POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

Why finance ministers favor carbon taxes, even if they do not take climate change into account

Max Franks, Ottmar Edenhofer, Kai Lessmann

29.01.2015

Capital mobility leading to tax competition and tighter budgets

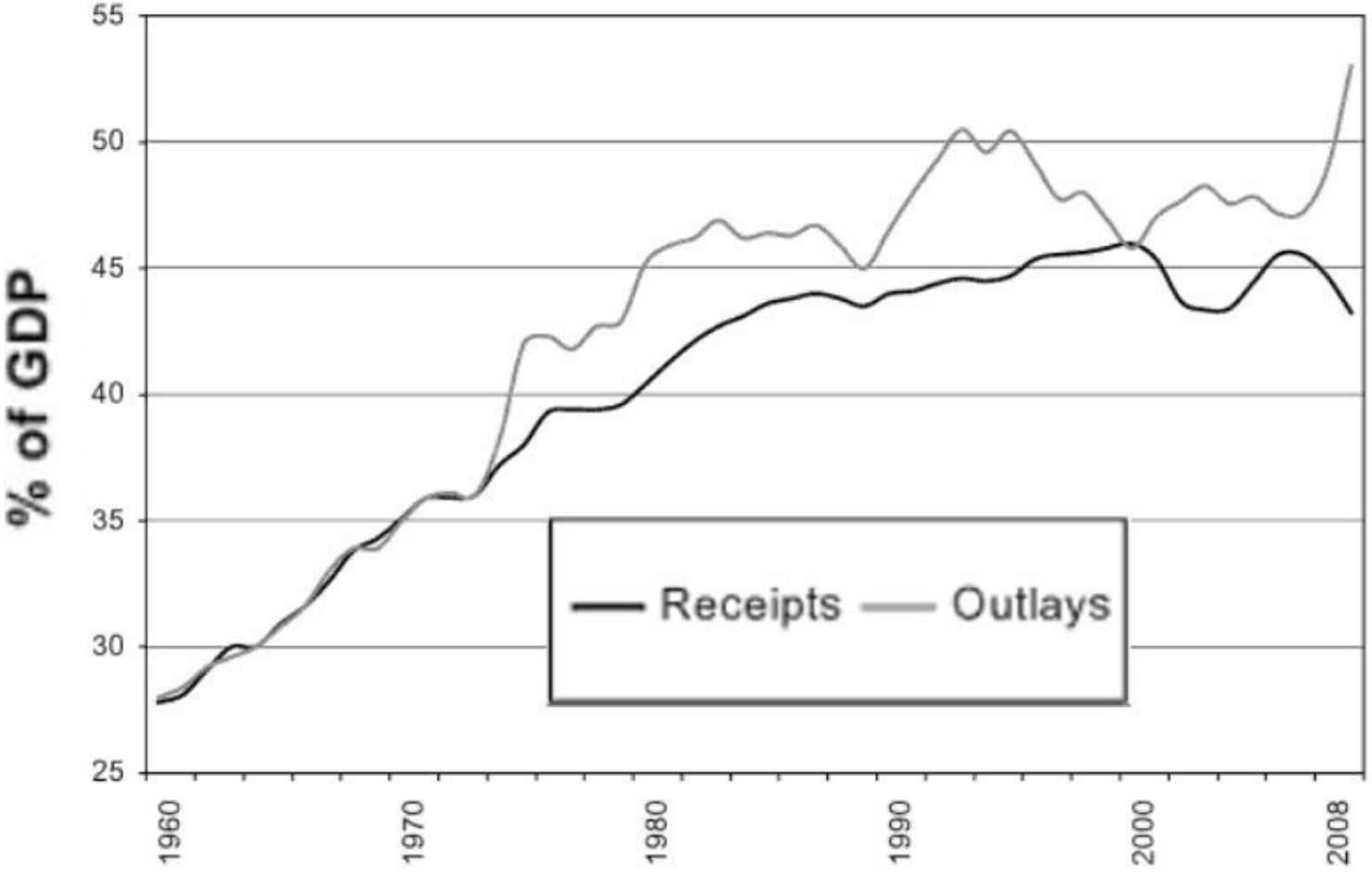

Figure 3.8 Public expenditure and receipts in the OECD countries.

Source: Benassy-Quere et. al. (2010)

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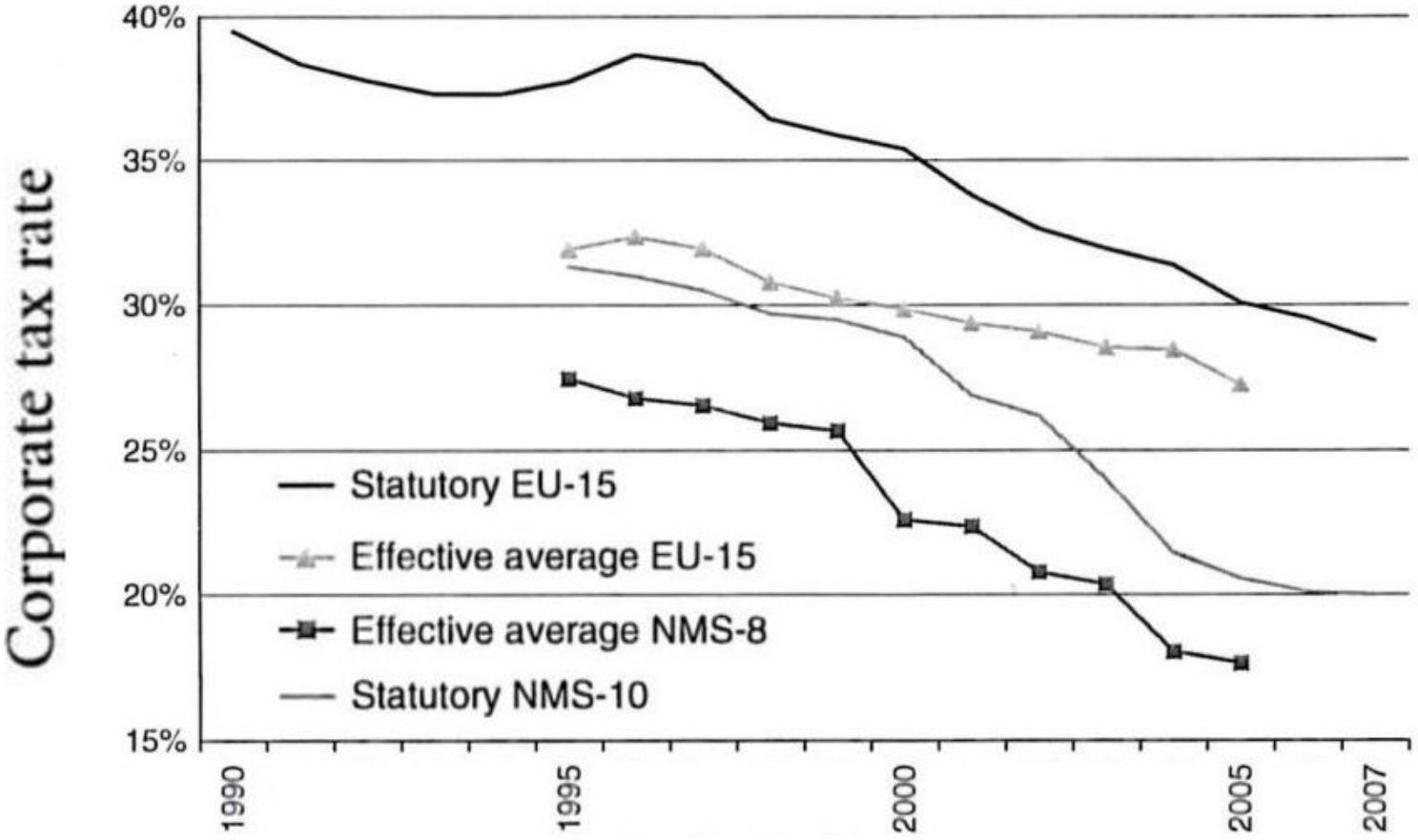

Figure 7.17 Taxing mobile and immobile tax bases in the EU.

