

Fiscal policies for a sustainable recovery and a green transformation

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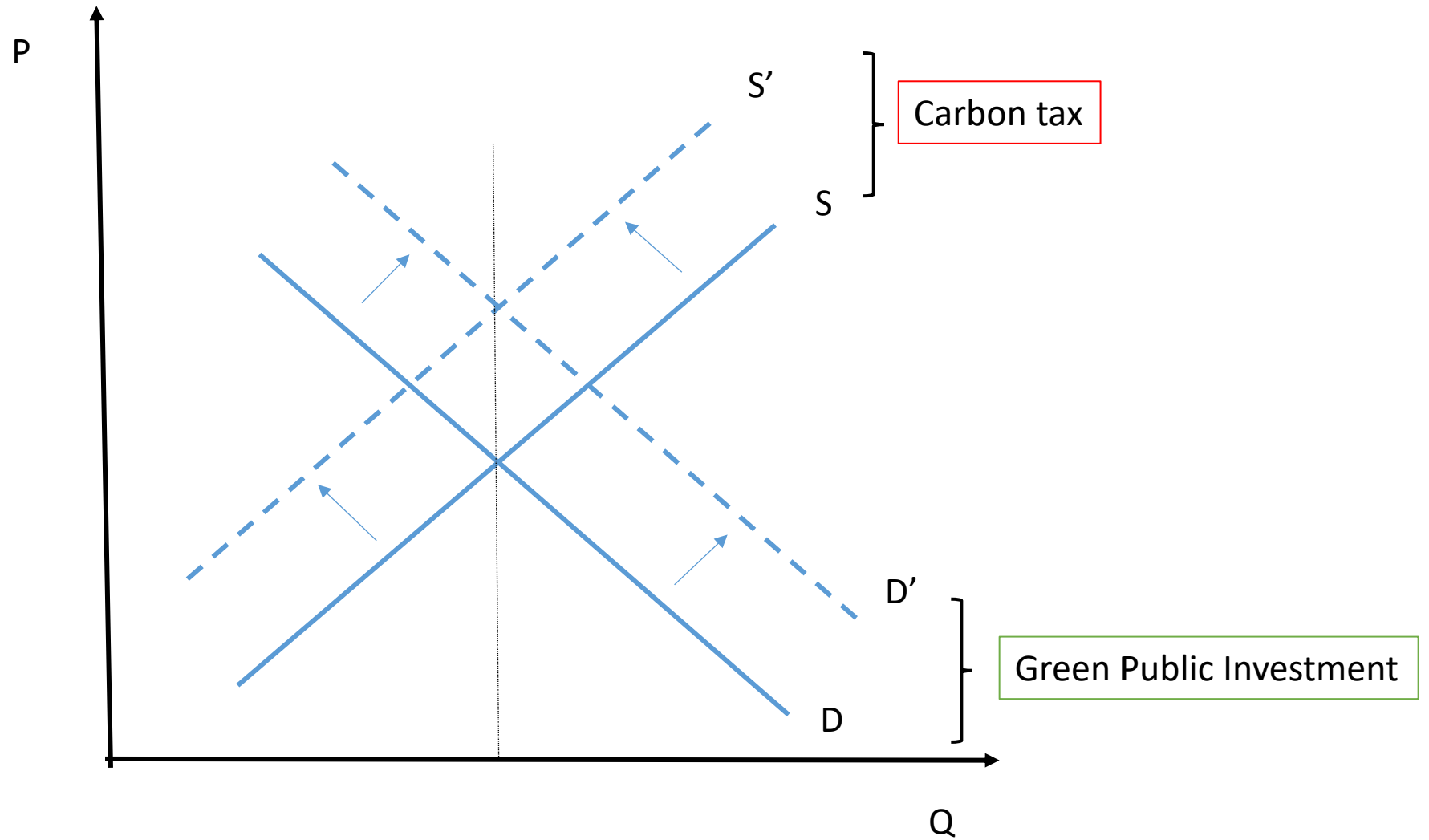


