Introduction

Australia determines to abolish carbon tax from July 2014, which has been blamed for high social burdens and low environmental efficiency. This paper attempts to articulate the intersection between two problems related to these two concerns: burden shifting (forward and backward) and carbon leakage (sectoral and regional). Specifically, under different burden shifting mechanisms, this paper decomposes the carbon leakage effect into revenue, consumption and production substitution effects, derives the boundary conditions and influence factors on the sign and magnitude of carbon leakage, and clarifies the economic and environmental efficiency of unilateral climate policies.

Method

• This paper adopts analytical general equilibrium (AGE) model, which is an important complement of CGE model.
• Basic model: two regions (home and rest of world); two sectors (tradable and untradeable); two inputs (labor and carbon).
• Extension models: more sectors; more input factors.
• Relative assumption: small country assumption.
• Relative principle: producer & consumer accounting principle
• An important lemma: The change percentage of Home’s consumption is equal to that of output multiplied by the economic openness degree

Results

• Forward tax burden shifting.

\[
C = \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right) \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right) \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right) \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right)
\]

• Backward tax burden shifting.

\[
C = \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right) \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right) \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right) \left( \frac{y - \delta F \cdot \frac{x}{y}}{y} \right)
\]

Conclusions

1) we construct an analysis mechanism, combing both forward and backward tax burden shifting mechanisms, sectoral and regional carbon leakages. 2) we decompose the change in carbon leakage into three components: revenue effect, consumption substitution effect and production substitution effect. 3) we extend previous conclusions on carbon leakage from close to open economy, and derive some new conclusions.