Source: Benassy-Quere et. al. (2010)

Demand for public expenditures, e.g. infrastructure

The Economist | World politics | Business & finance | Economics | Science & technology | Culture | Blogs | Debate | Multimedia | Print edition

Infrastructure

Highways to hell

A harsh winter and tight budgets mean lots of potholes

Apr 19th 2014 | CHICAGO | From the print edition

ONLY the drunk, they say, drive in a straight line in Chicago. The sober

Süddeutsche.de

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28. Juli 2013 13:12 Autobahnen, Brücken, Bahngleise

Deutschland kaputt

Motivation and research questions

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- What are the supply side dynamics when resource importing countries tax carbon?

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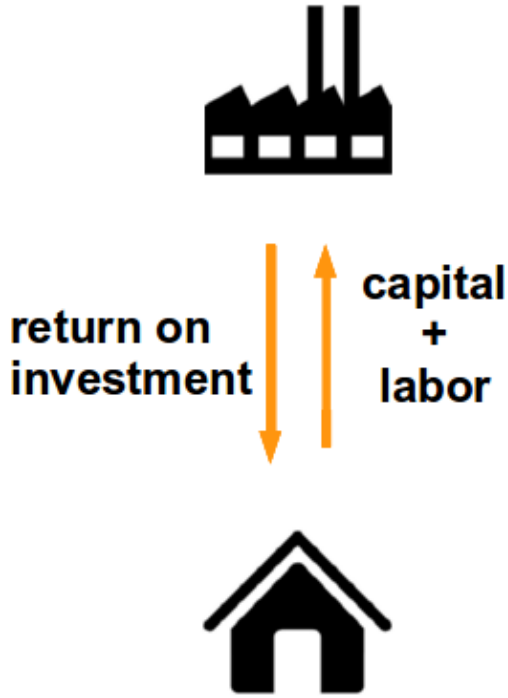
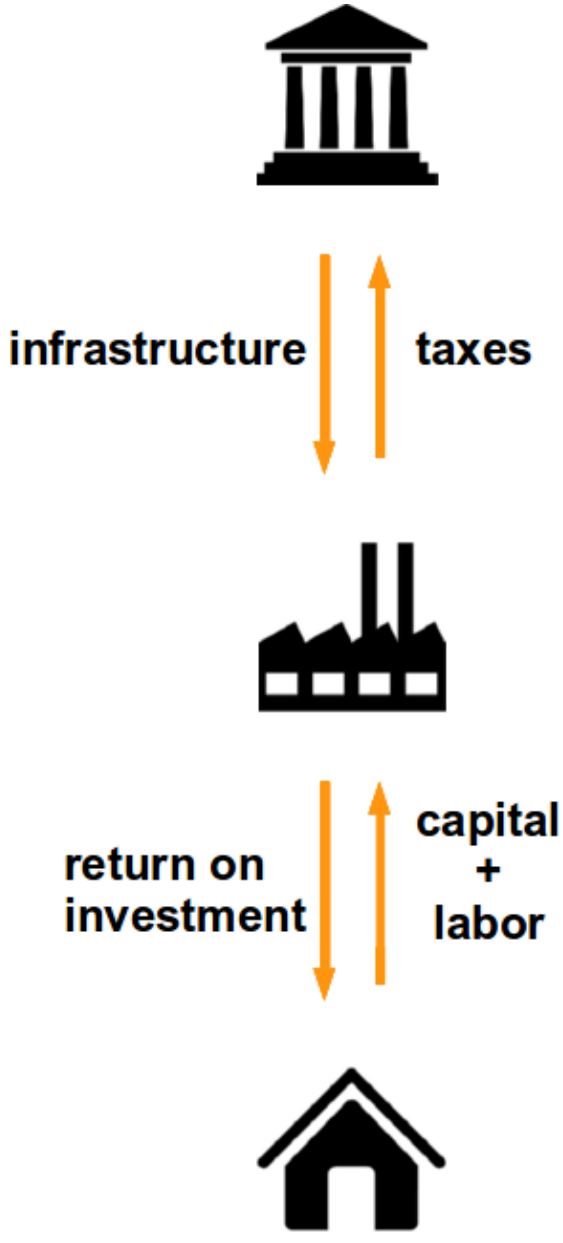
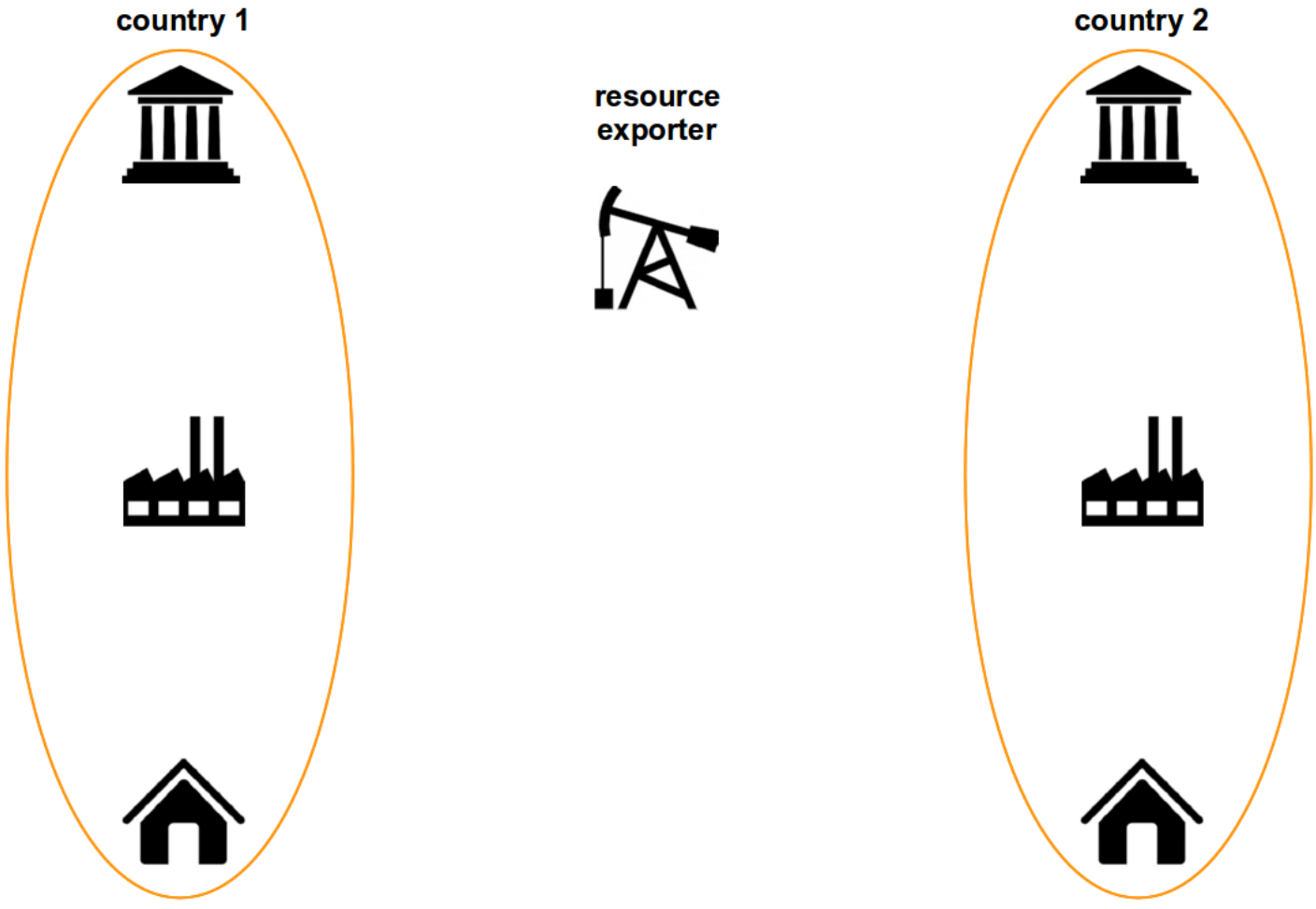
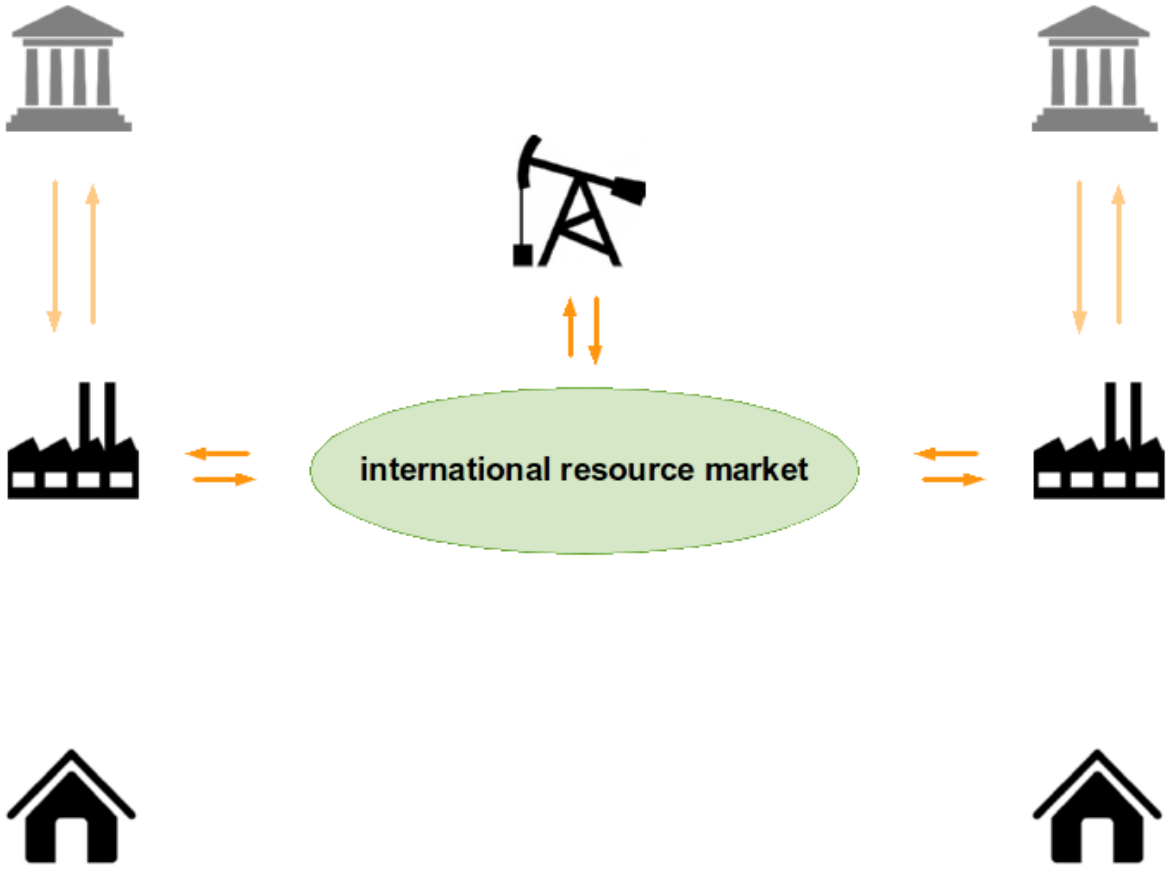
3. Both results are robust under different strategic settings: (Non-)cooperative importers, (non-)strategic exporter.

