Looking for a Double Dividend of a Carbon Tax in Argentina: an input-output evaluation

Paula Micaela Achenbach, María Priscila Ramos and Carlos Adrián Romero

IIEP-Baires (UBA-CONICET)
ICABR2020, 21st October 2020.

Table of contents

1. Introduction

2. Methodological Approach

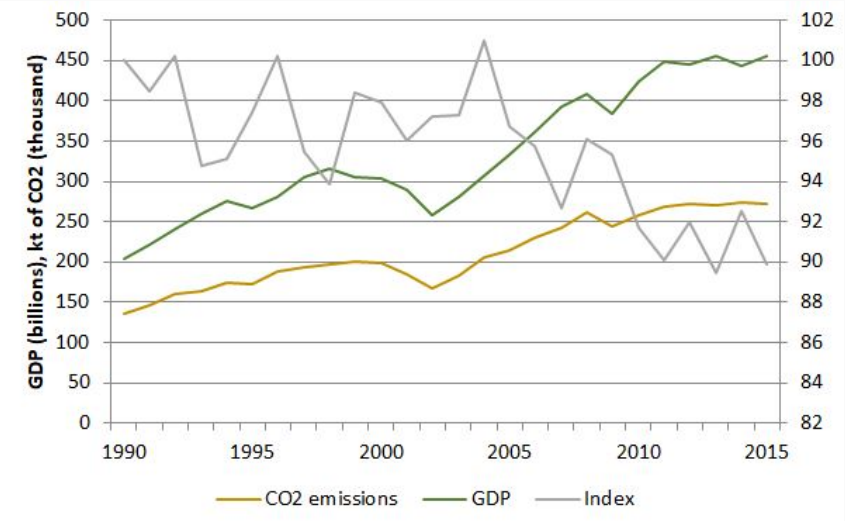
3. Results

4. Conclusions

Introduction

Climate Change in Argentina

- GHG emissions: 368 MtCO2eq in 2017 (0.5% worldwide) which 60% are CO2 emissions.
- GHG emissions per capita higher than world's average

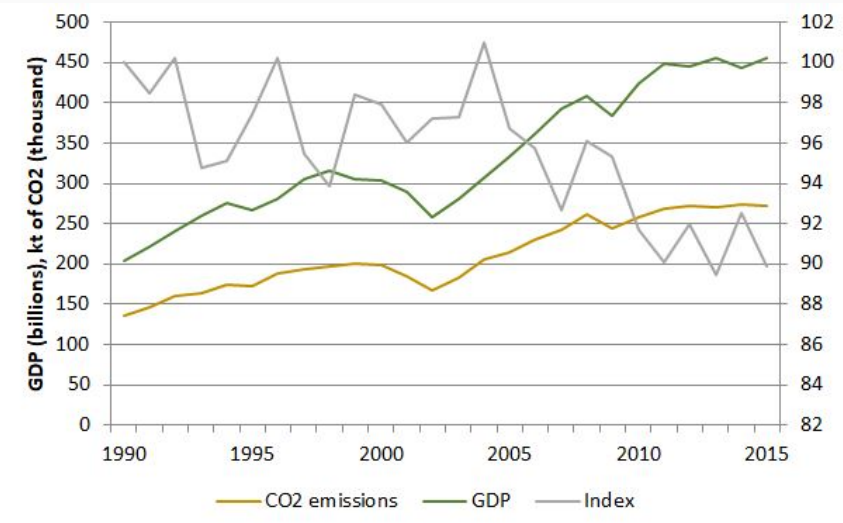


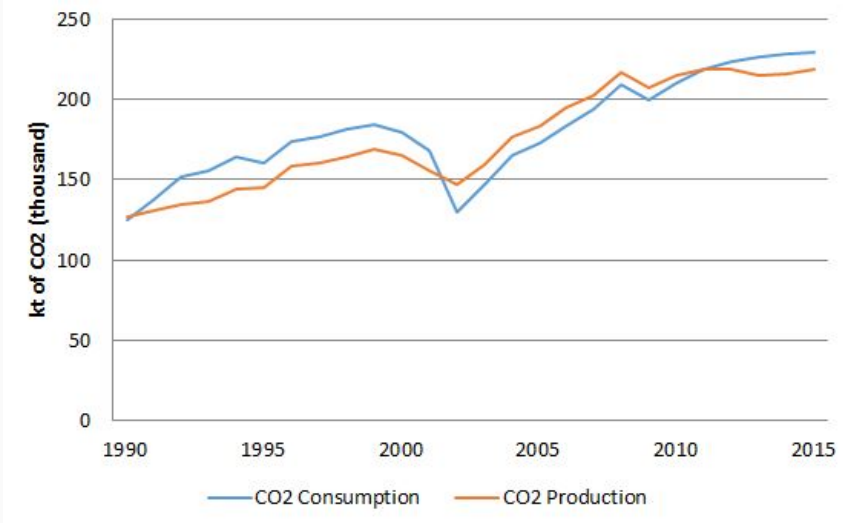
Positive relationship

The index falls, sign of decoupling

Climate Change in Argentina

- GHG emissions: 368 MtCO2eq in 2017 (0.5% worldwide) which 60% are CO2 emissions.
- GHG emissions per capita higher than world's average





