# The Triple Dividend

## Climate Change Mitigation, Justice and Investing in Capabilities

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# Outline

1. Rent Taxation and Reduction of Poverty

2. Rent Taxation and Intergenerational Justice

3. Rent Taxation and Investment in Capabilities

4. The Climate Rent – Reaping a Triple Dividend

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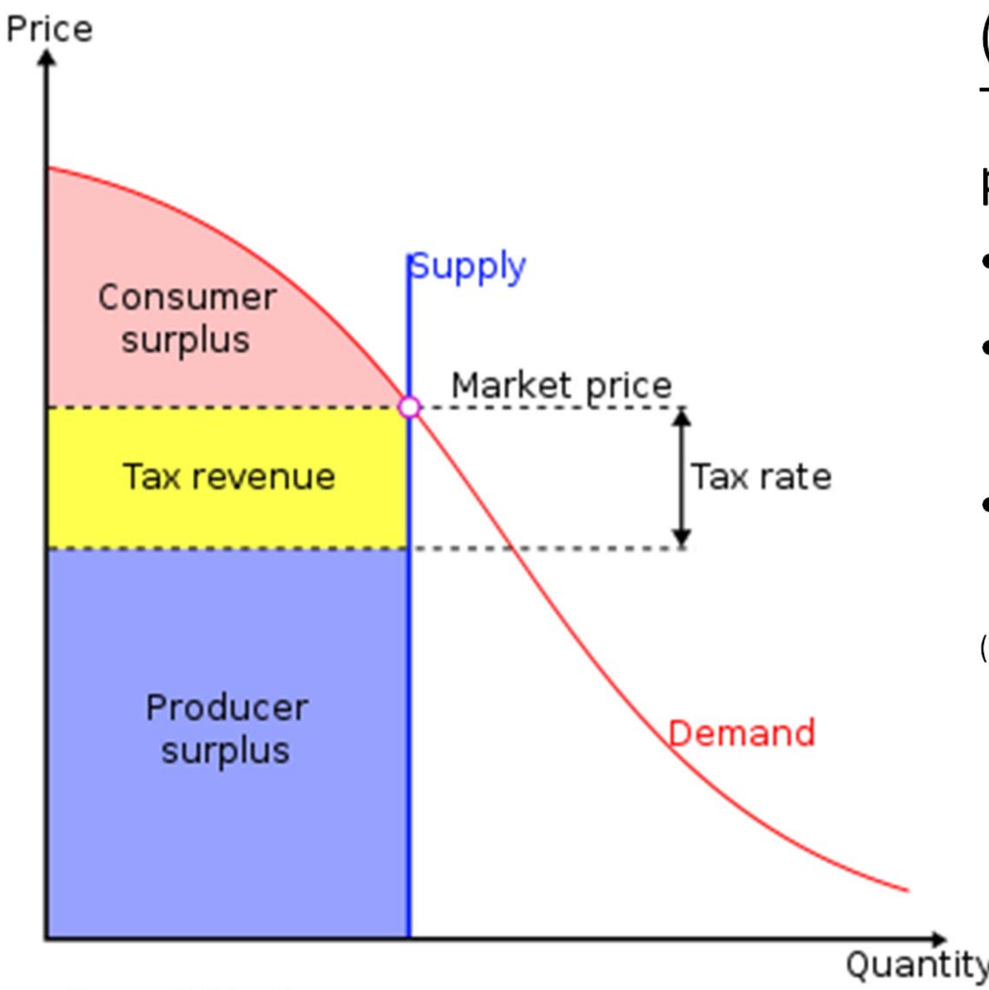
# How to overcome the trade-off between Justice and Efficiency?




Source: Wikipedia

(Naïve) Efficiency argument: Taxing a totally inelastic production factor…

- produces no net welfare loss,
- does not distort the resource allocation,
- resource owners bear the full cost of the tax.