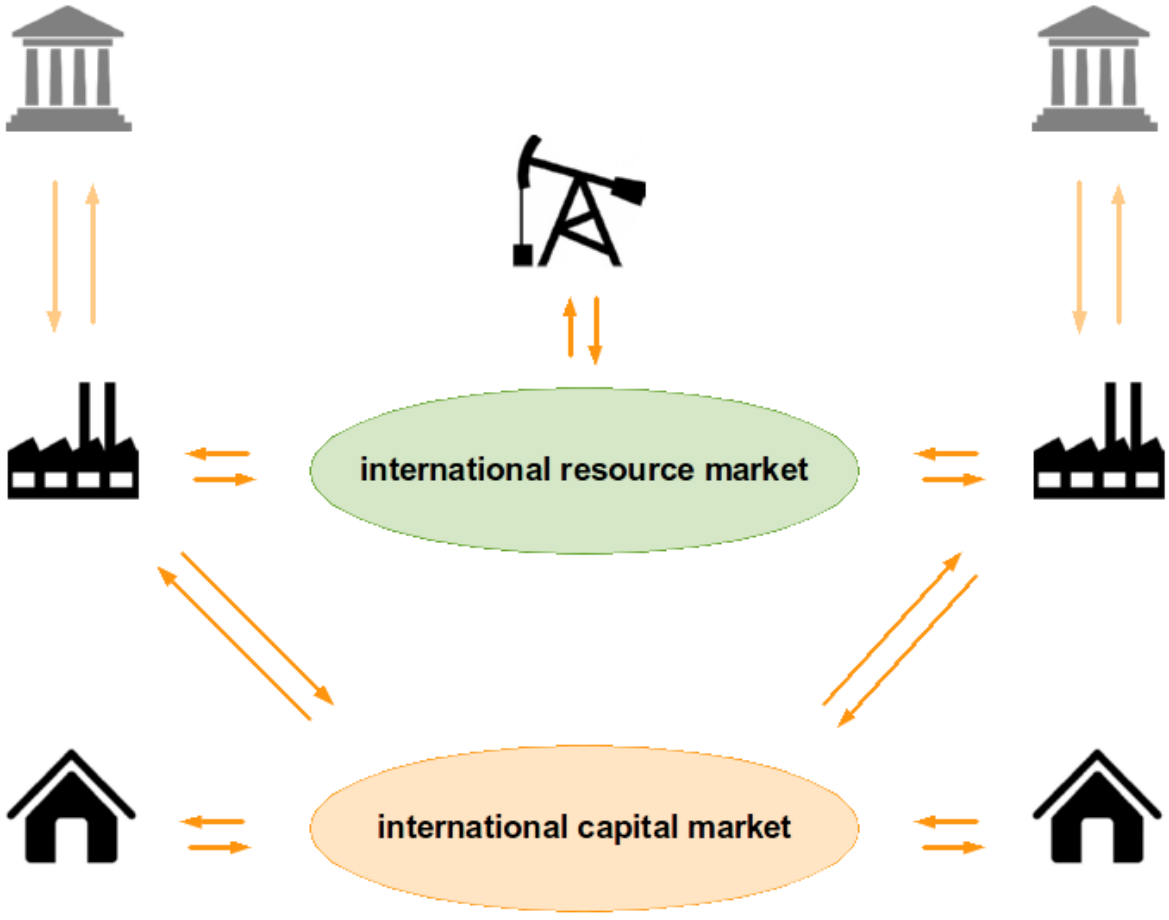
MODEL SETUP

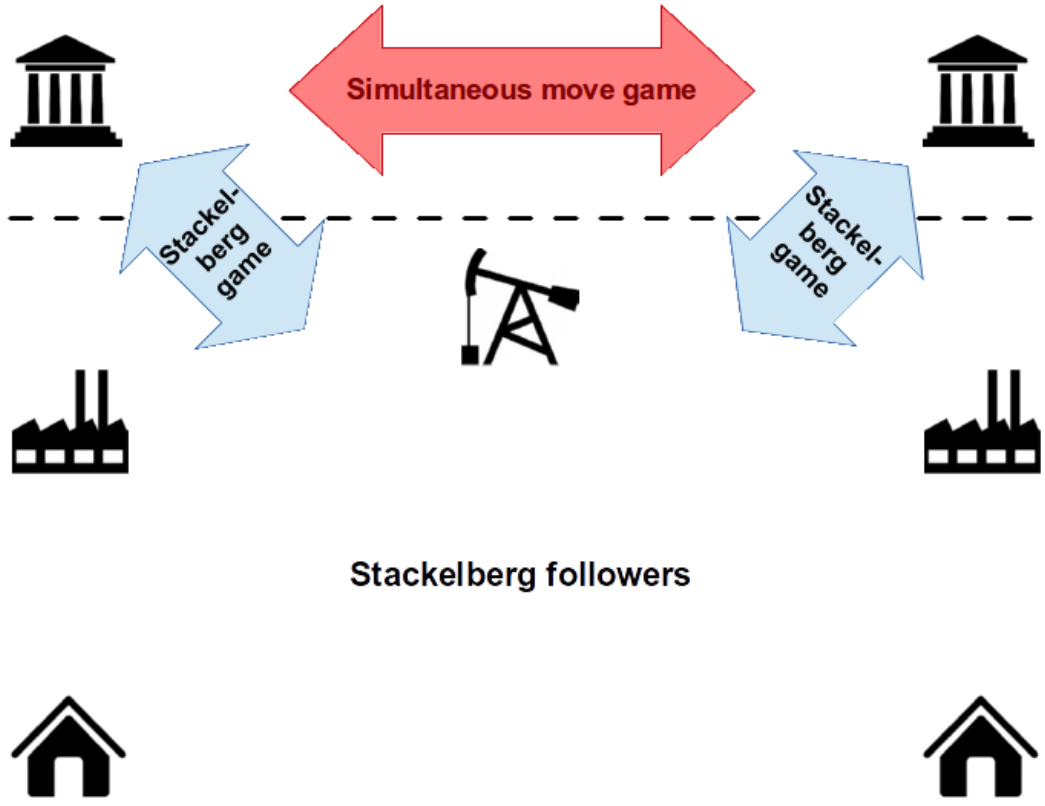

return on
investment
capital
+
labor


infrastructure
taxes
return on investment
capital + labor

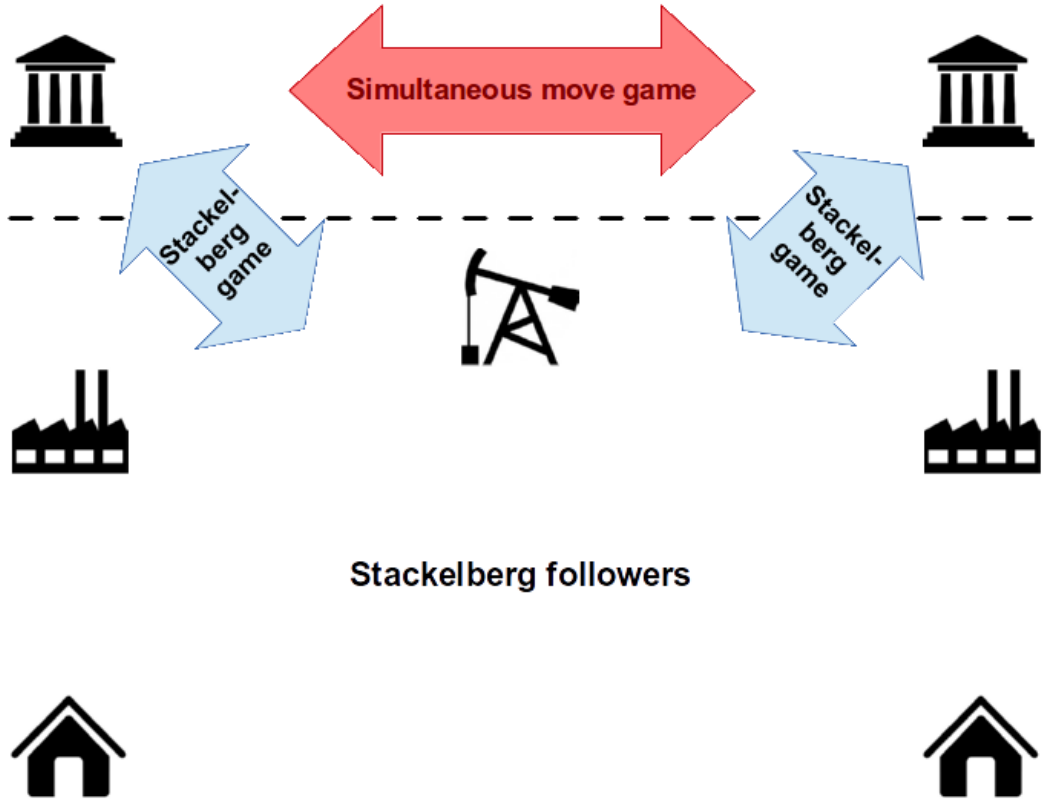

country 1
resource exporter
country 2


international resource market


