

Economic models and decision: the Tarpeian rock near the Capitol?

Arx Tarpeia Capitoli Proxima

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(Umr Cnrs, Ehess, Enpc, Engref)

Costs of GHGs stabilization: too good to be true?

Table SPM.4: *Estimated global macro-economic costs in 2030^{a)} for least-cost trajectories towards different long-term stabilization levels.^{b), c)}*

| Stabilization levels (ppm CO ₂ -eq) | Median GDP reduction ^{d)} (%) | Range of GDP reduction ^{d), e)} (%) | Reduction of average annual GDP growth rates ^{d), f)} (percentage points) |
|---|---|---|--|
| 590-710 | 0.2 | -0.6-1.2 | <0.06 |
| 535-590 | 0.6 | 0.2-2.5 | <0.1 |
| 445-535 ^{g)} | not available | <3 | <0.12 |

Table SPM.6: *Estimated global macro-economic costs in 2050 relative to the baseline for least-cost trajectories towards different long-term stabilization targets^{a)} [3.3, 13.3]*

| Stabilization levels (ppm CO ₂ -eq) | Median GDP reduction ^{b)} (%) | Range of GDP reduction ^{b), c)} (%) | Reduction of average annual GDP growth rates ^{b), d)} (percentage points) |
|---|---|---|--|
| 590-710 | 0.5 | -1 - 2 | <0.05 |
| 535-590 | 1.3 | slightly negative - 4 | <0.1 |
| 445-535 ^{e)} | not available | <5.5 | <0.12 |