(Quesnay (?), Ricardo, George, Friedman)

# Common-Pool Resources

“All **common-pool resources** share two attributes of importance for economic activities:

(1)[*Non-Excludability*] It is costly to exclude individuals from using the goods either through physical barriers or legal instruments and

(2)[*Rivalry*] The benefits consumed by one individual substract from the benefits available to others.”

| | easy to exclude | hard to exclude |
|---|---|---|
| high rivalry | Private Goods | **Common-Pool Resources** |
| low rivalry | Club Goods | Public Goods |

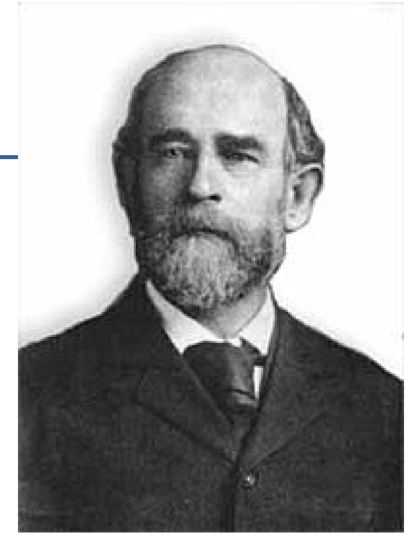
# Common-Pool Resources and Property Right Regimes

**Property right**

| | |
|---|---|
| *Right of access* | "The right to enter a defined physical area and enjoy nonsubstractive benefits (for example hike, canoe, sit in the sun)." |
| *Right of withdrawal* | "The right to obtain resource units or products of a resource system (for example catch fish, divert water)." |
| *Right of management* | "The right to regulate internal use patterns and transform the resource by making improvements." |
| *Right of exclusion* | "The right to determine who will have access rights and withdrawal rights, and how those rights may be transferred." |
| *Right of alienation* | "The right to sell or lease management and exclusion rights" |

**Ostrom 2000a, p.338**

## The “just” Tax: Henry George (1837 – 1897)



**“Progress and Poverty” (1879/1912):**

*“ Poverty deepens as wealth increases, and wages are forced down while productive power grows, because land, which is the source of all wealth and the field of all labor, is monopolized. [...] This, then, is the remedy for the unjust and unequal distribution of wealth apparent in modern civilization, and for all the evils which flow from it:*

*We must make land common property.*

*[...] I do not propose either to purchase or to confiscate private property in land. The first would be unjust; the second, needless. [...] It is not necessary to confiscate land; it is only necessary to confiscate rent. Now, insomuch as the taxation of rent, or land values, must necessarily be increased just as we abolish other taxes, we may put the proposition into practical form by proposing*

*To abolish all taxation save that upon land values."*

# Property Right Regimes create rents

***The question of use and levy of rents is a consequence of a bundle of property rights…,***

**Property right**

| | | |
|---|---|---|
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**Ostrom 2000a, p.338**

## There is no trade-off, and the gift of nature is for all

- According to conventional wisdom, rent taxation is non-distortionary.

- The income from the „gift of nature“ is illegitimate because only reproducible factors in production should earn an income (labor, capital).

→ Rents can be used for distributive purposes like the reduction of poverty, or public investment!

# A Typology of Rent-Yielding Resources

| | Social | Natural |
|---|---|---|
| **Sub-Global** | • **Status Rents**<br>• **Priviledged use of congested social commons**<br>• **Right of way**<br>• **Monopolies** | • **Land**<br>• **Exhaustible Ressources (Hydrocarbons, Uranium, Minerals, Hydro)**<br>• **Renewable Resources (Timberlands)**<br>• **Natural amenities** (if congested) |
| **Global** | • **Internet**<br>• **Patents on genetics**<br>• **Aircraft slots**<br>• **Privileged use of Knowledge Infrastructure** | • **Climate Rent** (GHG & ODS sink)<br>• **Oceans** (minerals, fish etc, sinks)<br>• **Forests Rents** (biodiversity, GHG sink)<br>• **Land** (global food & biomass)<br>• **Freshwater** (global food & biomass)<br>• **Electromagnetic spectrum**<br>• **Antarctica**<br>• **Geostationary Orbit, Moon** |

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# The Wealth of Nations and the Wealth of Commons

## The Wealth of Nations consists of:

- Privately Produced Capital ($K_P$)
- Human Capital ($K_H$)
- Social (Common) Capital ($K_S$), e.g. produced public capital
- Natural (Common) Capital ($K_N$), e.g. land, exhaustible and renewable resources

**Optimality: Pure rate of time preference equal to returns of risk-free asset, social, private, natural, and human capital**

$$\rho = r = F_{K_S}(K_S, K_P, K_H, K_N) - \delta K_S = F_{K_P}(K_S, K_P, K_H, K_N) - \delta K_P = \frac{l}{p} + \frac{\dot{p}}{p} = h$$

**Social rate of return equal for all forms of capital (i.e. “no-arbitrage condition”), otherwise there is over- or under-investment.**