international resource market
international capital market



Nash equilibrium, two sub-games,



Nash equilibrium, two sub-games, solved for

non-cooperative behavior

$$\max_{\{\tau^i\}} W_i, \text{ given } \{\tau^j\}, \quad i \neq j$$

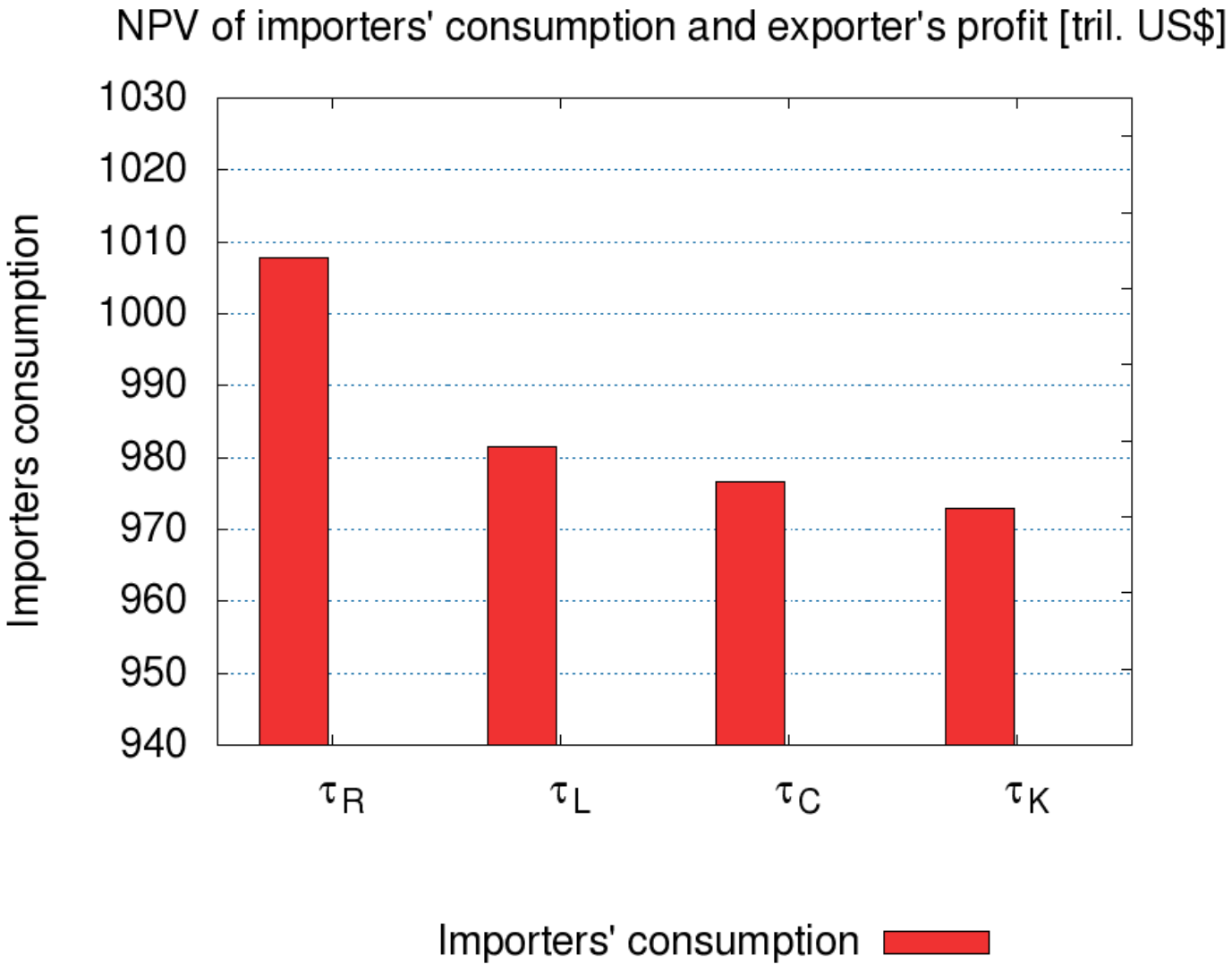
or