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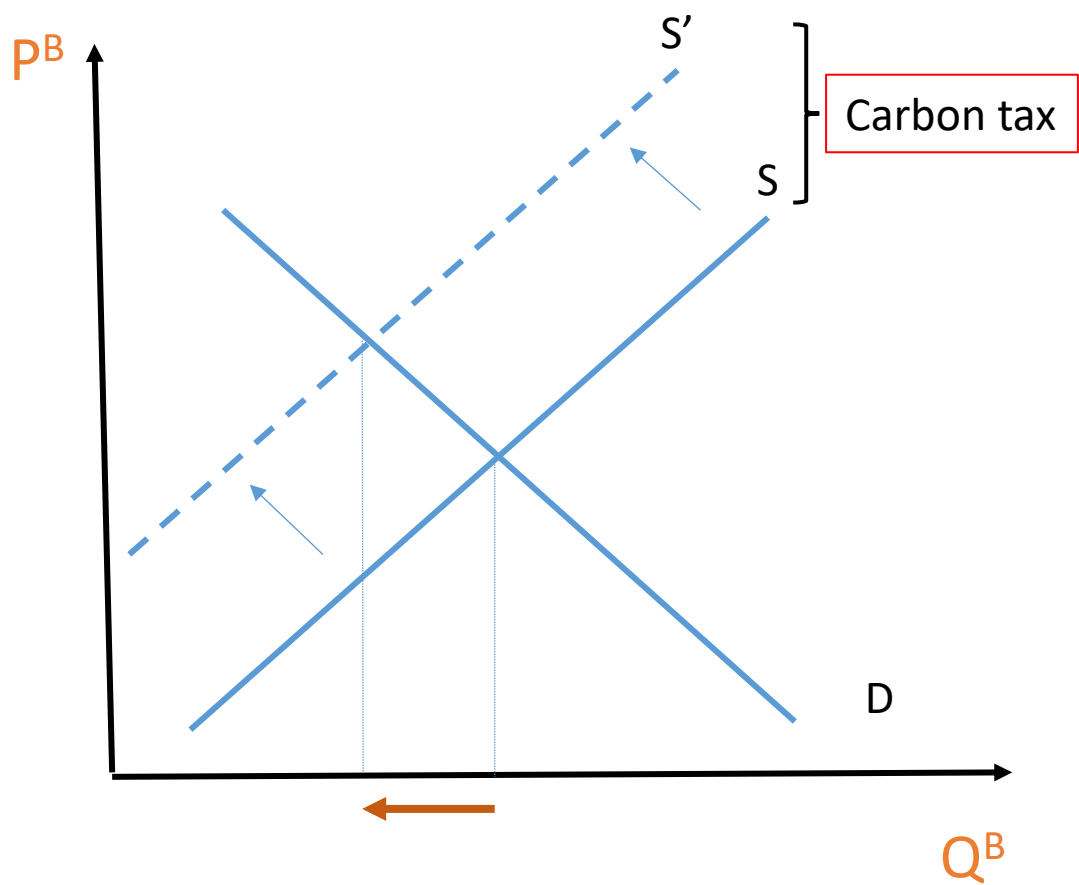


How to combine fiscal measures to foster climate change mitigation?