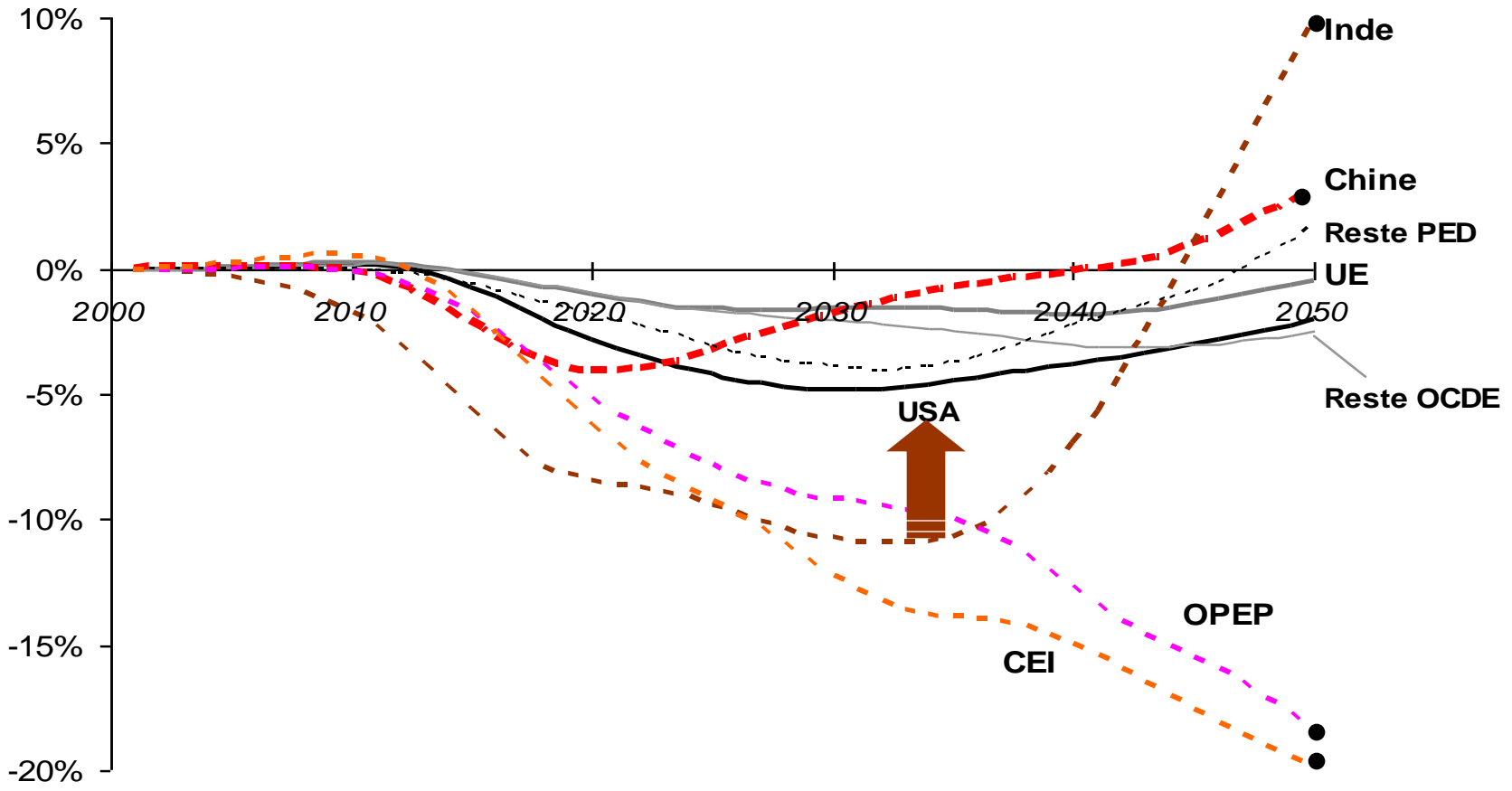
A conversation about three questions

- **Mis-interpretations of cost assessments?**
- **Mind the transitions?**
- **Enlarging the range of policy variables: carbon prices and beyond?**

What mis-understandings about cost formation?

- *‘Most models use a global **least cost approach** to mitigation portfolios and with universal emissions trading, assuming **transparent markets, no transaction cost**, and thus **perfect implementation** of mitigation measures throughout the 21st century’ (Ippcc AR4 WGIII SPM Box 3)*
- **General Equilibrium** analysis based on a growth model which provides “a systematic way to talk about and **compare equilibrium paths** for the economy. In doing so however, it failed to come to grips adequately with the right way to deal with deviations from equilibrium growth “ (Solow 1988)
- **Perfect expectations**, underestimation of the interplay between **uncertainty** and **inertia** in technical systems and institutions
 - **anxiety of decision-makers and freezing of investment decisions**
 - **risks of technological lock-ins and « underdevelopment traps? »**

Mind the transitions!

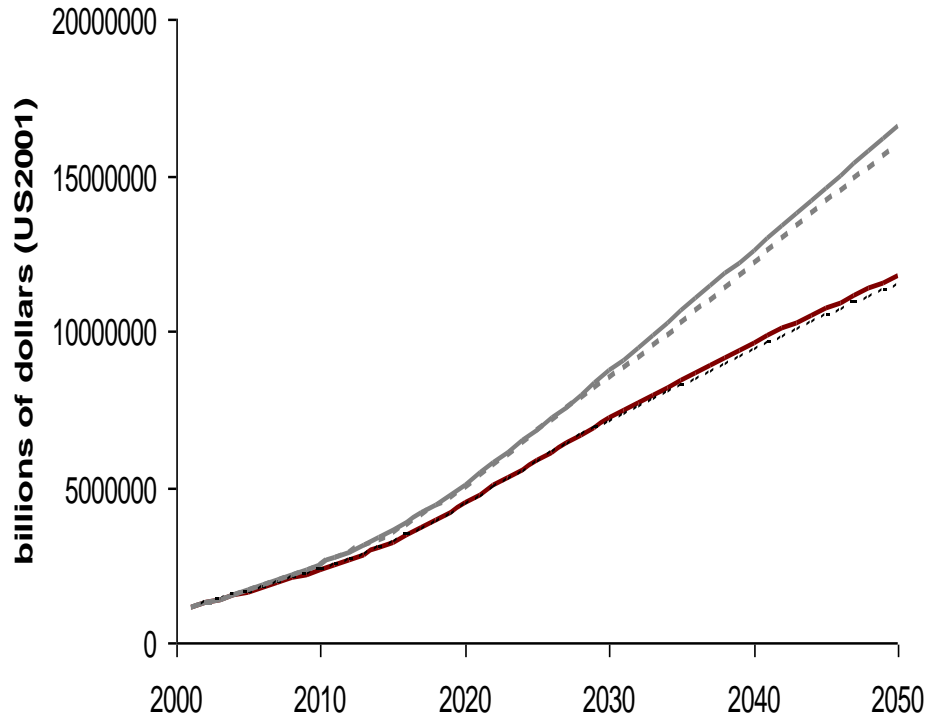


Transition costs: reasons for modest policies?