cooperative behavior of governments

$$\max_{\{\tau^i\}_{i=1,2}} W_1 + W_2$$

RESULTS

Single instrument portfolio



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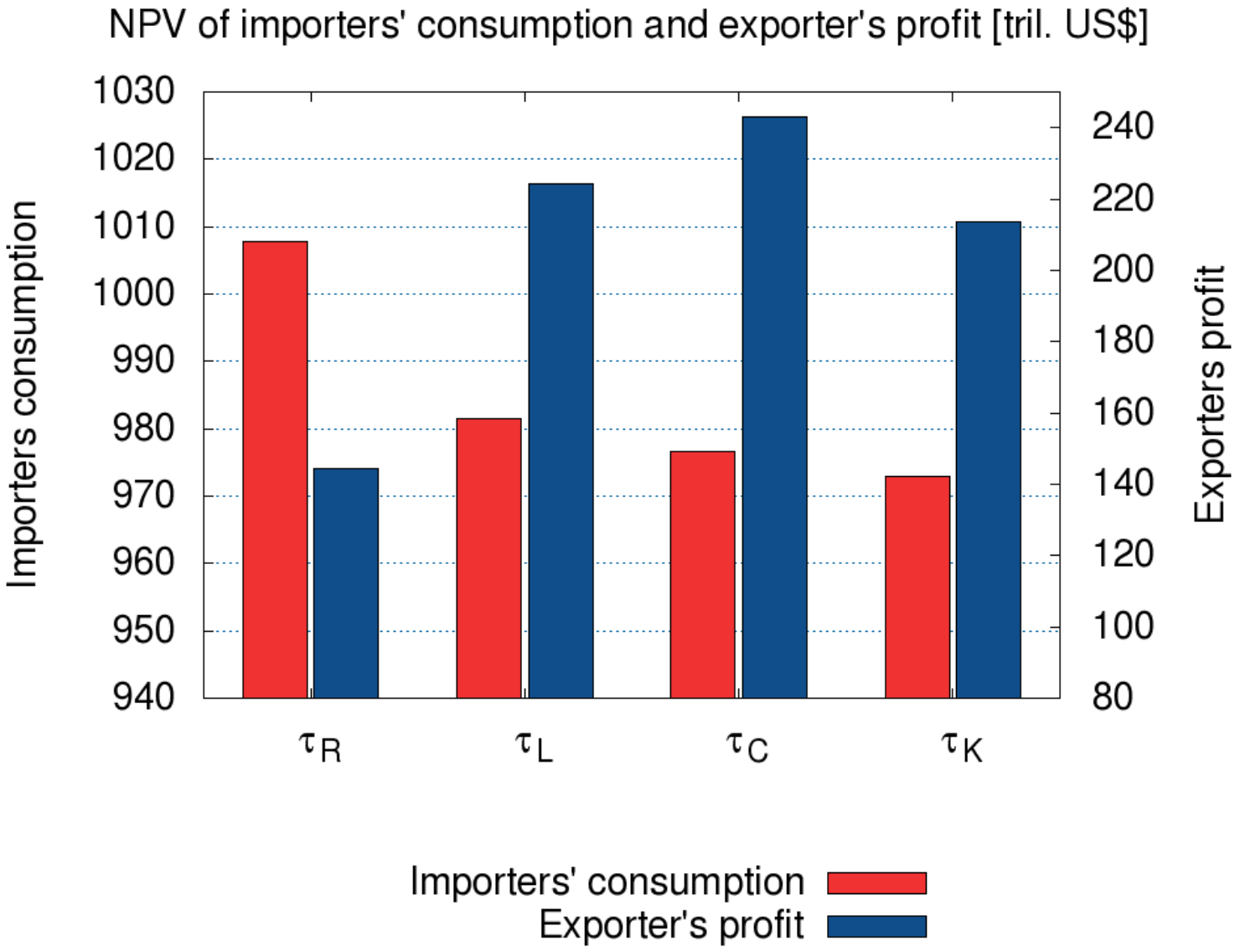
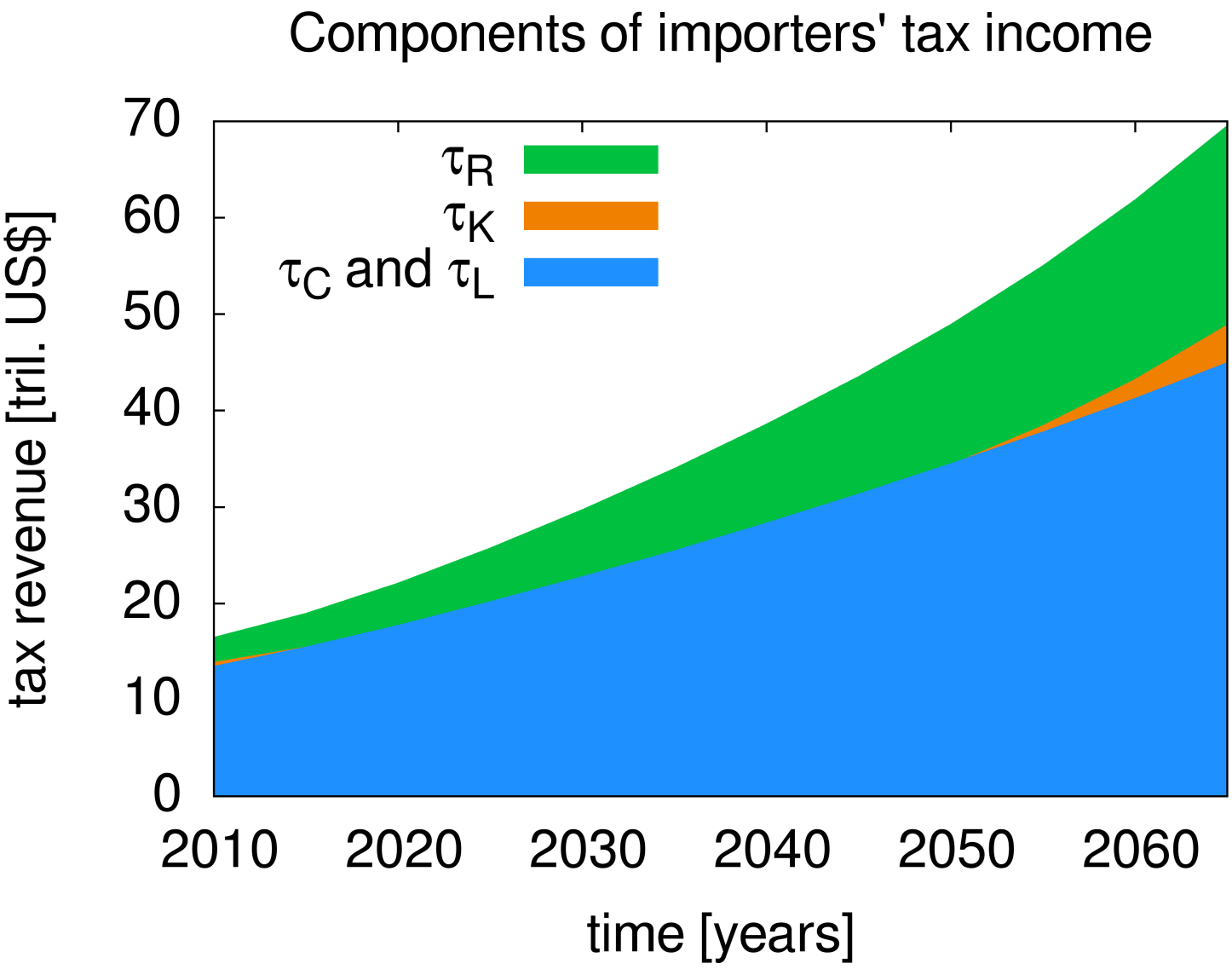
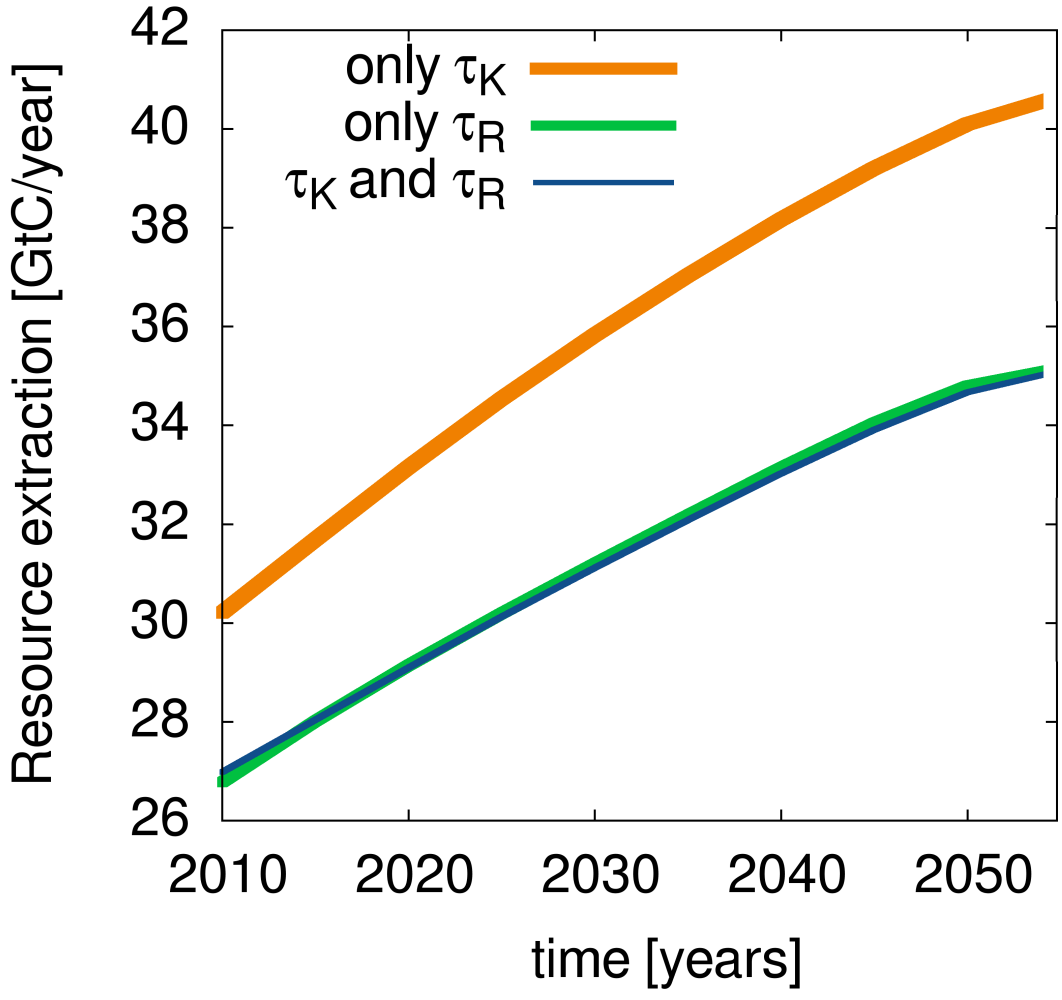