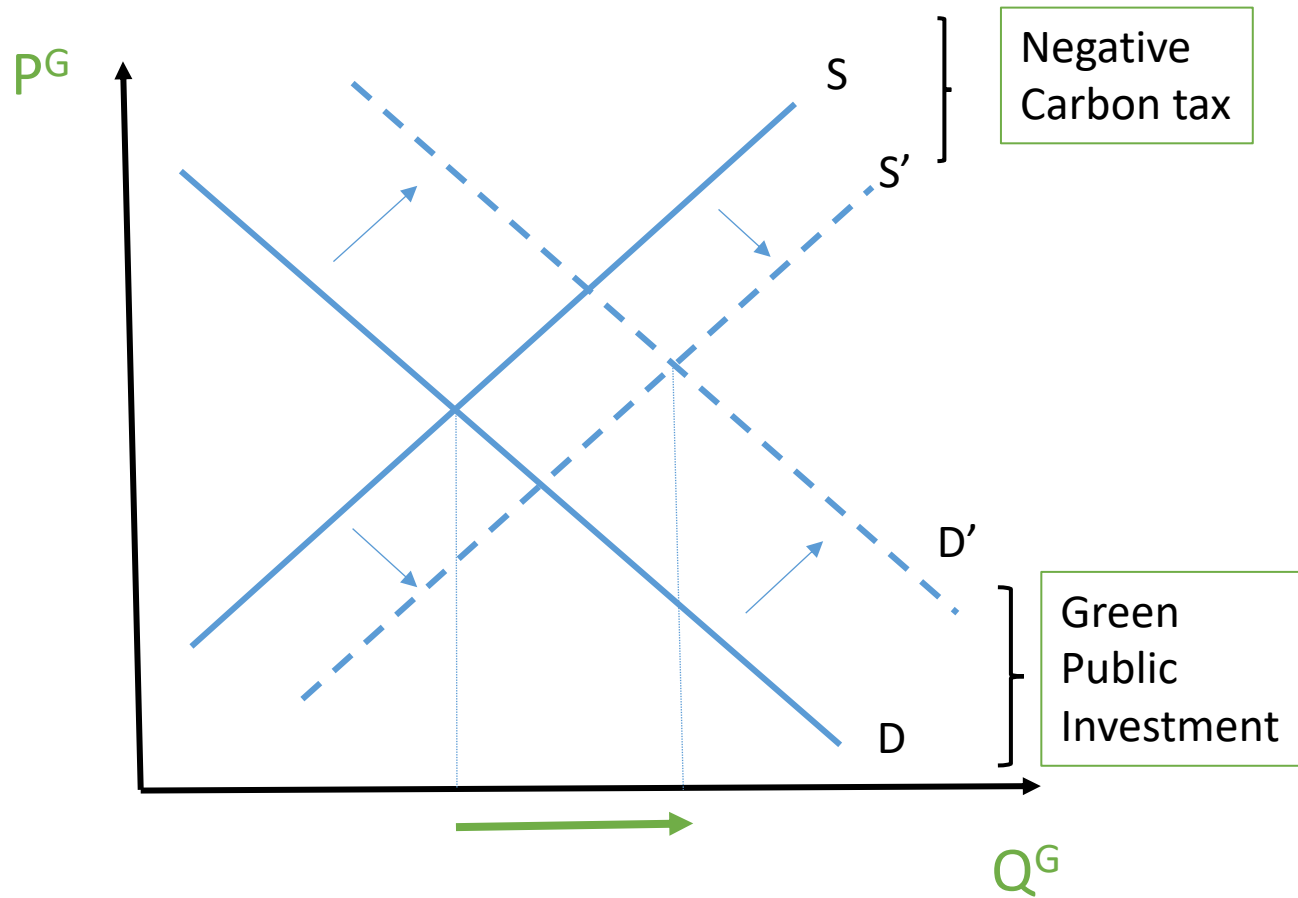
- **Focus on fiscal tools:** carbon pricing, fiscal incentives for private green investments, and public green investment
- **Focus on mitigation:** if adaptation spending is included, results would be reinforced
- **Focus on growth and debt sustainability:** not max welfare
- **Focus on international spillovers:** important for climate-vulnerable countries



High-Emissions Sectors



Low-Emissions Sectors



Main results

- Fiscal instruments (on the supply and demand sides) are complementary and should be deployed jointly
- Carbon pricing alone is too costly a solution
- Green public investment alone would not meet Paris Commitments
- Long term debt sustainability is enhanced with additional public green investment
- Deficit financed public green investments by high-emitting countries (typically advanced and emerging), would have large positive spillovers to other countries, particularly to highly climate sensitive nations

The model: the economic and climate modules

1. Macro multi-country overlapping generations (OLG) model with:

- 8 regions/countries: Europe (Germany, France, Italy), US, China, India e Africa and the rest of the world
- For this paper: advanced countries; emerging countries; low income countries and small economies very exposed to climate shocks