**Key question: Is there over- or under-investment in any form of assets?**

# Non-conventional wisdom and rent taxation

- Feldstein (1977): Land rent taxation *is* distortionary if…
  - landlords also supply other factors such as capital or labor
    → income effect: lower income from land rents affects other supply decisions
  - land and capital are alternative assets for saving
    → land rent tax changes relative prices, some of the tax is shifted on capital
  - land and capital are associated with different risks
    → effect on portfolio decisions
- Edenhofer et al. (2013): Land rent taxation is distortionary, but this may actually *increase* social welfare
  - shift of investment away from land towards capital is a remedy for a sub-optimal savings rate → increases output
  - overall welfare effect depends on use of land tax revenues
  - some redistribution patterns even achieve social optimum

## Rent taxation can be combined with a redistribution scheme: The newborn are endowed with assets

- A rent tax and targeted redistribution can achieve the social optimum if the missing capital of the newborns doesn't exceed the transfers they may receive (up to the entire land rent).

- The negative aggregate consumption effect of the former is then compensated by the latter.

- Instead of a **negative income tax** an **unconditional endowment with assets** of the newborn is welfare enhancing.

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## Is land rent in principle sufficient to finance a public good?

Let the production function be Cobb-Douglas with constant returns to scale in the *private factors* of production:

$$F(K, G, S) = K^{\alpha} S^{1-\alpha} G^{\beta} \tag{4}$$

Define the land rent by LR $= S F_S(K, G, S)$.

### Proposition 1

For the Cobb-Douglas production technology *in the steady state* the socially optimal investment in public capital can be expressed in terms of the land rent:

$$I_g^* = \frac{\delta_g}{\rho + \delta_g} \frac{\beta}{1-\alpha} \text{LR}. \tag{5}$$

Interpretation: If land is more productive than public infrastructure, the infrastructure can be financed through the land rent.

Mattauch, Siegmeier, Edenhofer (2013)

# Optimum reproduced by a land rent tax?
# Decentralized solution

Households invest in capital and land, consume, earn interest and land rents, on which they pay a tax $\tau$ :

$$\dot{K}_t + p_t \dot{S}_t + C_t = r_t K_t + (1-\tau) l_t S_t.$$

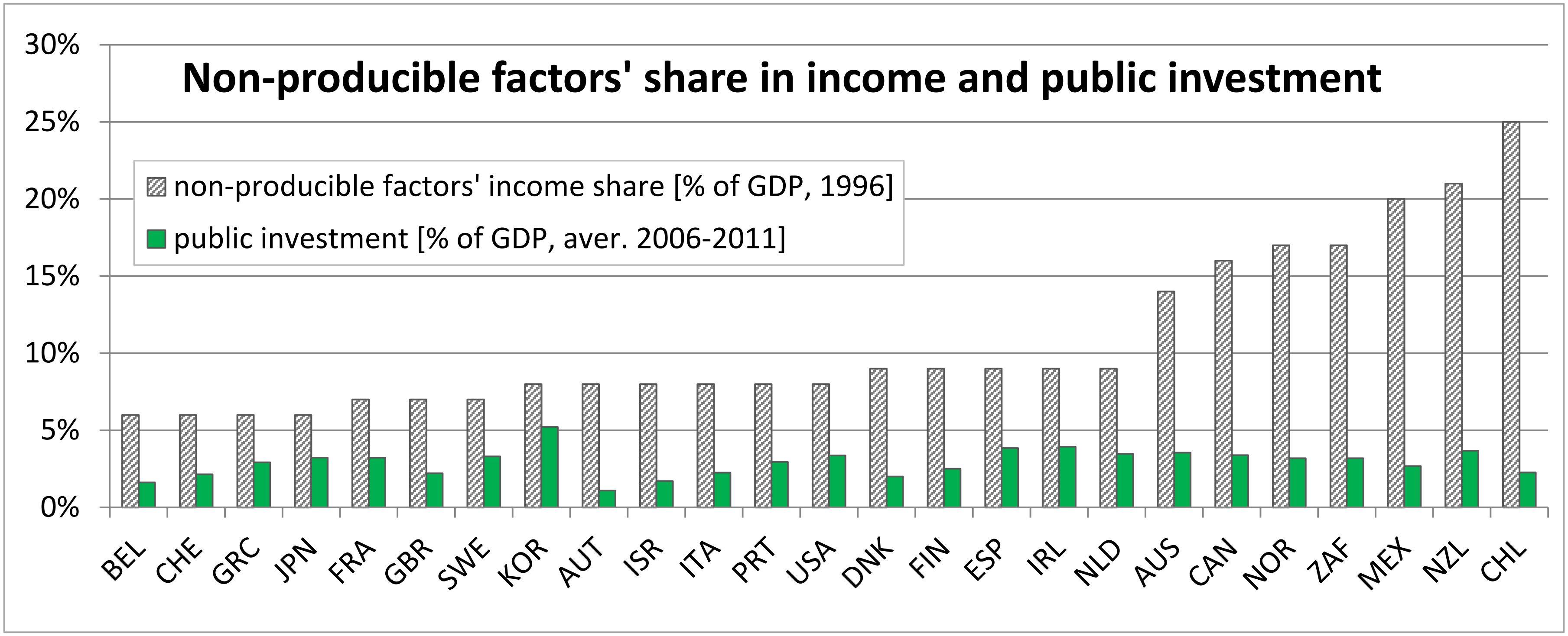
The tax revenues can be used to finance a public good.

