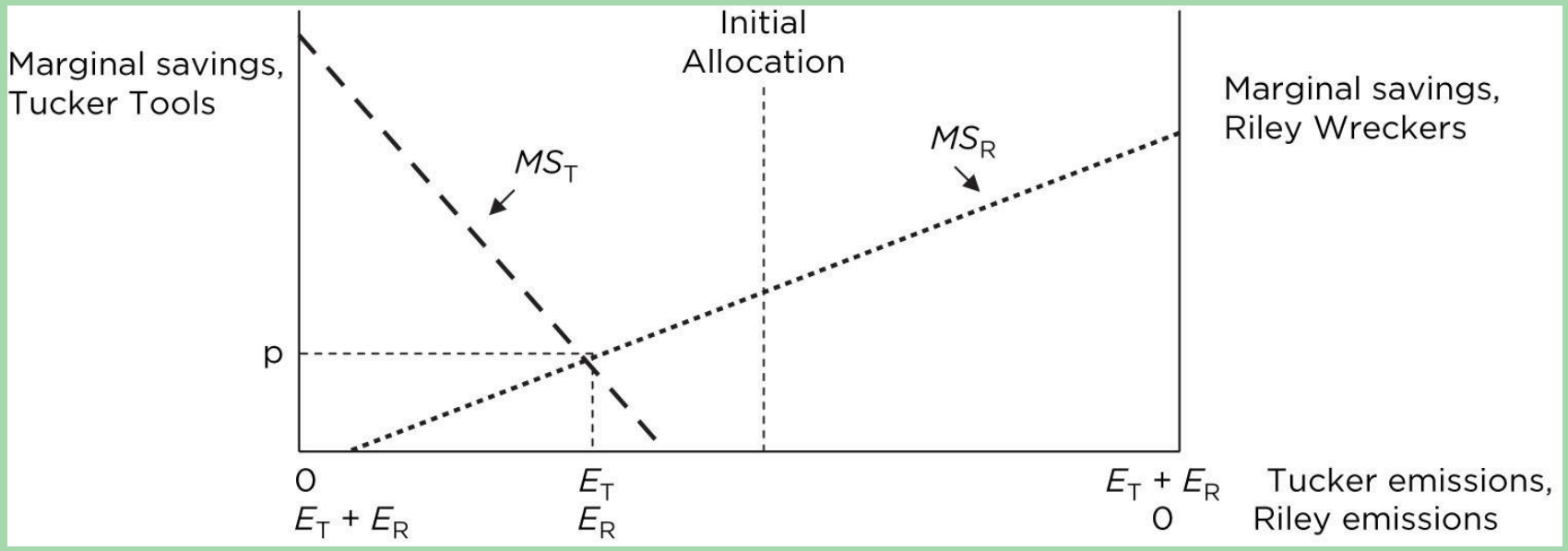


FIGURE 13.2 Illustration of trading of permits between two firms.

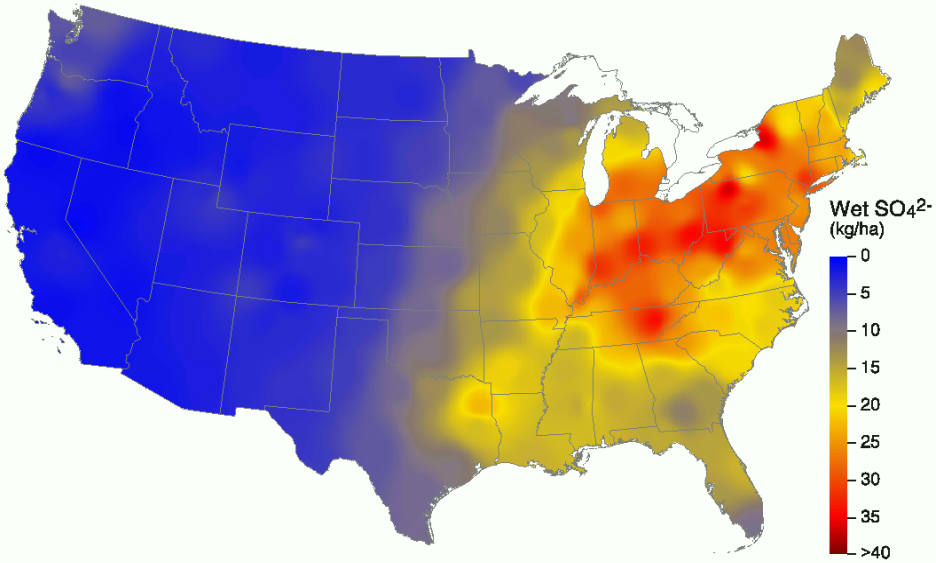
Marketable Permits: pros and cons

- If the government knows the total amount of pollution to be reduced then MP is a mkt mechanism to adjust the price **without info requirements** on individual players and not bearing the risk of excessive pollution (such as in the case of fines).