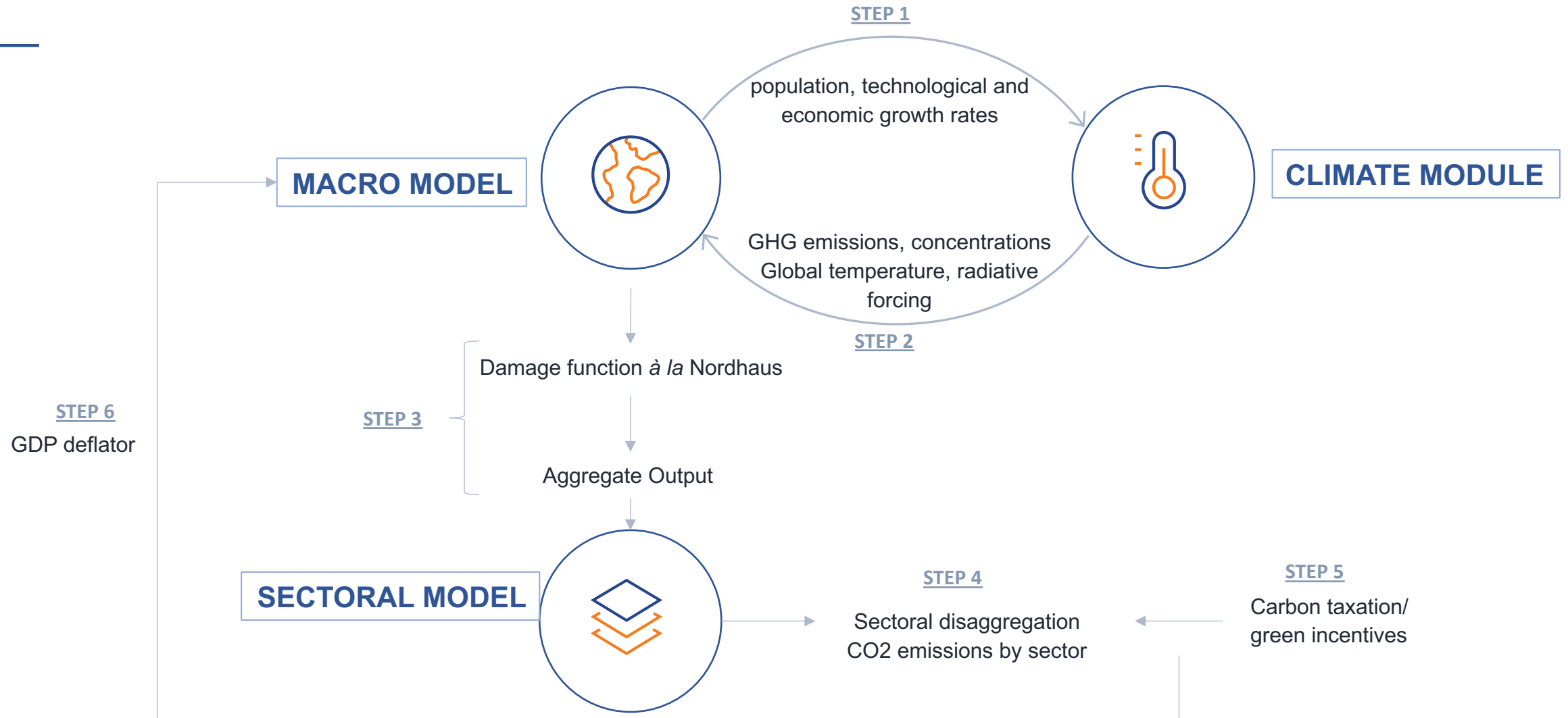
2. Sectoral model with:

- 8 sectors: Brown energy sector, Green energy sector, Negative emissions sector, Heavy manufacturing, Light manufacturing, Crops, Livestock, Services