Positive relationship

The index falls, sign of decoupling

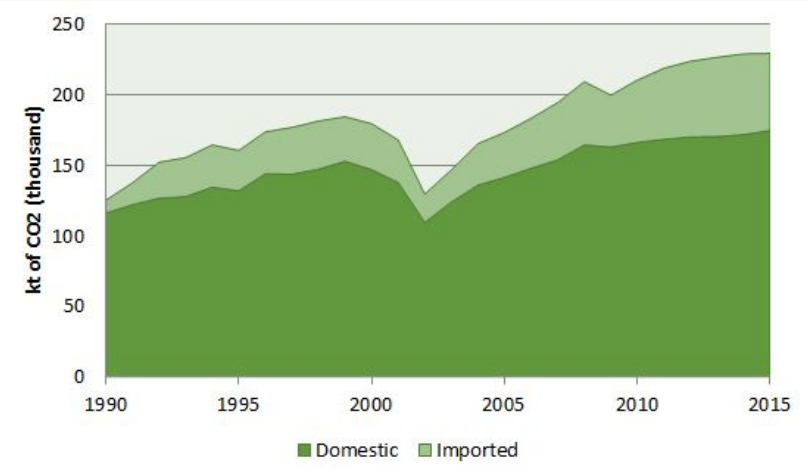
Consumption: local or imported

Production: local or exported.

Similar evolution

CO2 emissions in Argentina

From Consumption



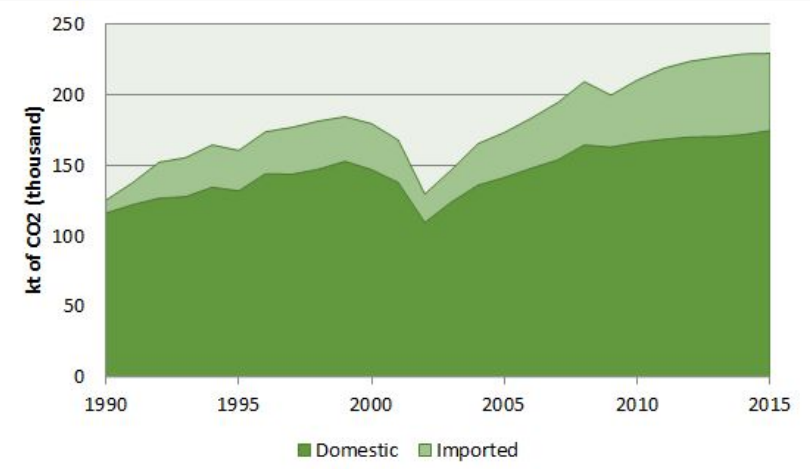
Relevant sectors:

Transport; Electricity,

Gas and Water; Food and Beverage

CO2 emissions in Argentina

From Consumption

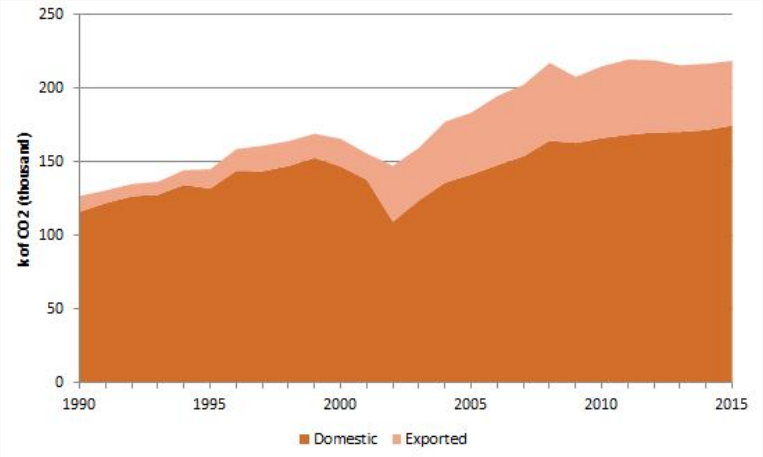


Relevant sectors:

Transport; Electricity,

Gas and Water; Food and Beverage

From Production



Relevant sectors:

Electricity, Gas and Water; Transport;

Petroleum, Chemical and Non-Metallic

Mineral Products

Background

Argentina's Climate Change initiatives

- Reduction of subsidies programs for the energy consumption.
- Policies of zero deforestation
- Laws that establish objectives for the introduction of renewable sources into the electricity consumption matrix
- Projects that promote the use of renewable energies in rural areas

Objectives of this research

1. To analyse the impact of the introduction of a carbon tax in the Argentine economy and

2. To test whether a Double Dividend can exist when the revenue of the tax is inserted back into the economy.

Methodological Approach

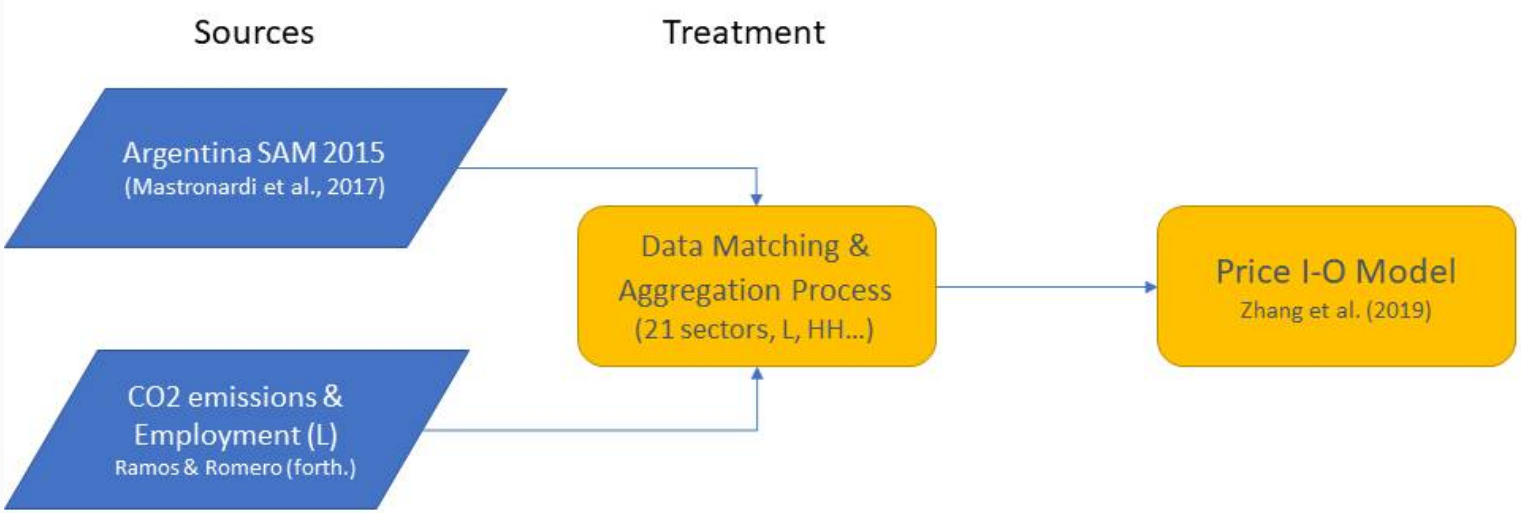
Methodological insights

1. **Input-Output Model**

2. Simulation scenarios