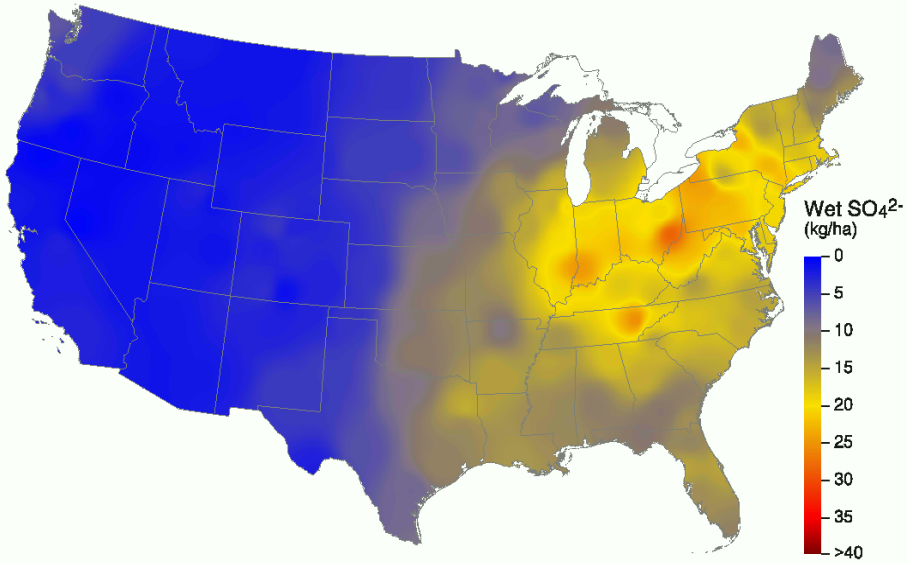
- Problems:
  Assignment of initial permits
  market thiness
  transaction costs
  dominant firms
  Spatial distribution of pollution

Monitoramento da Chuva Ácida

1989 - 1991



1998-2000



Redução significativa da chuva ácida (Acid Rain Program).

Fonte: National Acid Deposition Program.

Tradable Development Rights

Introduction

- The trade-off conservation-development is a land use issue.
- For biodiversity conservation in the tropics to be desirable and sustainable, the forgone development opportunities must be fully compensated
- Is TDRs a possible mechanism?

Conserving Habitats

- Biodiversity has 3 levels: genetic diversity, species diversity and ecosystem diversity
- Conservation of biodiversity in many tropical areas is largely a matter of conserving entire habitats rather than individual species
- arguments: returns to scale to conservation, public good, uncertainty with respect to commercial values of species (quasi-option value), complexity and interactions between species, fragility and irreversibility of ecosystems, non-biodiversity benefits from habitat preservation

Biodiversity Conservation as a Form of Land Use

- Biodiversity conservation is a matter of identifying and protecting critical habitats and therefore the issue collapses into one of land use

- Setting aside land as protected habitat has an opportunity cost in terms of forgone benefits from alternative land uses

- Assuming that land owners maximise profits (or rents), privately held land would be set aside as biodiversity habitat only if this is the best possible land use in the sense that it maximises net present value of land rents

Biodiversity Conservation as a Form of Land Use

- This is unlikely since most of the benefits from biodiversity conservation and habitat protection are public rather than private

- Without government intervention through regulations, economic incentives, or outright purchase of private land, and without sufficiently funded NGOs, very little private land is actually set aside as conservation land.

Biodiversity Conservation as a Development Policy Issue

- In developing countries, with limited accumulation of physical and human capital, land is a very important economic asset
- Land use issues are therefore development issues
- Land and its associate resources are not only important sources of employment and income but they are also one of the main sources of investible surplus for industrialisation
- Again, biodiversity conservation is likely to be perceived by both land owners and host governments as forgone development opportunities