**Proposition 2**

A land rent tax allows to reproduce the social optimum if the revenue from land rent taxation is sufficient to finance the optimal public investments.

Mattauch, Siegmeier, Edenhofer (2013)

# Magnitude of resource & land rents vs. public investment




Data sources: (1) Non-producible factors' income share: Caselli and Feyrer (2007); (2) Public investment: OECD (2013); ISO3 country codes.

→ **Rent taxation could be an important contribution to financing public goods!**

## Social under-investment in infrastructure?

Highway construction in the USA (Gramlich 1994):

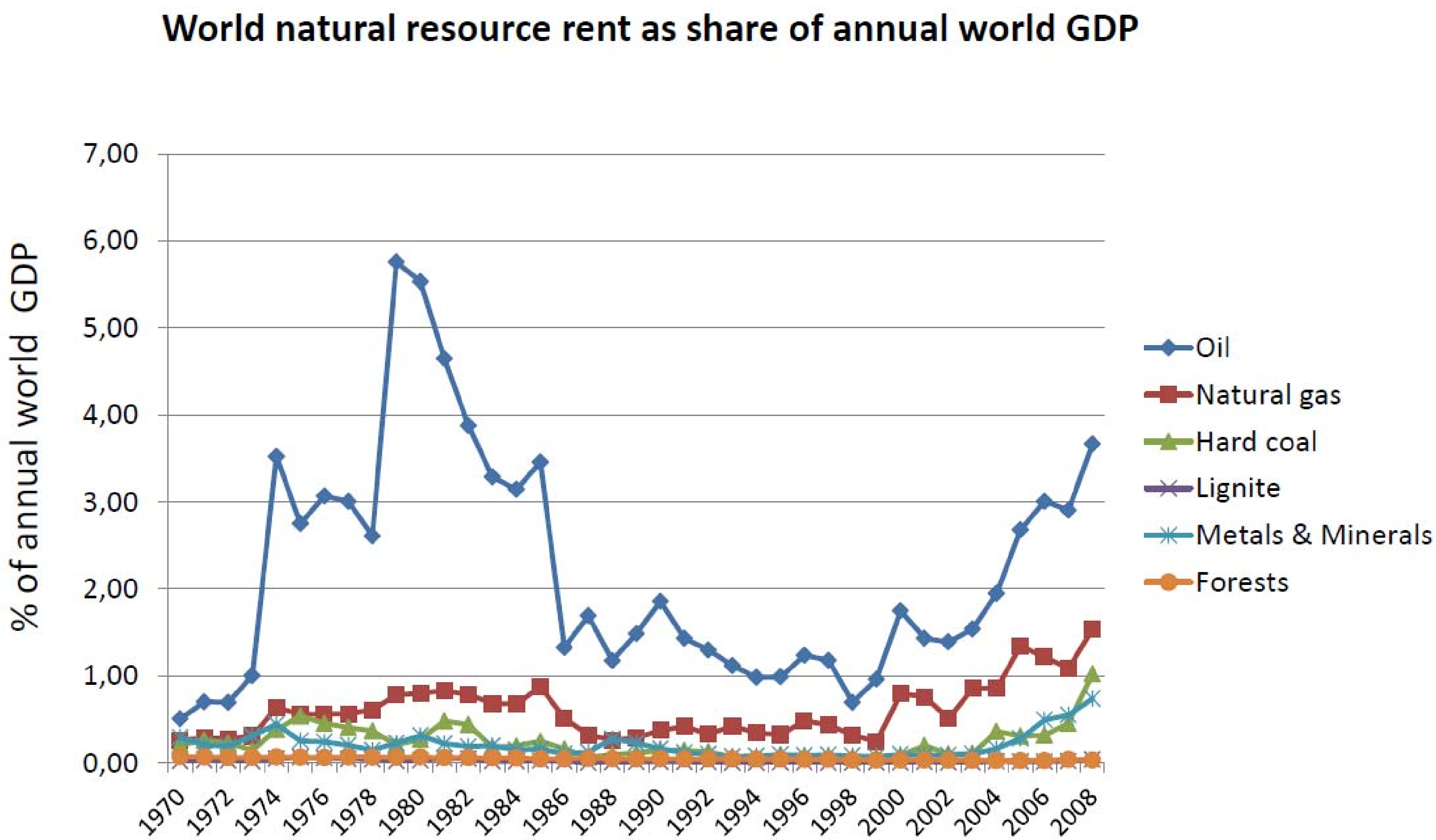
- maintenance projects: **35%**
- new urban construction projects: **15%**
- Rural construction projects: (low)