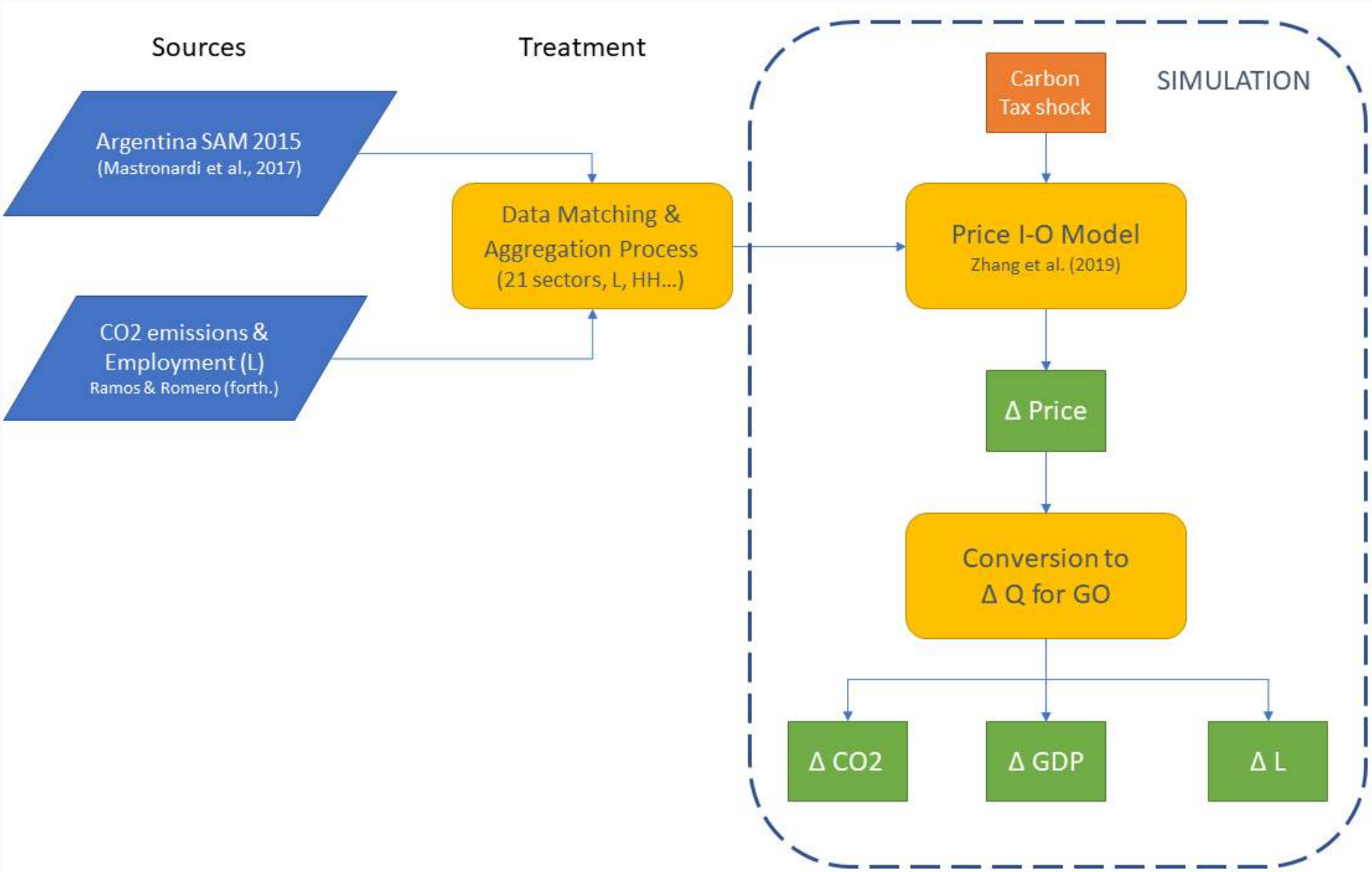
Methodological insights

Input-Output Model

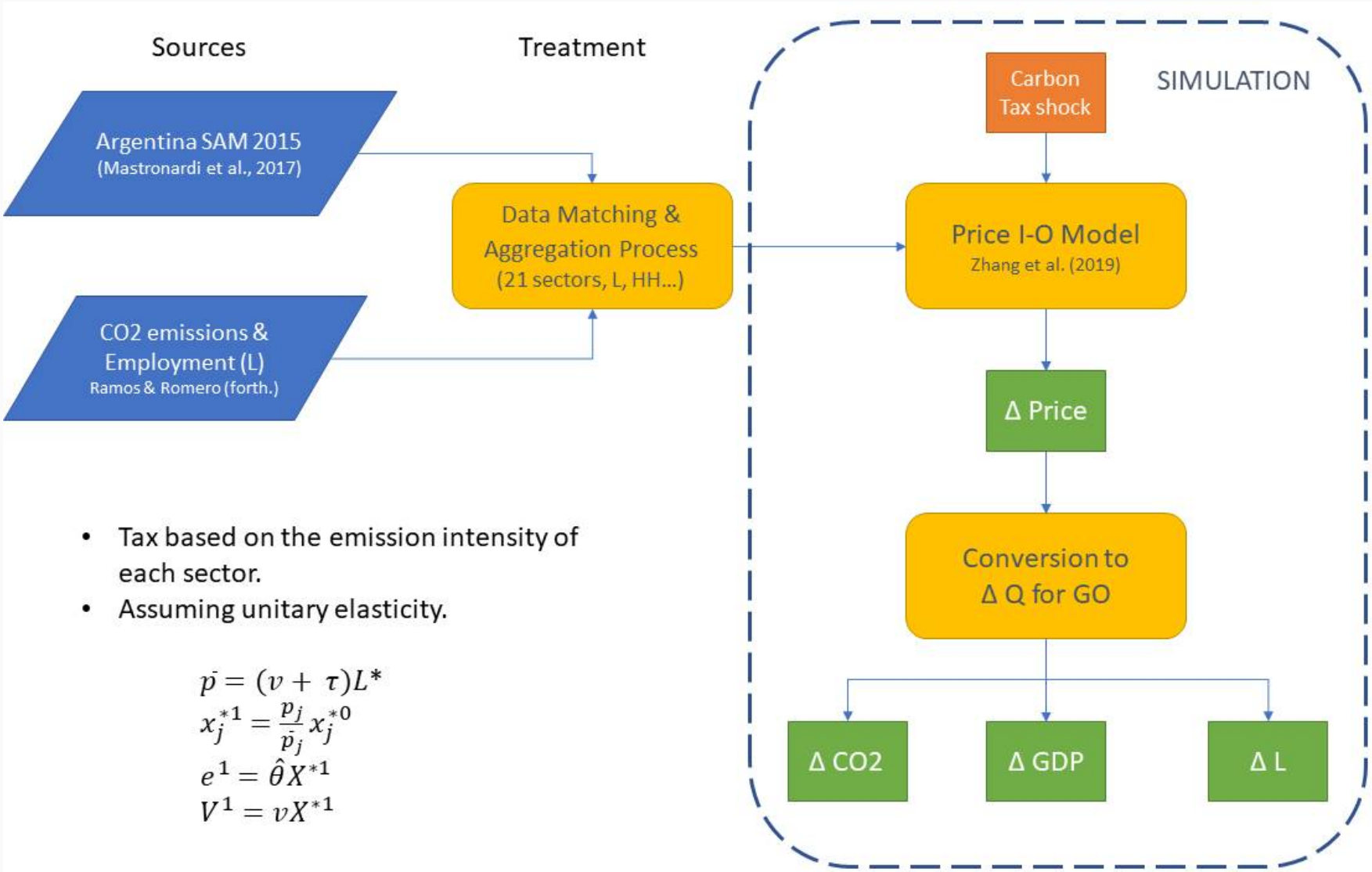


Methodological insights

Input-Output Model



Input-Output Model



- Tax based on the emission intensity of each sector.
- Assuming unitary elasticity.

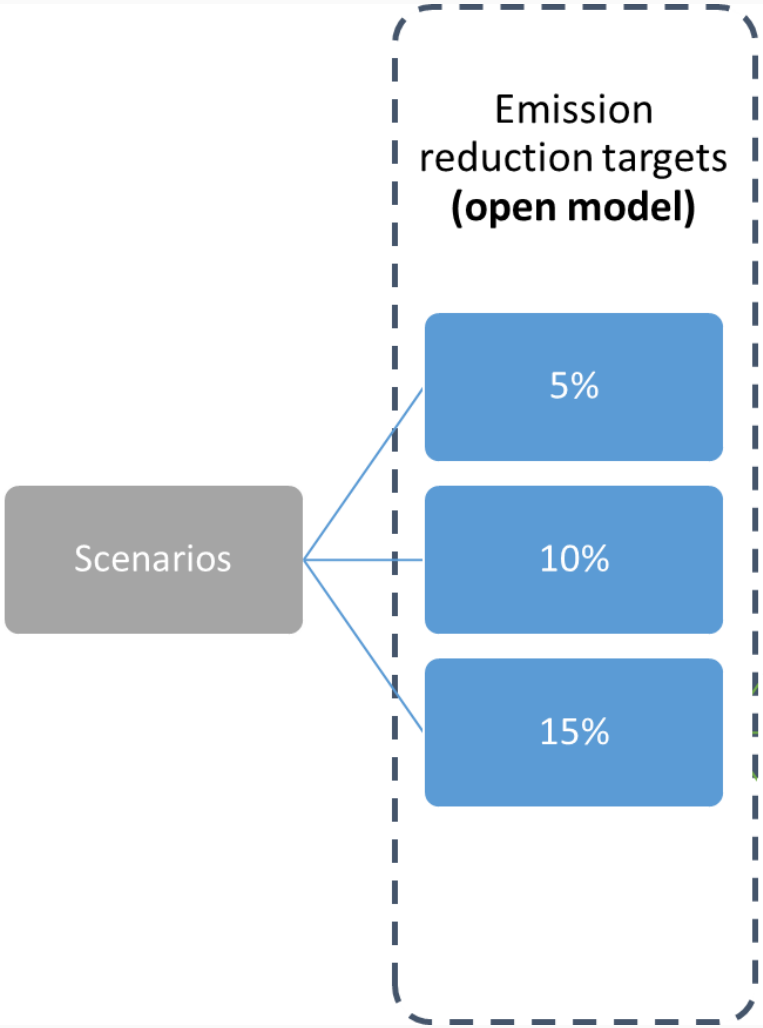
$$\bar{p} = (v + \tau)L^*$$
$$x_j^{*1} = \frac{p_j}{\bar{p}_j} x_j^{*0}$$
$$e^1 = \hat{\theta} X^{*1}$$
$$V^1 = v X^{*1}$$