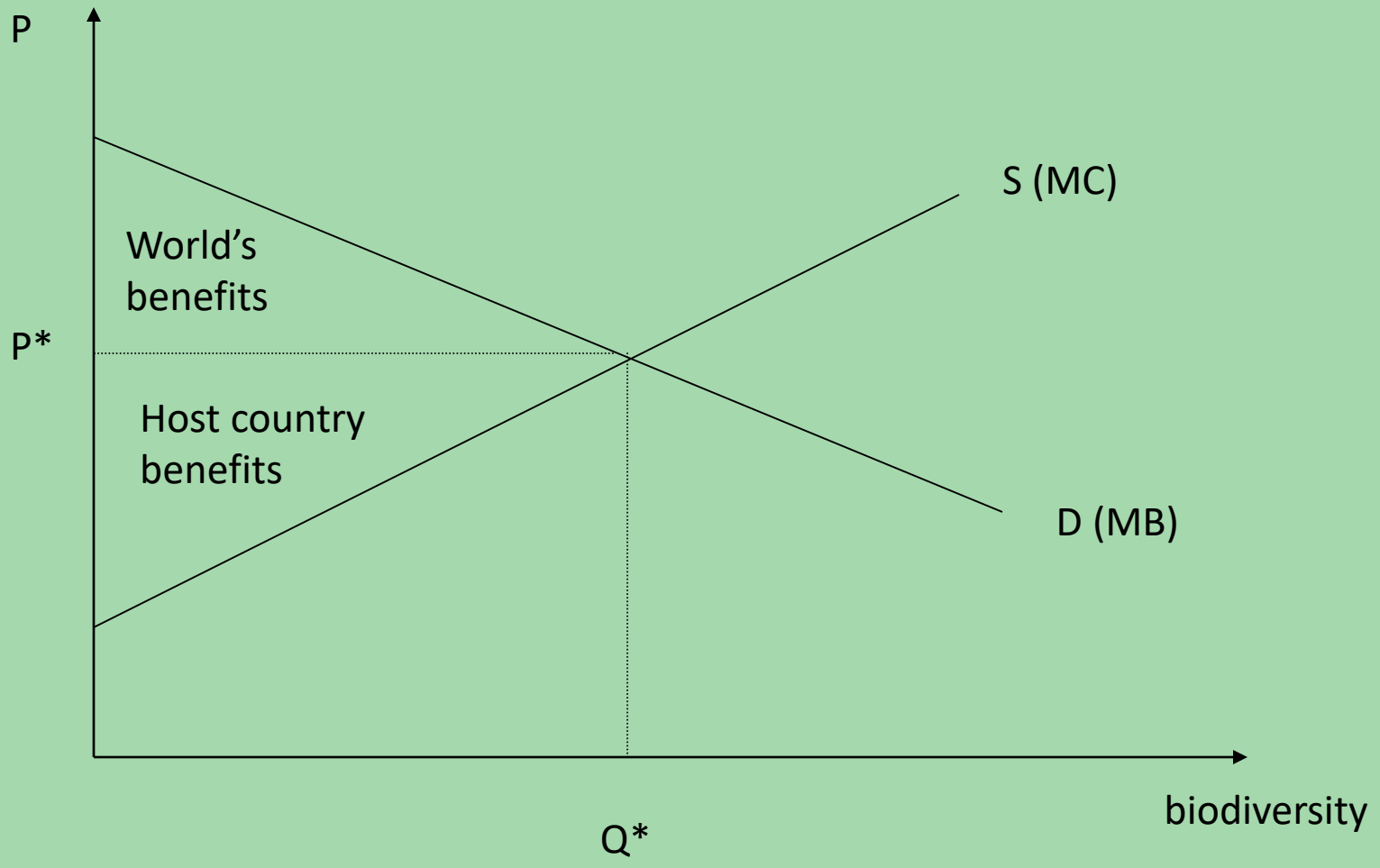
Demand and Supply for Biodiversity

- Theoretically there is a demand and supply of biodiversity conservation and an equilibrium price that clears the market

- The demand reflects the world's full valuation of biological diversity as reflected in their willingness to pay, which is itself a function of income level, education, environmental awareness, and other socio-economic characteristics.

- The supply reflects the forgone marginal benefits of the development opportunity sacrificed in order to supply and additional unit of biodiversity by expanding the country's conservation area.
- Opportunity costs are in turn a function of the country's level of development and the availability of alternative opportunities

Demand and Supply for Biodiversity



The Concept of TDR

- Important conflicts arise from the failure to distinguish between ownership and spatial exercise of development rights.

- The treatment of biodiversity as global rather than national resource are perceived by developing countries as a challenge to their ownership and sovereignty over these resources

The Concept of TDR

- If the aim is to conserve biodiversity, the world should recognise national rights to develop their land as to maximise profits but try to negotiate the location of these development rights.