3. Climate module [FUND, Anthoff et al. (2014)] which computes :

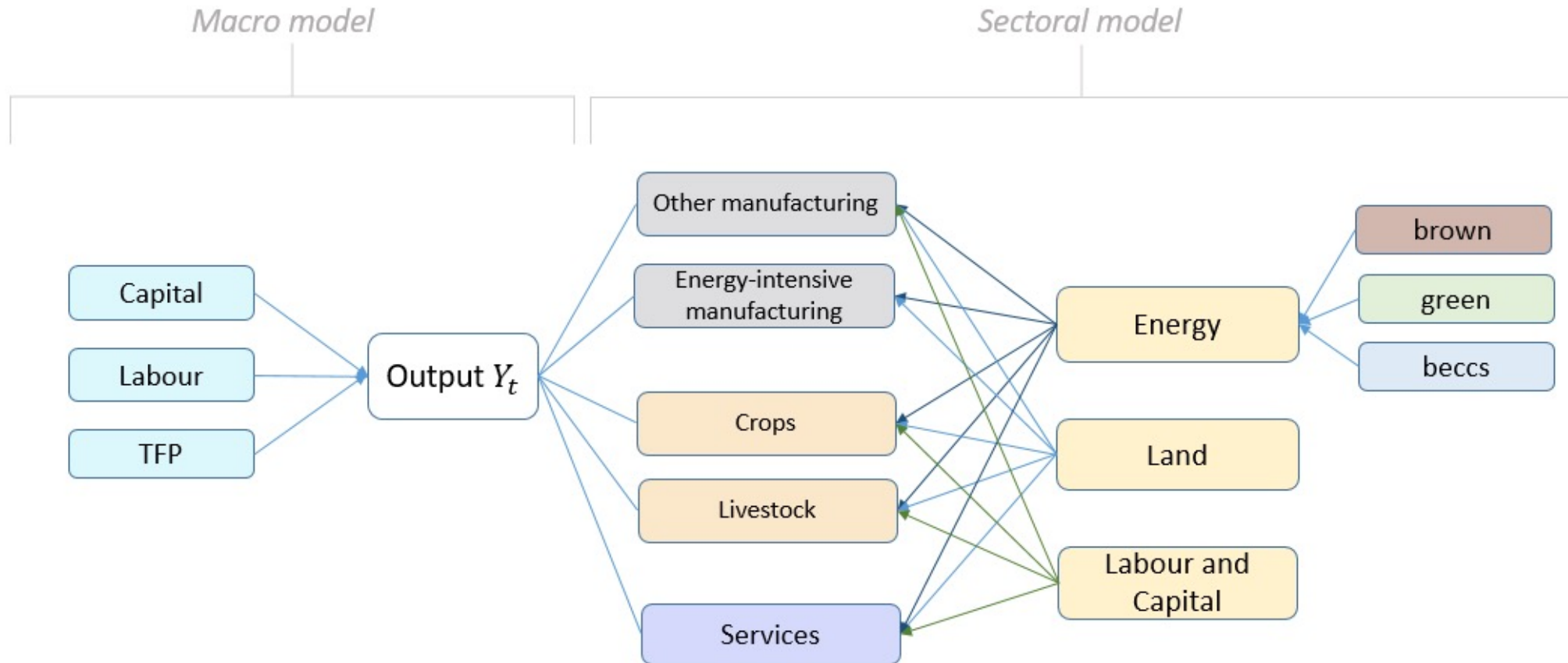
- GHG emissions: CO₂, CH₄, N₂O, SF₆ and SO₂
- Global average temperatures
- Radiative forcing

The model



The model: the sectoral level

A dual system approach: while the macro-model defines output Y_t in terms of aggregate macro-inputs and from a supply side perspective, the CGE model defines the same quantity at the sectoral level taking into account the disaggregated economic structure. General equilibrium conditions are satisfied in each sector matching supply and demand through price determination