- **The drivers of transition costs :**
 - **Propagation effects between systems with different characteristic times**
 - **Political constraints to compensation and redistribution**
 - **Heterogeneity of industrial dynamics**
 - **The « misperception» of general equilibrium effects**
- **Matter even more for adaptation** to climate change impacts, thus magnifying ultimate damages
- **Matter also for reference scenarios** thus diversifying the leverages for double – dividend and win-win policies, and all the more so as developing countries are considered

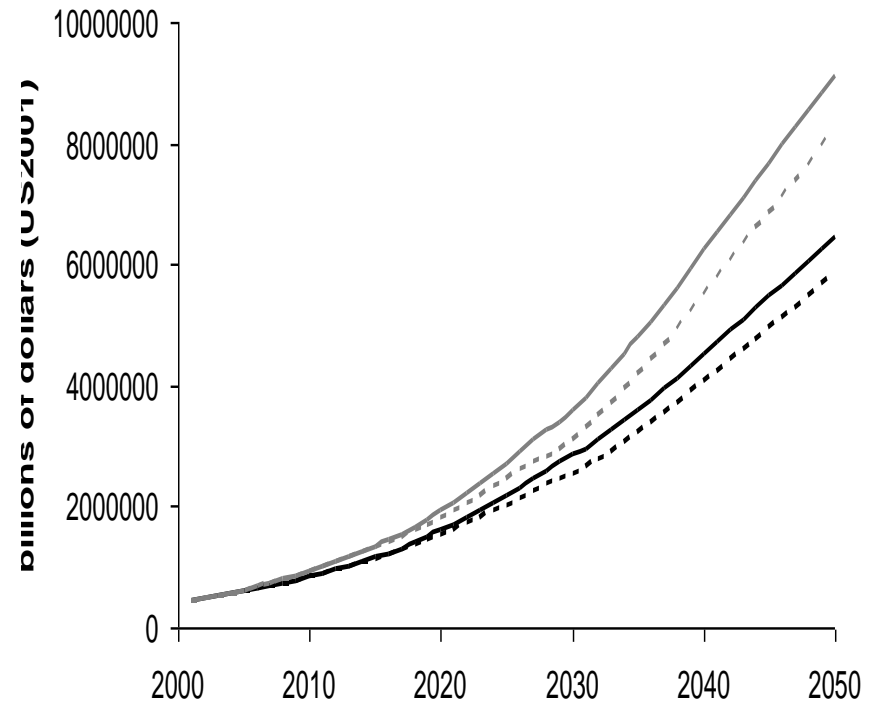
'Negotiated' growth baselines L&H, w/o & with frictions

Real GDP - China



— Low Growth — High Growth
..... Low Growth + energy frictions - - - High Growth + energy frictions