- The idea is to voluntarily transfer the development rights over critical habitats elsewhere in the country or abroad

Command and Control

- The ‘standard’ solution is comand-and-control based land planning where land is designated as conservation areas.
- This is a ‘radical’ attenuation of development rights which results in a substantial reduction in the stream of benefits expected from the land and hence a reduction in the market value of the land.
- This gives rise to claims for compensation which is highly costly when large areas are involved

Market Based Incentives

- The concept of TDRs makes possible the creation of conservation areas without the need for assessment of land values and compensation: it simply creates a market with demand and supply of development rights.

- This market is expected to generate equilibrium prices at which exchange or transfer takes place.

The Concept of TDR 2

- The concept of TDRs works as follows: the owner of a preserved land/building does not lose his/her rights to develop his property; he/she simply can not exercise them *in situ*; he/she can exercise them elsewhere.

Potential Benefits of TDRs

- Critical natural habitats are likely to be protected
- Land owners are fully compensated
- Government would solve the C-D trade-off without payment of compensations and without opposition of local land owners or environmental groups
- Costs of conservation and environmental improvement are efficiently and equitably distributed among the beneficiaries

Implementing International TDRs

- Tropical countries could set aside habitats for biodiversity conservation and divide each habitat into a number of TDRs, corresponding to an area unit.

- Each TDR states the location, condition, diversity, and degree of protection of the habitat and any special rights that it conveys to the buyer/holder

Implementing International TDRs

- TDRs could then be offered for sale both locally and internationally at an initial offer price that covers fully the opportunity cost of the corresponding land unit

- Then demand and supply for different kinds of TDRs would adjust prices through time eventually converging to an equilibrium situation

Funds for Conservation Areas

- Revenues obtained from the sale of TDRs (in public land or through taxes) could then be used to ensure that conservation areas are protected

- This could be done through direct intervention or by transferring funds to individuals or communities who live in forested areas to make it in their best interests to protect those areas (compensation)

- Revenues could be used to employ management services to ensure and certify effective protection

Potential Buyers

- International environmental organisations
- Local and international foundations and corporations
- Developed country governments
- Chemical and pharmaceutical companies
- Scientific societies
- Universities and research institutions
- Environmentally minded individuals

Regional Markets for TDRs

- An area where the program will take place is defined.
- Property owners must keep a fixed proportion of their land as natural unconverted forests.
- Property owners might be assigned development rights (or forest allowances) equivalent to the number of hectares of forest they own beyond the legal reserve and permanent protection requirements

Regional Markets for TDRs

- Properties with allowances would be permitted to sell them to properties that are out of compliance with the legal reserve requirement or that want to develop and additional area beyond their own development rights

Zoning of TDRs

- Single Zone System: after an initial allocation of TDRs anyone within the program area may buy or sell the permits
- Dual Zone System: there are designated sending areas and receiving areas (like Panayotou's proposal)
- For habitat conservation the choice of TDR model depends on a precise formulation of conservation goals

Zoning of TDRs

- Dual zone systems are most appropriate when the goal is to preserve certain plots with unique characteristics, or to maintain large blocs of contiguous habitats

- Single zone systems are most appropriate when plots are similar, and where population viability is not critically sensitive to the size of plots, so that the goal is to maintain a specified amount of the habitat, regardless of its configuration

Allocation of TDRs

- The relatively small scale of existing rural TDR schemes suggests that there are political and institutional barriers to implementing these systems.

- In any tradable permit scheme, initial allocation of permits has large distributional consequences. Achieving public consensus on these schemes is therefore a lengthy and difficult process

Transactions, Monitoring and Enforcement Costs

- TDR programmes suffer from high transaction costs because transferring TDR requires considerable administrative and legal efforts.
- Where markets are thin, the sales transaction itself may be difficult and time-consuming.
- Perhaps even more importantly, there are significant monitoring and enforcement costs.

Transactions, Monitoring and Enforcement Costs

- For the programme to be effective it is necessary that all property owners are in compliance, and that all TDRs are genuine and used without duplication. This requires a system for property inspection, a TDR registry, and an effective set of legal sanctions

Market Area Size

- Assuming heterogeneous habitats
- Larger markets are better for enhancing economic efficiency (larger number of transactions)
- However, larger markets will generate lower environmental benefits (higher costs) as different ecosystems will be included in the trading areas.
- Optimal market size?