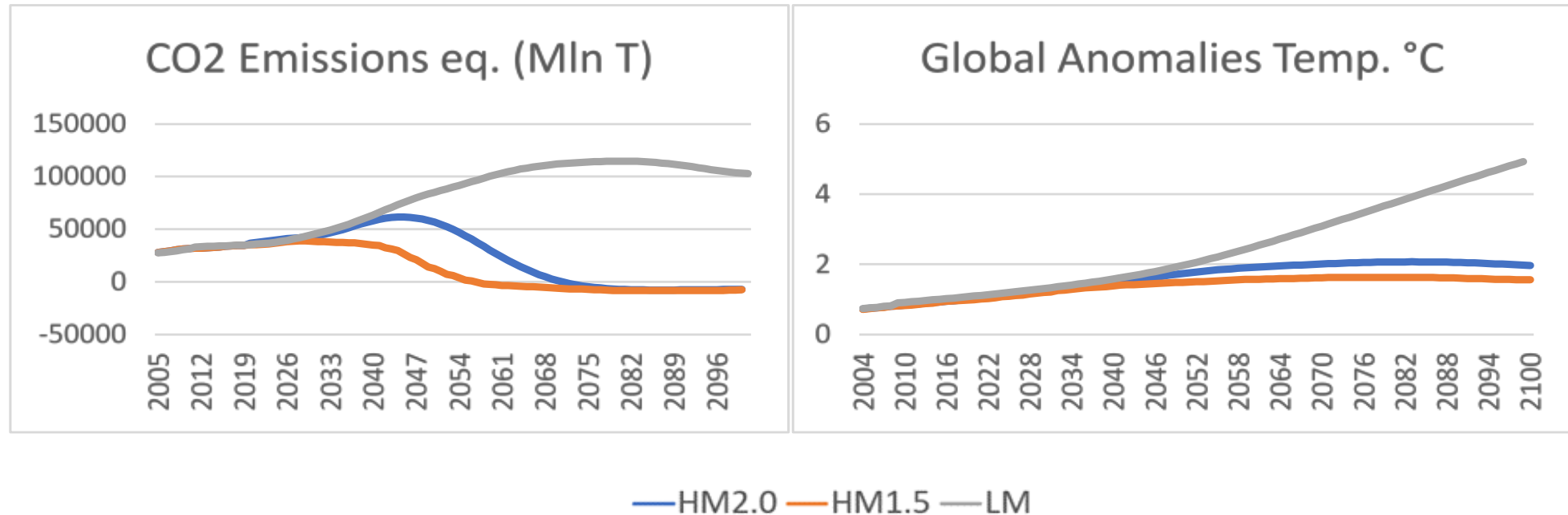


Scenarios

Figure 6 - CO2 Emissions and global temperatures anomalies in different scenarios