Mixed portfolio



Timing and volume effects



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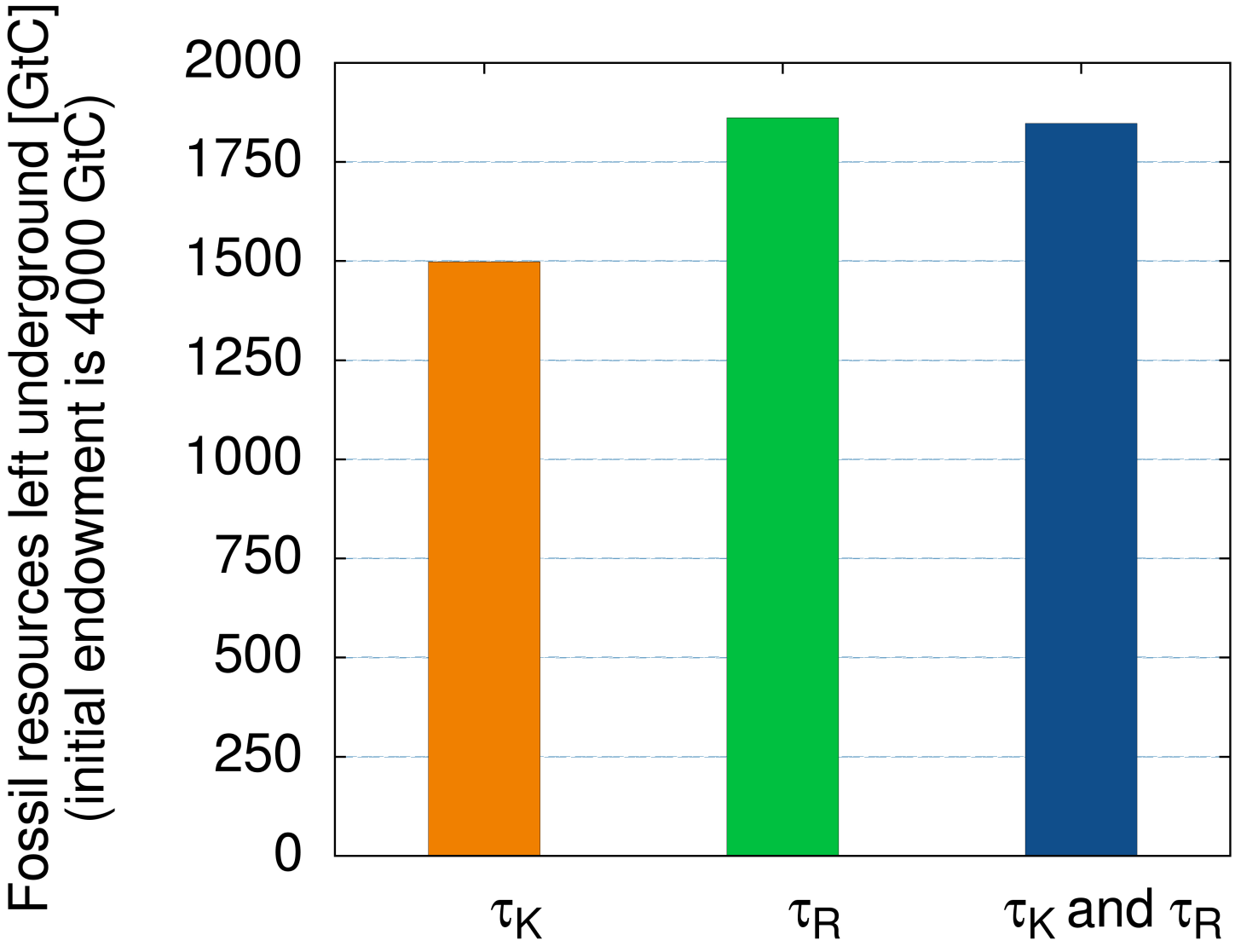

Summary of results

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1. Carbon tax more efficient than capital tax.
   - asymmetry between capital and carbon as tax base,
   - only the resource stock gives rise to rent.
2. Carbon tax delays extraction, reduces cumulative emissions.
3. Results are robust under different sorts of strategic behavior: Cooperating importers, strategic exporter.

Discussion

Results apply to economies in which

1. addressing fiscal externalities has higher priority than the climate externality,

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Discussion