Methodological insights

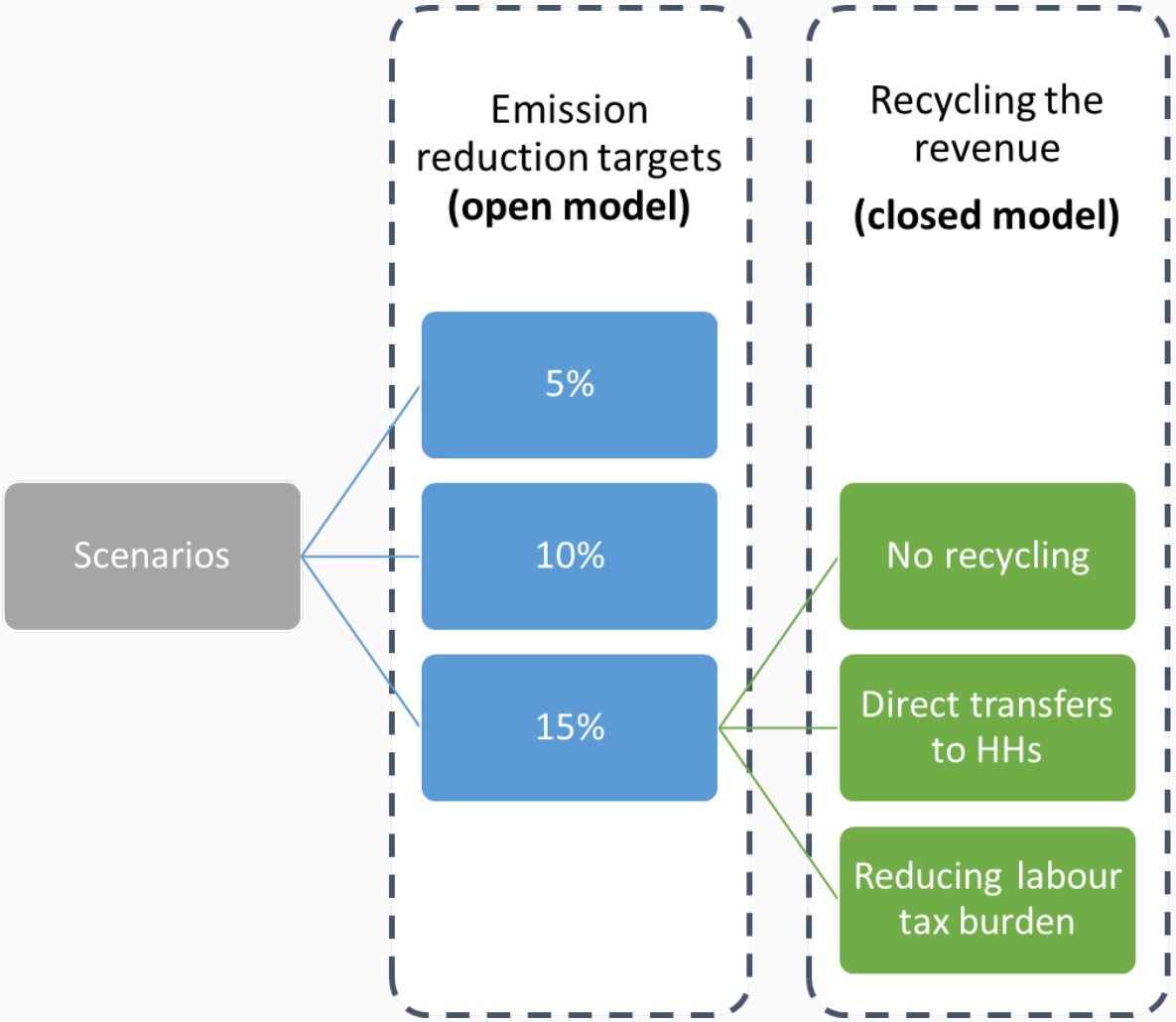
1. Input-Output Model

2. **Simulation scenarios**

Simulation Scenarios



Simulation Scenarios



Results

Carbon Tax and Emissions Targets

Results

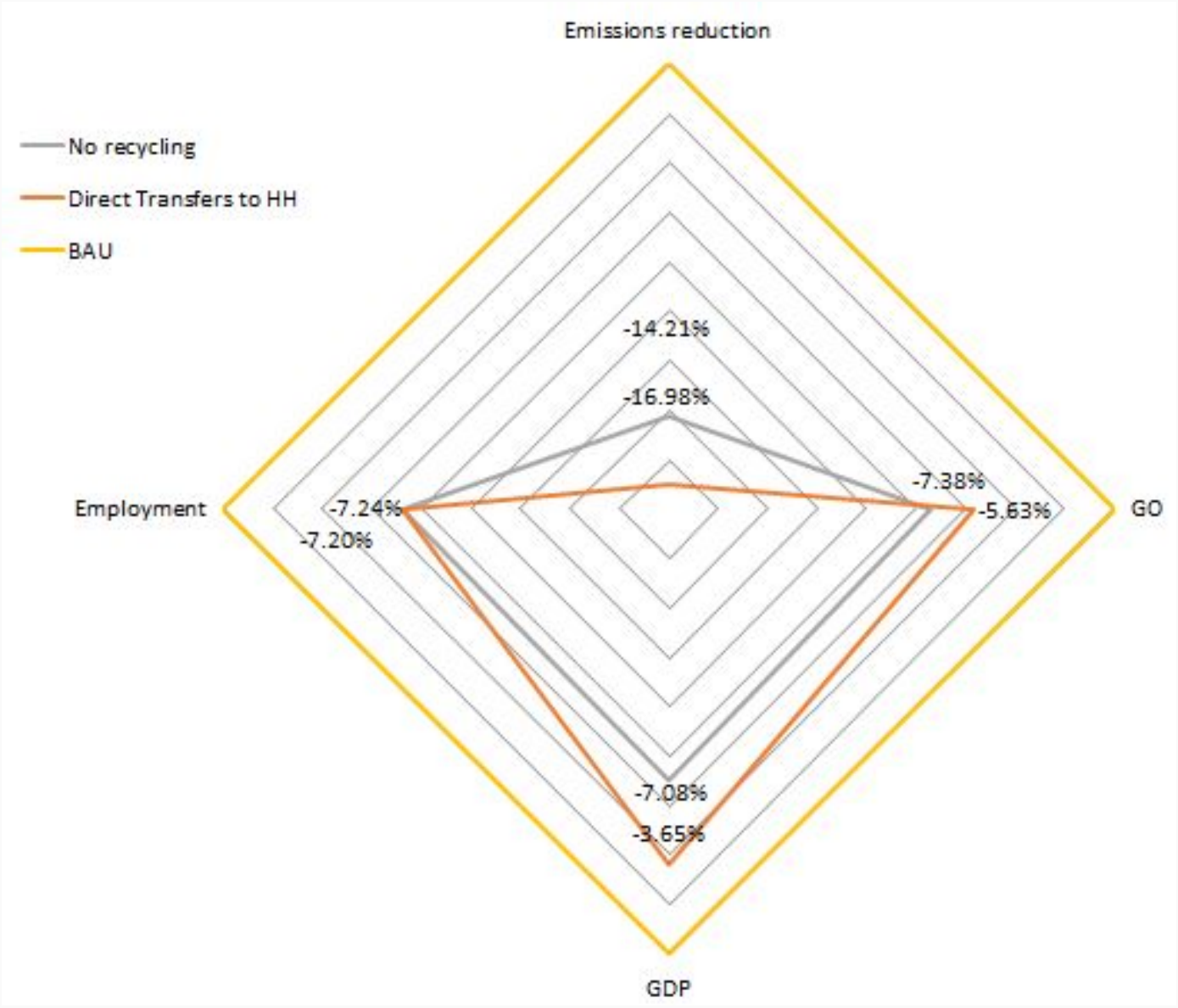
- The introduction of a carbon tax results in a drop in the GDP and GO.
- The higher the value of the tax the bigger the fall on both indicators.

Table 1: Carbon taxes meeting CO2 reduction targets - Open Model

Tax value (per tn)	CO2 Emission reduction	GDP variation
$504	-5%	-1.66%
$1,078	-10%	-3.41%
$1,735	-15%	-5.25%