Return on ”ordinary“ investments in USA (1926-2000): **8.8 %**

Positive correlation between growth and infrastructure stocks (Calderon and Serven 2004):

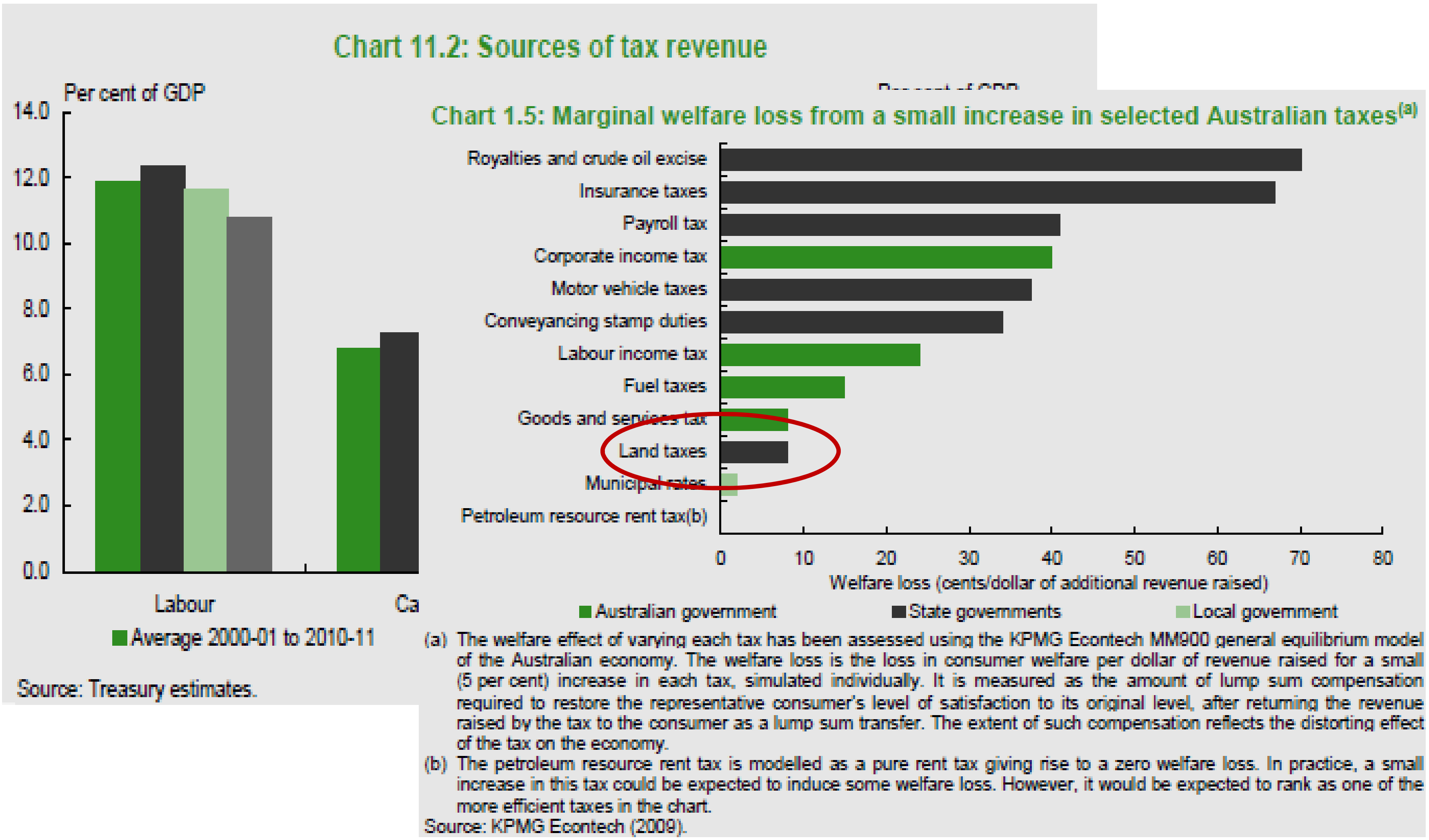
- 0.15 for phones,
- 0.13 for power generating capacity,
- 0.21 for road length

