The Double Dividend: Fact or Fallacy?

Andrea Garnero

Master PPD - Paris School of Economics

March 31th 2010
1 Introduction
   - Carbon tax challenges
   - How to use carbon tax resources?
   - The notion of a double dividend

2 Theoretical evidences
   - First approaches
   - More recent approaches

3 Empirical evidences
   - Some calibrations for France
   - Other countries

4 Conclusions
1 Introduction
   - Carbon tax challenges
   - How to use carbon tax resources?
   - The notion of a double dividend

2 Theoretical evidences
   - First approaches
   - More recent approaches

3 Empirical evidences
   - Some calibrations for France
   - Other countries

4 Conclusions
Carbon tax challenges

Contrast between economic development and environment quality?
Contrast between economic development and environment quality?

A carbon tax poses important distributional challenges
- A regressive tax.
- Urban vs. rural households.
- Fuel poors?

How to address these challenges? Through the redistribution of resources levied.
How can resources be used?

- Public budget
- Lump-sum benefit:
  - Everybody the same
  - According to what HHs have payed in carbon tax
- Reduce other distortive taxes
How can resources be used?

- Public budget
- Lump-sum benefit:
  - Everybody the same
  - According to what HHs have payed in carbon tax
- Reduce other distortive taxes

In France the government proposed to redistribute according more or less to what has been payed (rural $>$ urban): 46€ where there are public transport systems, 61€ where are not + 10€ per dependent person.
Room for a **double dividend** reducing other distortive taxes?

**Environmental dividend**: lower emissions, better environment.
Room for a **double dividend** reducing other distortive taxes?

**Environmental dividend** : lower emissions, better environment.

and

**Employment dividend** : lower payroll taxes, higher employment.
Room for a **double dividend** reducing other distortive taxes?

**Environmental dividend** : lower emissions, better environment.

and

**Employment dividend** : lower payroll taxes, higher employment.

**Efficiency dividend** : returning tax revenues through cuts in distortionary taxes leads to cost savings relative to the case where revenues are returned lump sum (Goulder 1995).
Room for a **double dividend** reducing other distortive taxes?

**Environmental dividend** : lower emissions, better environment.

**Employment dividend** : lower payroll taxes, higher employment.

**Efficiency dividend** : returning tax revenues through cuts in distortionary taxes leads to cost savings relative to the case where revenues are returned lump sum (Goulder 1995).

**Distributional dividend** : redistribution of resources to decrease inequalities.
Relative recent debate: years 90s. Two strands:

1. First group of contributions focuses upon the **distortions** of the tax system, before and after an environmental fiscal reform. They ignore distributive equity and focus on the welfare impact. Usually based on a **perfect competition** framework.

2. The second group looks at the impact that **recycled fiscal revenues** can have on relevant macroeconomic variables, especially employment, output, or growth. The contributions in this area usually assume **imperfect competition**.
Introduction

- Carbon tax challenges
- How to use carbon tax resources?
- The notion of a double dividend

Theoretical evidences

- First approaches
- More recent approaches

Empirical evidences

- Some calibrations for France
- Other countries

Conclusions
The notion of a weak double dividend (reducing distorting tax \(\leadsto\) lump sum redistribution) is not controversial.
The notion of a weak double dividend (reducing distorting tax > lump sum redistribution) is not controversial.

More controversial the strong form (a revenue-neutral substitution of a green tax for typical or representative distortionary taxes produces zero or negative welfare gross costs).
From an initial skepticism...

Bovenberg and de Mooij (1994) build a static general equilibrium model and find no welfare gross benefits:

- The purchase power does not change: there is just a shift from taxes on labor to consumption taxes.
- A carbon tax may even reduce employment. A reduction in the tax wedge just brings the employment level back.

Elasticities are the key parameters: price elasticities of labor supply (and demand) and substitution elasticities in production between labor, energy, and capital inputs.
...to conditions for a DD.

If some assumptions are relaxed, the double dividend can occur.

- Distortive tax system
- The second dividend should focus on the good or factor most distorted: L in EU, K in USA.

    And especially:

- Imperfect competition: Involuntary unemployment and monopolies or monopsonies.

Now even room for a strong double dividend!
1 Introduction
   • Carbon tax challenges
   • How to use carbon tax resources?
   • The notion of a double dividend

2 Theorical evidences
   • First approaches
   • More recent approaches

3 Empirical evidences
   • Some calibrations for France
   • Other countries

4 Conclusions
The Double Dividend: Fact or Fallacy?
In France calibrations made by the DGTPF for the *Rapport Rocard* (MESANGE and EGEE) and CIRED (IMAACLIM-S): different assumptions, difficult to compare.
France

In France calibrations made by the DGTEP for the *Rapport Rocard* (MESANGE and EGEE) and CIRED (IMACLIM-S): different assumptions, difficult to compare.

**Table:** Impact on GDP of a carbon tax of 9 Billions €($\sim$72€/ton).

<table>
<thead>
<tr>
<th></th>
<th>MESANGE</th>
<th>EGEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of all taxes</td>
<td>+0.4%</td>
<td>+0.2%</td>
</tr>
<tr>
<td>1/2 HHs, 1/2 firms</td>
<td>+0.5%</td>
<td>+0.2%</td>
</tr>
<tr>
<td>Payroll taxes</td>
<td>+0.5%</td>
<td>+0.3%</td>
</tr>
<tr>
<td>Firms</td>
<td>+0.6%</td>
<td>+0.3%</td>
</tr>
</tbody>
</table>

Source: DGTEP

Andrea Garnero  Master PPD - Paris School of Economics

The Double Dividend: Fact or Fallacy?
**Table:** Impact on GDP of a carbon tax of 400€/ton.

<table>
<thead>
<tr>
<th></th>
<th>Payroll</th>
<th>VAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
</tr>
<tr>
<td>GDP</td>
<td>+2.1%</td>
<td>+1.2%</td>
</tr>
<tr>
<td>Empl</td>
<td>+4.1%</td>
<td>+3.1%</td>
</tr>
</tbody>
</table>

Source: CIRED

**Note:** (1) = constant debt/gdp ratio; (2) = constant tax/gdp ratio; (3) = all other taxes being equal.
Other countries

In general negative evidences of a strong version:

- In US DRI and LINK macroeconometrics models find negative welfare impact.
- GEM in US: carbon tax of 25$/ton $\Rightarrow$ -0.48% if cut on corporate tax, -0.53% if cut in personal taxes.
- GEM in EU: DD just in the short run (Carraro et al. JPE 1996).
Other countries

In general negative evidences of a strong version:

- In US DRI and LINK macroeconometrics models find negative welfare impact.

- GEM in US: carbon tax of 25$/ton ⇒ -0.48% if cut on corporate tax, -0.53% if cut in personal taxes.

- GEM in EU: DD just in the short run (Carraro et al. JPE 1996).

But consensus on a weak form of DD: compensating for a green tax with cuts in distortionary taxation is in any case less costly than compensating for it via lump-sum transfers.
Conclusions

Not strong evidences... but a strong political tool?

- Weak DD: already something.
- Easier to accept: carbon tax in a wider reform of fiscal system.
- Issues of justice and efficiency enter the debate, not only issues about uncertainty and risks.