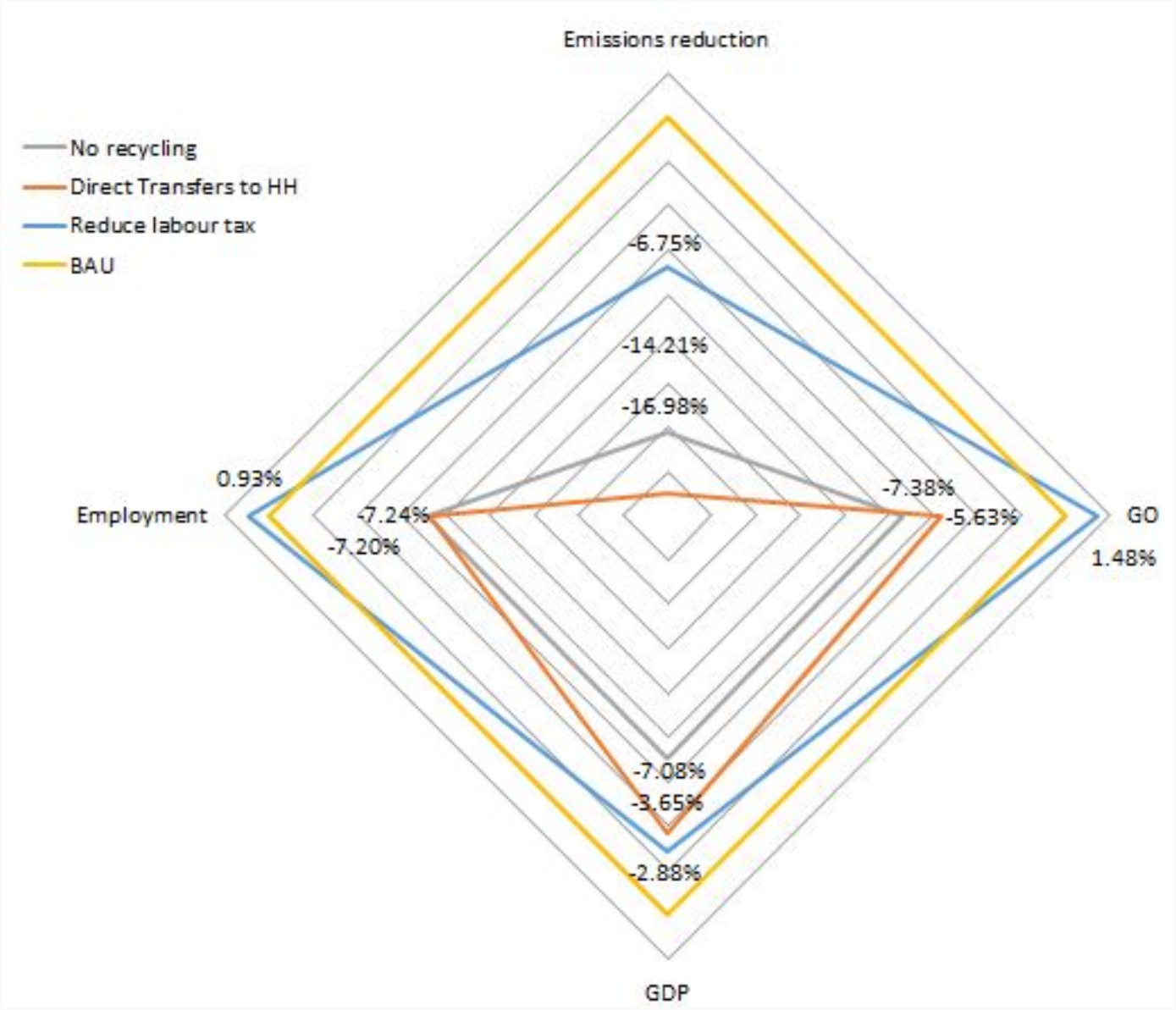
Double Dividend Hypothesis

Carbon tax: AR$ 1,735 / tCO2 - Close model



Double Dividend Hypothesis

Carbon tax: AR$ 1,735 / tCO2 - Close model



Conclusions

Conclusions

Summary

- Analyze the effect on the economy when a carbon tax is included
- Test if a Double Dividend can occur when the revenue is recycled.
- **Results**: a Labor Double Dividend can be achieved.

Conclusions

Summary

- Analyze the effect on the economy when a carbon tax is included
- Test if a Double Dividend can occur when the revenue is recycled.
- **Results**: a Labor Double Dividend can be achieved.

Limitations

- Linearity
- Homogeneous pricing system
- Innovations cannot be predicted
- Argentina as developing country

Conclusions

Summary

- Analyze the effect on the economy when a carbon tax is included
- Test if a Double Dividend can occur when the revenue is recycled.
- **Results**: a Labor Double Dividend can be achieved.

Limitations

- Linearity
- Homogeneous pricing system
- Innovations cannot be predicted
- Argentina as developing country

Future Extensions

- Analysis with a Dynamic I-O Model
- Differentiating the HH account
- Other types of revenue recycling

Thank you for your attention
Questions, comments and suggestions are welcome!