# Orders of magnitude of resource rents



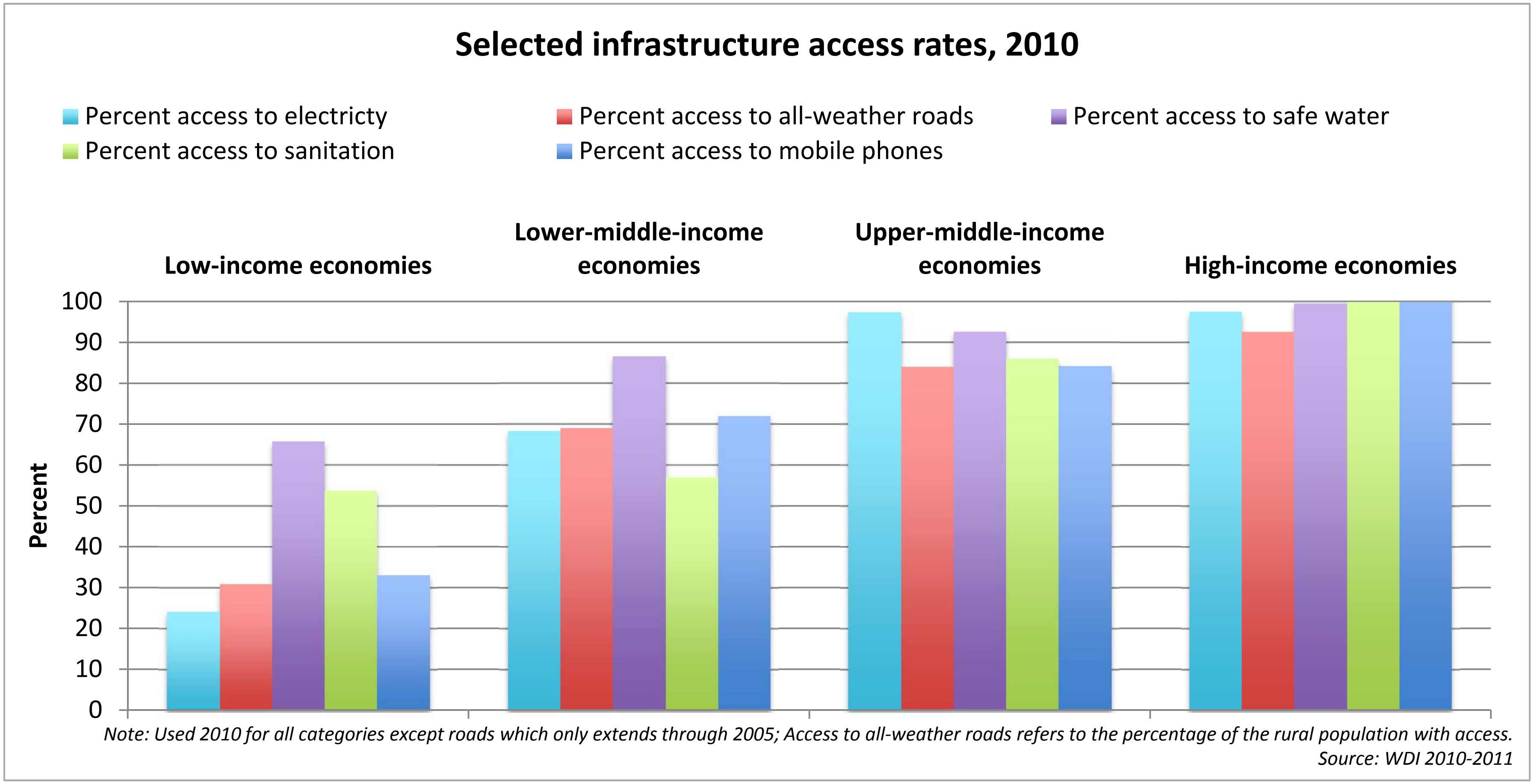

Data: World Bank

# Example: Proposed rent taxation in Australia




(Henry Tax Review, 2009)