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1. addressing fiscal externalities has higher priority than the climate externality,
2. capital flight threatens governments and constrains their scope of action,
3. productive public investments (infrastructure, education, health) are required,
4. a substantial share of fossil resources is imported.

Policy conclusions

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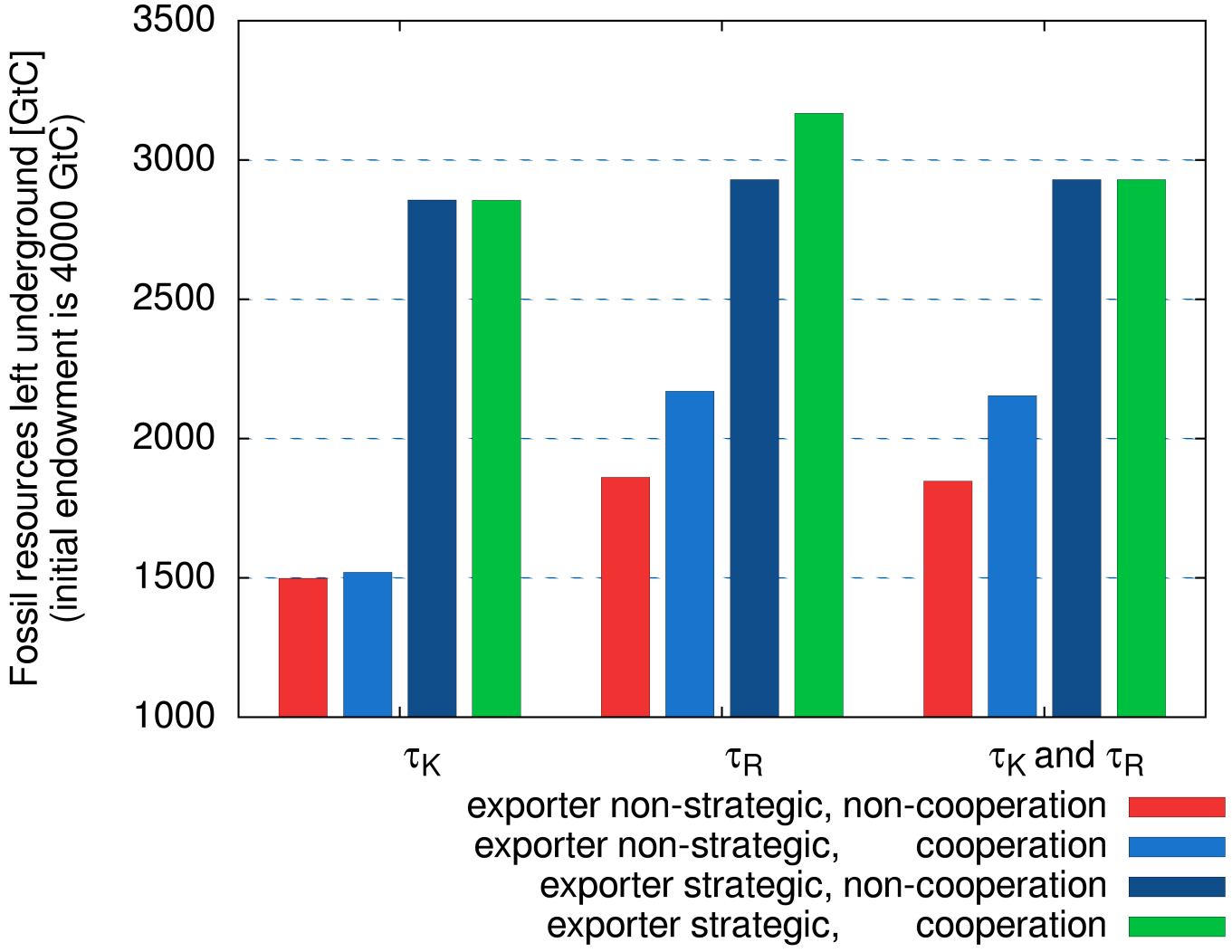
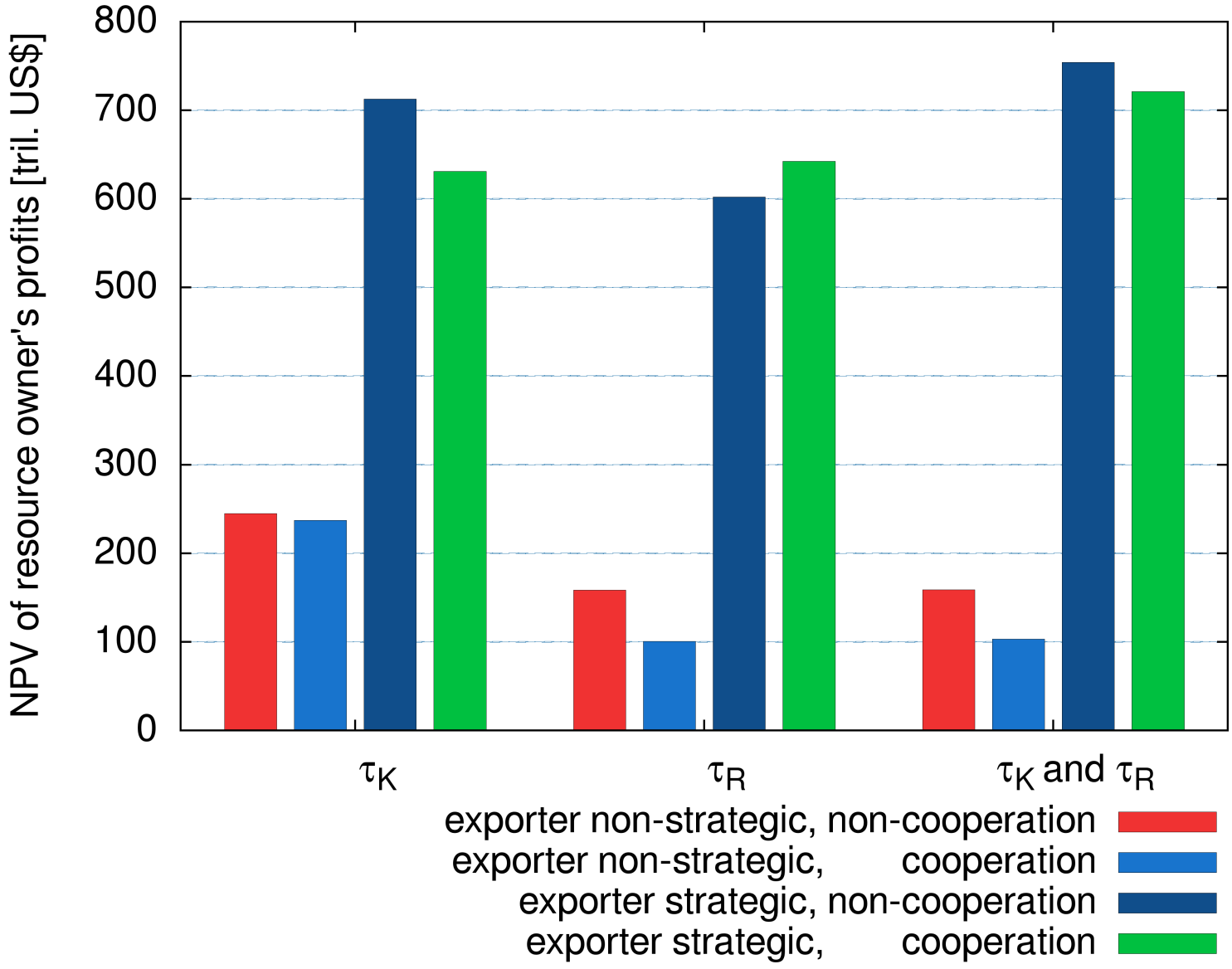
- The supply side dynamics of carbon pricing matter, but pose no environmental problem.
- Rethink role of environmental policy:
  Not only environmental ministers should favor carbon pricing, but also finance ministers.