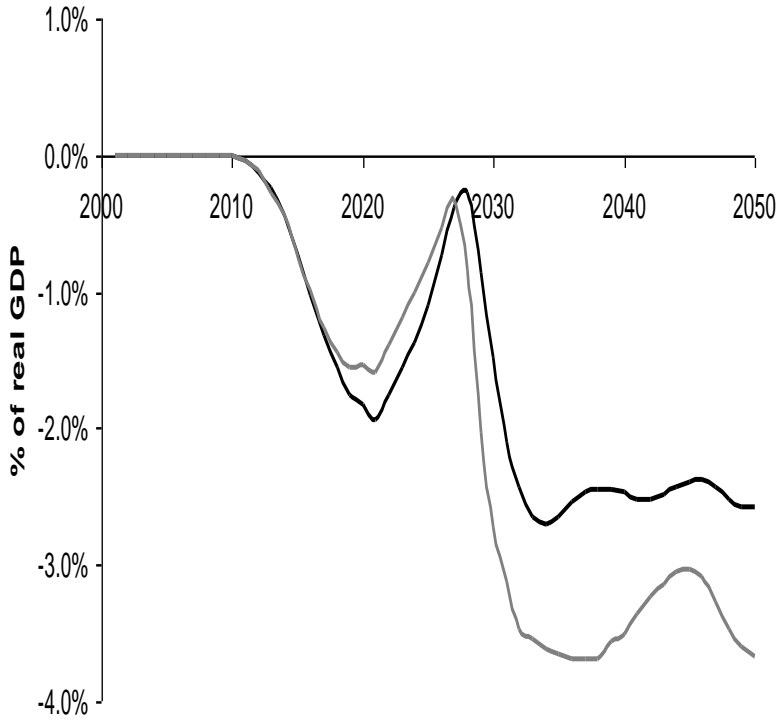
Real GDP - India



— Low Growth — High Growth
..... Low Growth + energy frictions - - - High Growth + energy frictions

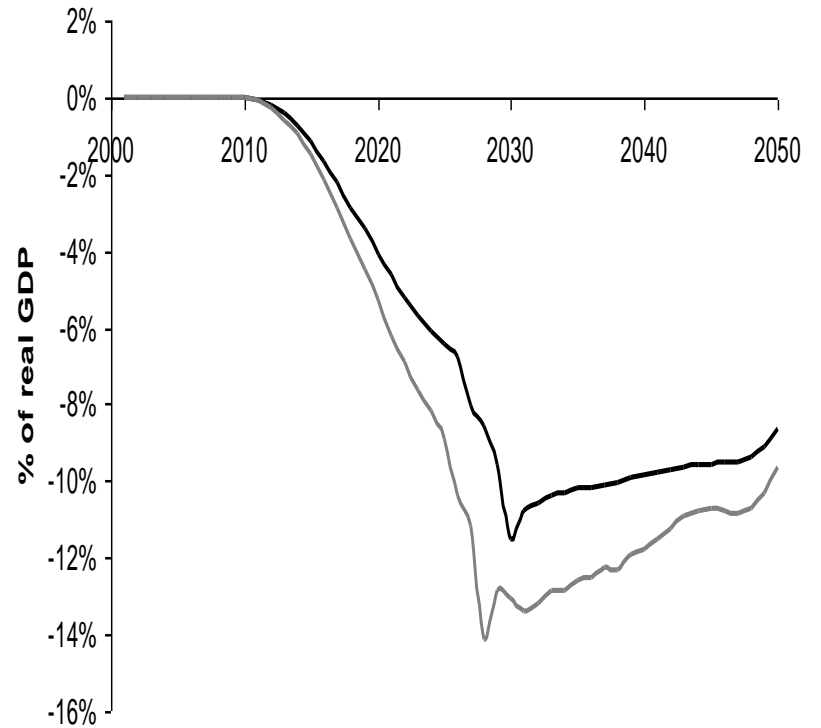
Nothing like a balanced reference pathway

Real GDP losses - China



— Low Growth + energy frictions
— High Growth + energy frictions

Real GDP losses - India



— Low Growth + energy frictions
— High Growth + energy frictions

The policy mix : carbon prices and beyond

- Energy a sector **embedded** in the overall development patterns
 - Transportation and **urban dynamics**
 - Agriculture and **land-use dynamics**
 - Industry: from carbon constraints to **dematerialization as an innovation frontier**
- **R&D is not a manna from heaven and carbon prices will not do the job alone**: prices of real estates, land prices, capital costs including risk-premiums, infrastructure policies, norms and standards
- A necessary (and underworked) link with **fiscal (and welfare)** policies, **commercial** policies, **monetary** policies and **development policies**
- What balance between the **flexibility of policy tools** and the « **efficiency effect** » of stabilizing long term expectations?

New agenda and new practices to avoid the Tarpeian Rock

- On a more personal tone