# Example: Access to basic infrastructures, on aggregate…




Source: Rothman et al. (2012)

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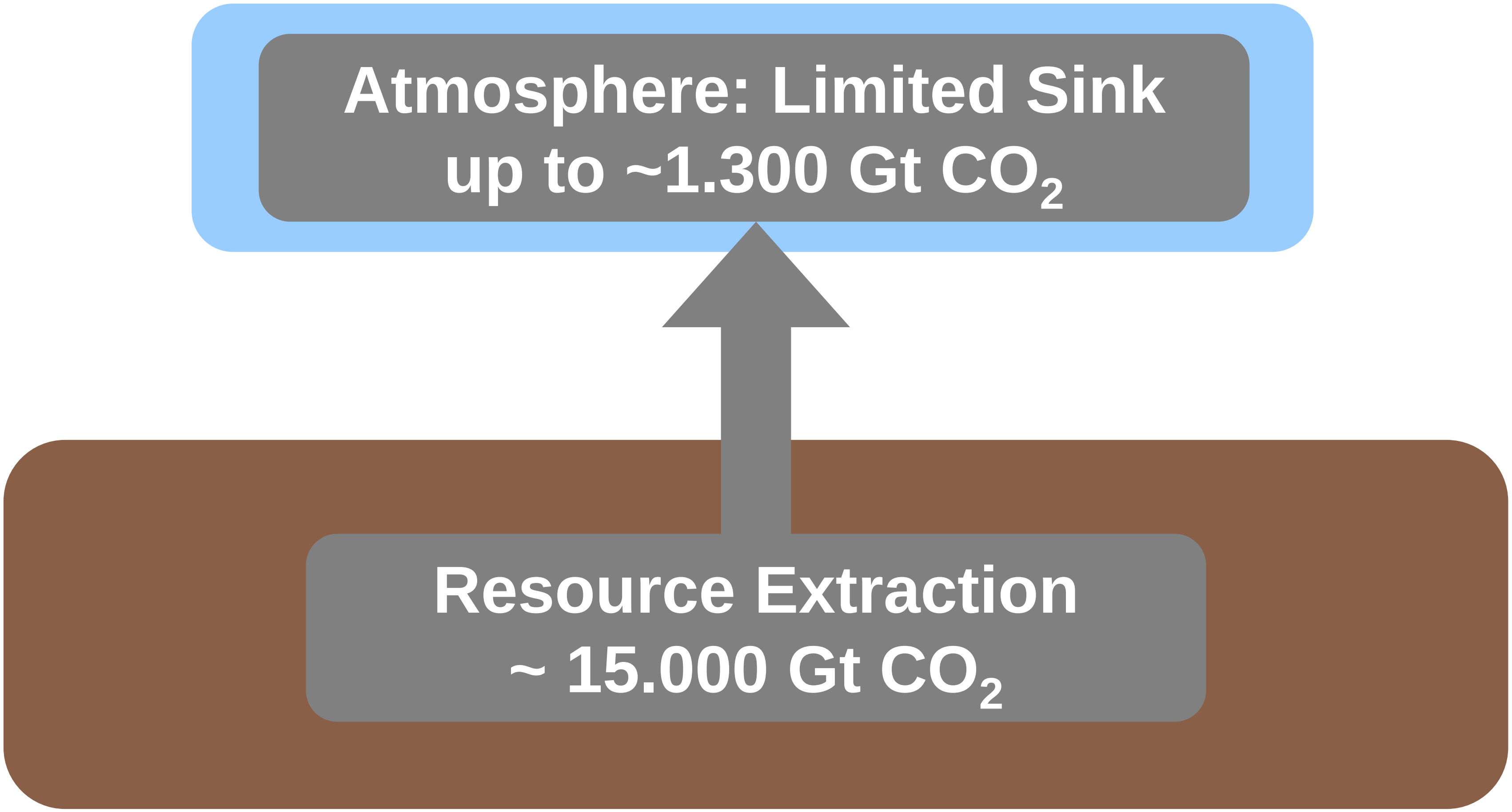
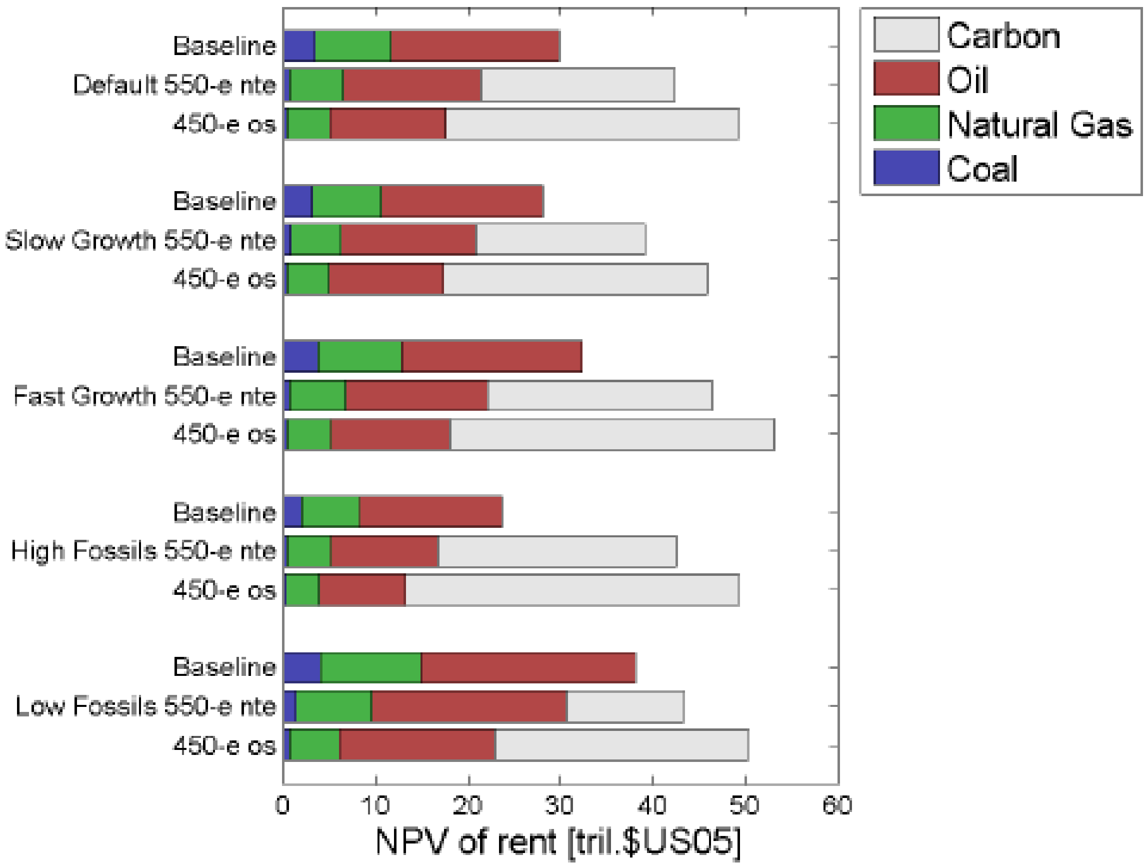
# The Atmosphere as a Global Common



# Appropriation of future climate rent?




Bauer et al. (2013)

Figure 7: Net present value (2010-2100) of global fossil fuel rents and the global carbon permit rent. The discount rate is 5%.

Climate policy would create additional rents (by limiting supply) and transform resource rents into a climate rent → who gets what share?

# Summary

- **Conventional economic wisdom perceives rent taxation as neutral.** Therefore, this „just“ tax has the largest potential to overcome the trade-off between justice and efficiency. Additionally, only reproducible factors in production should earn income (labor and capital).
- The taxation of rents is perceived as a way to **„socialise“ the commons** even with private property rights.
- However, the potential of rent taxation is not neutral. Therefore, the potential for reaping a **triple dividend** is widely underestimated:
  - → Rent taxation can be combined with **intergenerational transfer schemes** in which the newborn are endowed with assets financed by rents.
  - → Additionally, rent taxation can be used to **finance public infrastructure**. Infrastructure can be seen as an investment in capabilities for the reduction of poverty.
  - → Climate policy enhances the „Climate Rent“ which does not only **mitigate climate change** but also provides additional sources for infrastructure investments and intergenerational transfer schemes.
- The triple dividend might become the **main motivation for climate policy.**