a. CO2 Emissions

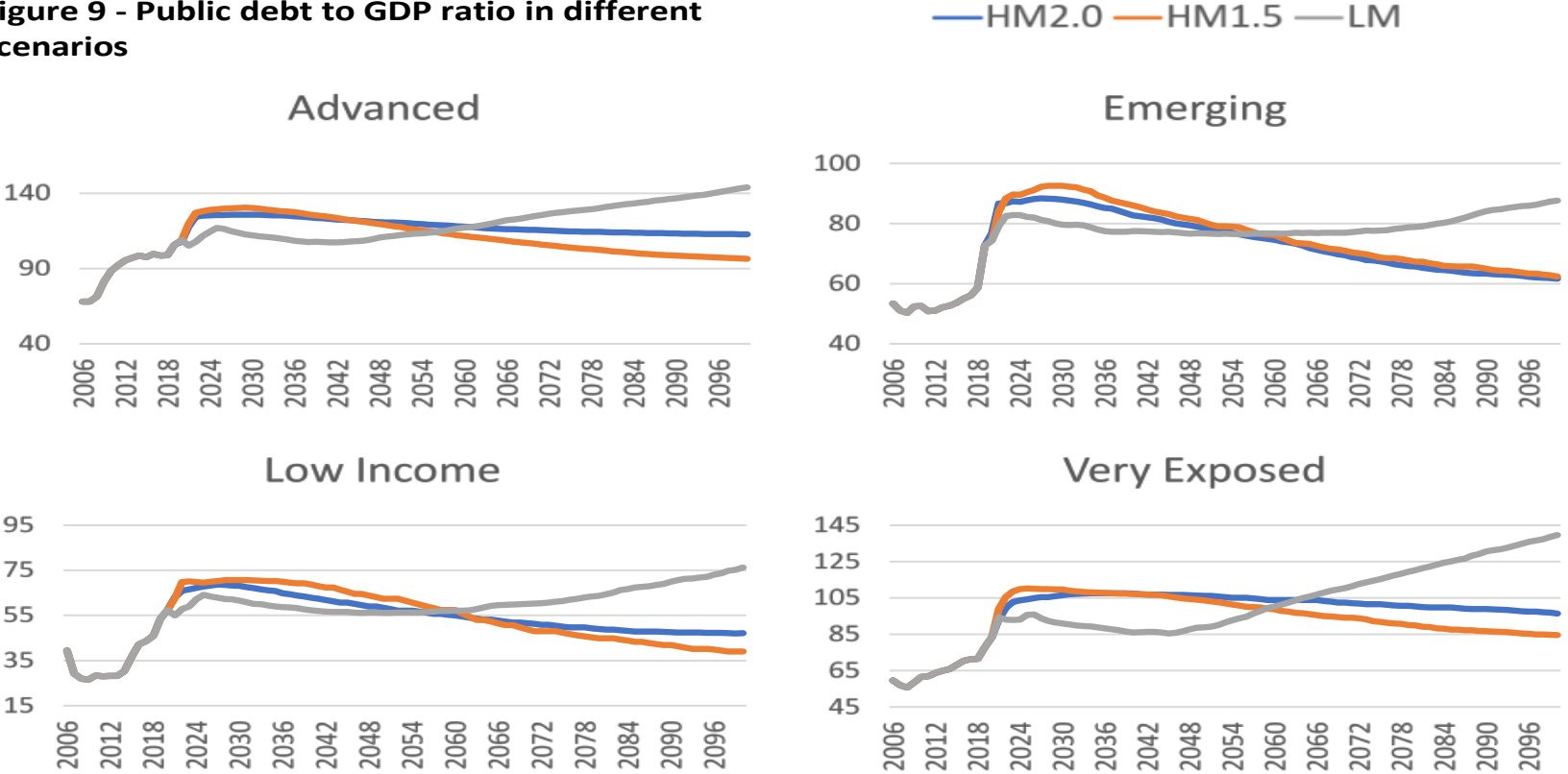
b. Global temperatures anomalies



Note: **HM2**: 2° increase in temperatures, with carbon revenues rebated in green incentives; **HM1.5**: 1.5° increase in temperatures, with carbon revenues rebated in green incentives and all countries increasing green public spending; **LM**: low mitigation scenario