Readings

- T. Panayotou (1994) 'Conservation of Biodiversity and Economic Development: The Concept of Transferable Development Rights', Environmental and Resource Economics, v 4: 91-110

- Chomitz, K. (1999) 'Transferable Development Rights and Forest Protection: A Exploratory Analysis', Workshop on Market-Based Instruments for Environmental Protection, John F KennedySchool of Government, Harvard University

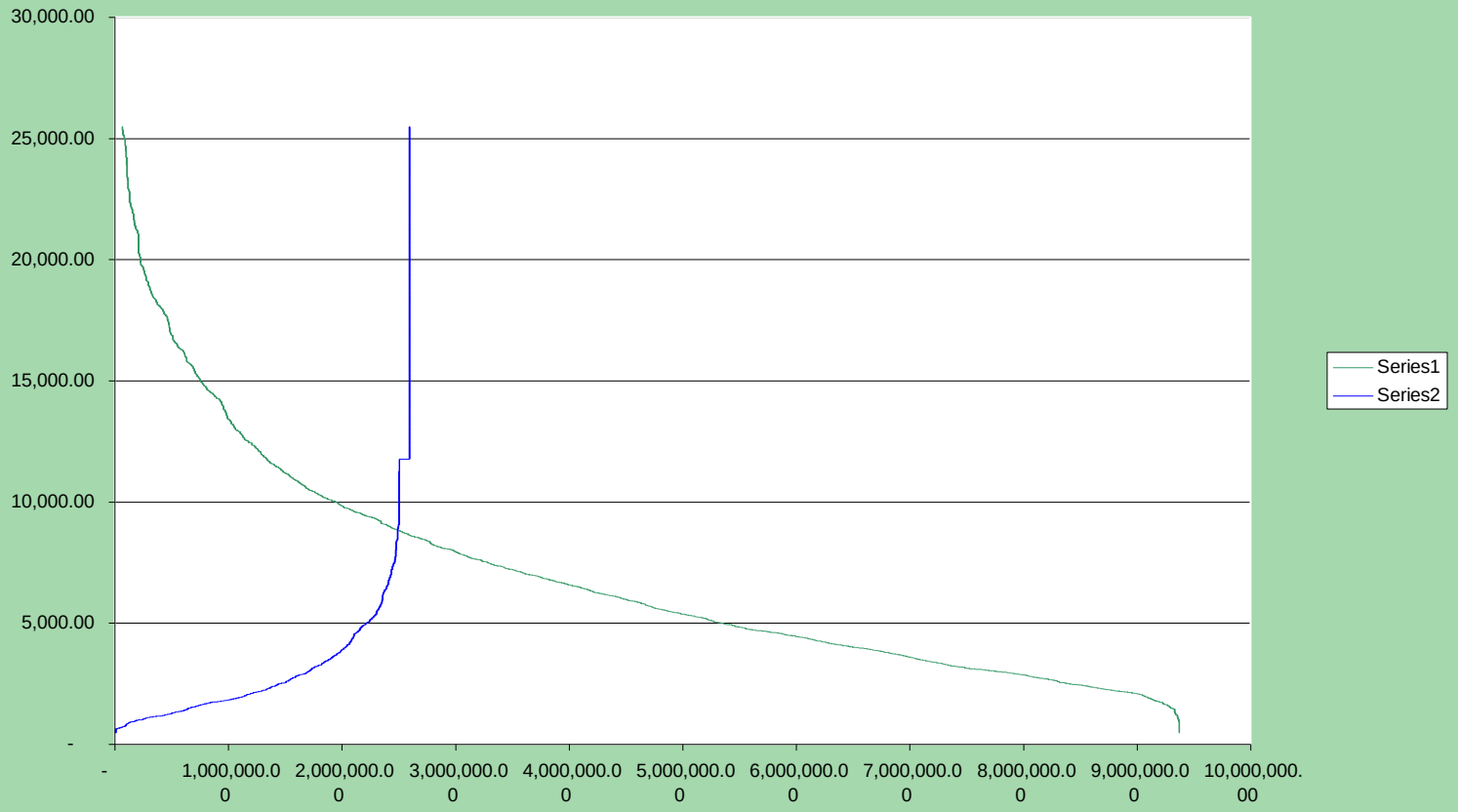
- Chomitz, K., T. Thomas, and A.S. Brandrao (2004) 'Creating Markets for Habitat Conservation When Habitats are Heterogeneous', World Bank Policy Research Working Paper 3429

The Goias Project

- This project aims to apply spatial economic models to available data in order to investigate the outcomes of alternative scenarios for protecting native vegetation in the state of Goiás.

- Our results provide evidence that, in principle, the creation of markets for reserves of native vegetation has the potential to contribute with initiatives aiming to balance the conservation-development trade-off in the state of Goiás.

Supply and Demand



ECONOMIA DO MEIO AMBIENTE

Supply
(oferta)
X
Demand
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