A public finance perspective on climate policy

Six interactions that may enhance welfare

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Fundamental imbalance in climate change economics

Comprehensive concept of benefits of mitigation policies:

- Avoided physical damages from future global warming, weighted by their economic impact services, etc.

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Narrow concept of costs of mitigation policies:

- Only opportunity costs of foregone consumption.
- Treats climate change as an externality in isolation.
- Neglects *fiscal* interactions with policies for non-climate objectives: health, education, infrastructure, redistribution, etc.

Contribution of this article

- **Thesis:**
  Fiscal interactions of climate policy with non-climate goals ...
  1. may increase welfare beyond purely environmental benefits,
  2. and affect intra- and intergenerational distribution.

- Effects occur on the public revenue and public spending side, and affect all types of climate policy instruments.

- **(Major) Premise:**
  Separate cost-benefit estimates for climate- and other policies *do not add up* due to equilibrium effects
  (and are undesirable for political economy reasons).

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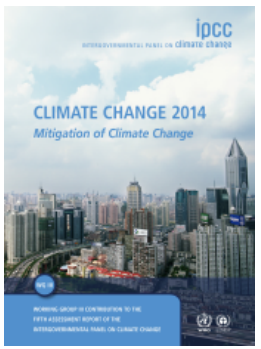
A bad idea if things interact.
It leads to unsound and distorted policy advice.

Previous work: Costs and revenues of climate change mitigation

Main focus of climate policy: Cost assessments with IAMs

- *Gross* costs of climate change mitigation: first-best compared to business as usual.
- *Net* costs of climate change mitigation: Gross costs minus avoided damages.



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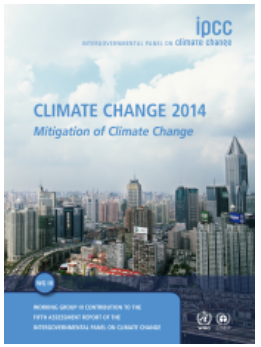

Less attention: Revenue from ambitious mitigation policy

- Carbon rent of ambitious mitigation policy: 2.3 % of GDP (Bauer et al., 2013), $\approx 15\%$ of taxes levied today

Previous work: Incomplete and unsystematic

The Double Dividend hypothesis (e.g. Bovenberg 1999):

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Recent models include other selected public finance elements:

- Infrastructure policy (Waisman et al. 2012)
- Public debt (Carbone et al. 2013; Rausch et al. 2013),
- Intragenerational inequality reduction (Bento 2013)
- Intergenerational Pareto-improvements (Karp and Rezai 2014)

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There are other spending options, and effects on the revenue-raising side!

Six types of effects

interaction of climate policy and non-climate inefficiencies

Public revenue-raising:

1. Open economy: Reduced tax competition
2. Closed economy: Portfolio effects

Public expenditures:

3. Restructuring the composition of public spending
4. Spending on underfunded public capital stocks, reducing public debt

Intra- and intergenerational effects:

5. Spending to reduce intragenerational inequality
6. Intergenerational Pareto-improvement through different transfer mechanisms

Climate policy under tax competition (open economy)

Inefficiency: Tax competition leading to underprovision of local public goods

Thesis: Taxation of fossil resources is preferable to capital taxation as it raises welfare:

- Capital is mobile, leading to a downward pressure on capital taxes.
- Fossil resources give rise to scarcity rent, capital does not.
- Carbon tax captures part of the resource rent.
- These revenues are invested in local productive public goods.
- Franks et. al. (2015) show that no green paradox occurs.

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Portfolio effect of rent taxation (closed economy)

Inefficiency: Underaccumulation of private capital

What is a portfolio effect?

- Tax on a flow of revenues of an asset
  $\rightarrow$ future flow of revenues and thus price of asset lowered
  $\rightarrow$ investment directed into alternative assets (arbitrage!).
- Beneficial if the alternative stock's level increases and was previously too low.

Application to climate policy: Siegmeier et al. (2015)

Portfolio effect exists if there are markets for fossil stocks (e.g. oil field and coal mines).

Public Expenditures: Structure

Inefficiency: Mismatch of composition of public spending and climate policy

- Private decisions depend on public spending.
- Restructuring public spending to complement "direct" carbon pricing lowers mitigation costs.
- Example: Transport infrastructure.
- Existing literature sparse, some numerical results, analytical treatment missing so far.

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- E.g. physical infrastructure, education, the health sector
- Public capital is in fact undersupplied in many regions.

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Revenues from mitigation policy to reduce public debt may reduces mitigation costs, if

- debt reduction is a goal in itself (Carbone et al. 2013) **or**
- debt negatively impacts economic performance (Rausch et al. 2013).

Intragenerational inequality

Inefficiency: Suboptimally high inequality

- Climate policies are widely regarded as *regressive* (Bento et al. 2013)
- However, this can be alleviated through the design of environmental policies and redistribution schemes.

Solutions

1. Redistribution: Labor taxes cuts make the carbon tax progressive (Chiroleu-Assouline and Fodha 2014, Klenert et al. 2015).
2. Counteract inequality through public expenditure for the poor, in particular through education (unexplored).

Intergenerational Pareto-improvement

"Inefficiency": Current generations pay for avoided damages in the future

Claim:

In principle, there are no costs of climate change. Reason: Correcting an externality is efficiency-enhancing and without costs. (Foley 2007, Broome 2012)

However:

Net costs (mitigation costs minus avoided damages) positive in the present, negative in the future.

Solution:

The net costs may be made negative for each generation by intergenerational transfers.

Conclusion

Our contribution

- Take climate- and public economics out of watertight compartments.
- Identify six interaction effects that may enhance welfare.

Implications for Policy Assessment

- IAMs highly focus on technological options, but should consider fiscal effects and welfare viewpoints beyond CBA/CEA.
- Public economics should take into account the scale of changes in national budgets, which ambitious climate policy will cause.

Methodology: When to treat two fields in isolation?

"Economists, like everyone else, sometimes keep ideas in watertight compartments" (Tullock 1967)

- Should economics focus on specific questions or attempt to get the bigger picture approximately right?
- Practitioner's Perspective: interactions between two fields matter, if these are sufficiently large.
- For climate change and public finance: no good theoretical reasons against taking into account their interactions.
- General case: arguably the largest methodological problem for descriptive economics (Hausman 2013).

Intergenerational Pareto improvements: Is such a transfer possible?

Three possibilities

- Less investment in productive capital stocks (Rezai et al. 2012; von Below et al. 2013).
- Mitigation policy increases the value of assets of current owners (Karp and Rezai 2014, Schultes, Leimbach, Edenhofer 2014).
- Under broken Ricardian equivalence: Higher national debts (Bovenberg and Heijdra 1998).

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