Results: Fiscal instruments are complementary and should be deployed jointly

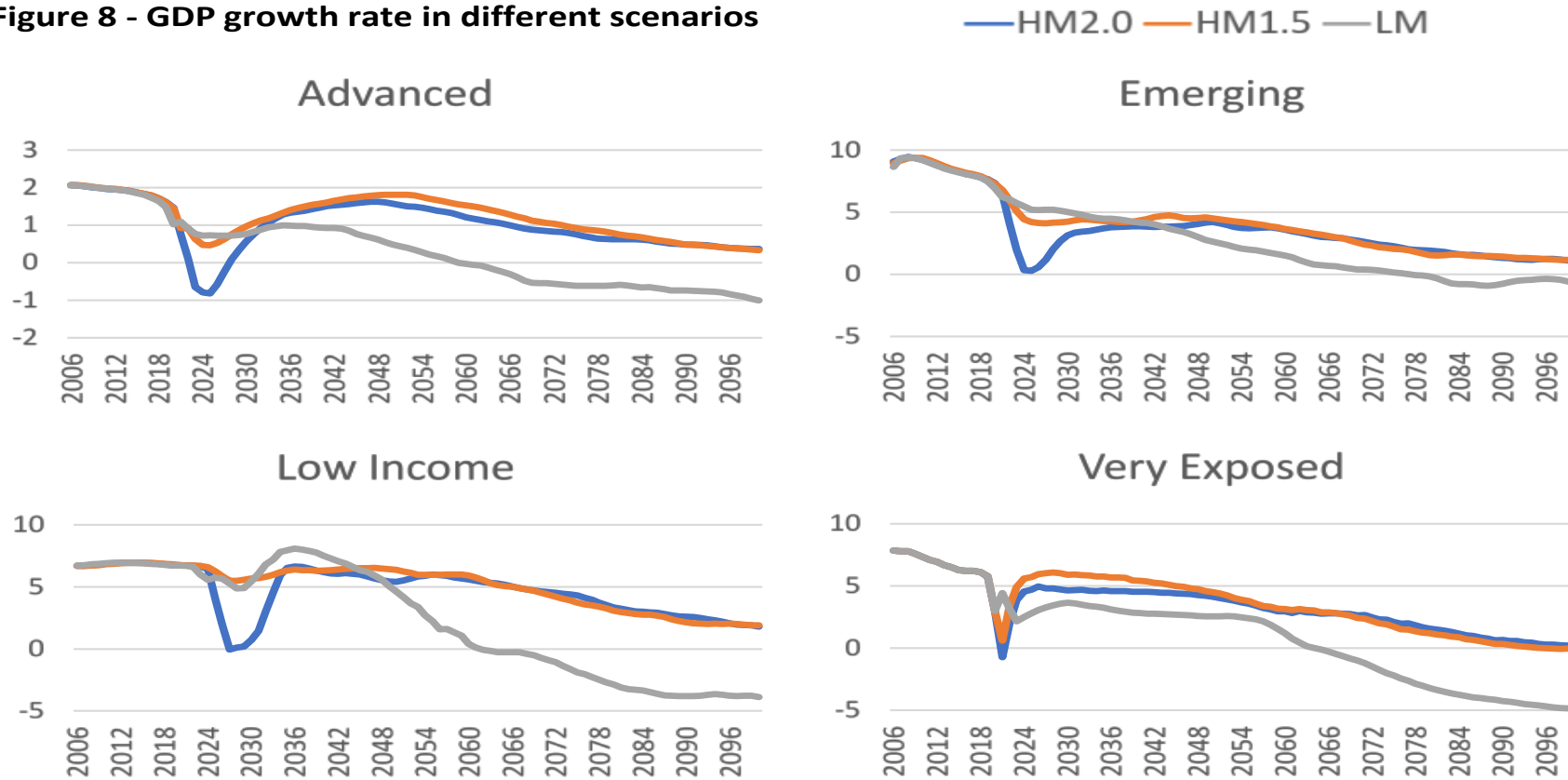
Figure 9 - Public debt to GDP ratio in different scenarios



Note: **HM2**: 2° increase in temperatures, with carbon revenues rebated in green incentives; **HM1.5**: 1.5° increase in temperatures, with carbon revenues rebated in green incentives and all countries increasing green public spending; **LM**: low mitigation scenario

Results: Fiscal instruments are complementary and should be deployed jointly

Figure 8 - GDP growth rate in different scenarios



Note: **HM2**: 2° increase in temperatures, with carbon revenues rebated in green incentives; **HM1.5**: 1.5° increase in temperatures, with carbon revenues rebated in green incentives and all countries increasing green public spending; **LM**: low mitigation scenario

Main findings

- The conclusion from our simulations supports the view that a mix of supply side policies (carbon pricing) and demand side interventions (deficit financed green public investment) is necessary to achieve the Paris goals within the specified period and with a fiscally sustainable outcome.
- Carbon pricing alone would result in rapid and significant energy price increases that would be recessionary.
- Similarly, the level of public green investment needed to reach the Paris goals without recourse to carbon pricing would be so great that it would endanger debt sustainability.
- The paper also assesses the costs associated with transitioning to a low-carbon economy by geographic area. It finds that deficit financed public green investment by high-emitting countries only (typically advanced and emerging), would have positive growth impacts for those countries and enhance their fiscal sustainability, while also providing large positive spillovers to other countries, particularly to highly climate sensitive nations.

Caveats

- Our results depend on (IAM) illustrative simulations: there are large uncertainties on a number of dimensions
- The quantitative results (GDP growth, public debt/GDP, carbon taxes) should be taken with caution...
- ...more trust should be given to the differences across different scenarios

Thanks for your attention!