Appendix

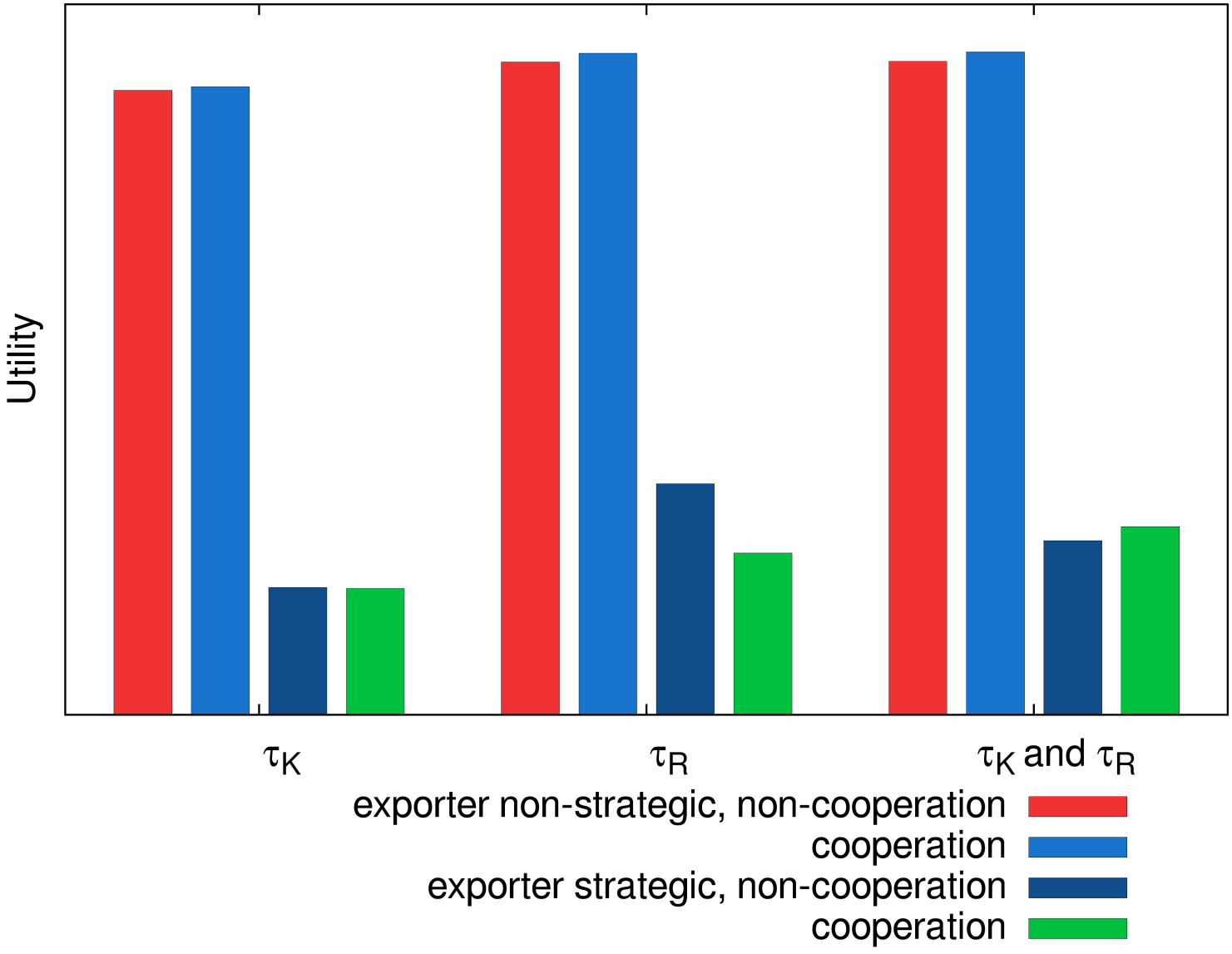
Volume effects under behavioral assumptions



The resource rent



Welfare evaluation



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