Environmental tax reform and double dividend evidence

M. Ciaschini, R. Pretaroli, F. Severini, C. Socci

Univeristà degli Studi di Macerata
Università Politecnica delle Marche

Ancona, ACT Conference 2010
14.12.2010

With the contribution of the LIFE financial instrument of the European Community

The climate change challenge

Adapting to Climate change in Time

- Kyoto Protocol (1997)
- European Climate Change Programme (ECCP) and **20-20-20 TARGETS:**
  - A reduction in EU greenhouse gas (GHG) emissions of at least 20% below 1990 levels,
  - 20% of EU energy consumption to come from renewable resources,
  - A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.
- EU Member States Commitment
  - **ITALY: reduction in GHG of 6,5% in the period 2008-2012**

The environmental policy and the proper instruments

- Environmental policy objectives:
  - **discourage polluting activities**
  - **internalize external costs**
  - **not neglect the economic growth.**

- Environmental policy instruments (Parry, 2002):
  - Command-and-control regulations
  - Market-based polices

Environmental taxation

- It is commonly known that:
  - **“eco” taxes impose further burdens on economies**
  - **“eco” taxes may have distortional effects on consumption**

BUT

- The possibility to **collect revenue** from environmental taxation makes this kind of environmental policy powerful.

Double Dividend hypothesis

- *First GREEN dividend*
  - Environmental quality improvement
- *Second BLUE dividend*
  - Economic welfare improvement
  - An employment benefit

Double Dividend hypothesis

- Double dividend effect varies across the regions and may not arise in all the regions where the environmental fiscal reform is implemented (Takeda, 2007).

- This work aims to demonstrate the existence of a regional double (triple) dividend for the Italian Economy when the Central Government adopts a specific environmental fiscal reform.

Environmental Tax Reform proposal

- Environmental taxation on all outputs
- The fiscal burden is differentiated according to CO_2 emissions by each commodity
- The taxation has a progressive and proportional setting
- NO-TAX area
- The tax revenue is completely recycled in the economy
  - **To reduce Households Income Taxes**
  - **To reduce the Regional Tax on Economic Activities**

The methodology

- The Bi-regional Social Accounting Matrix (SAM)
  - North-Centre/South Italy, 2003
- The Environmental data set concerning GHG emissions in physical terms
  - National Accounting Matrix with Environmental Accounts (NAMEA, 2003)
- The Computable General Equilibrium Model (CGE)
  - Severini-Pretaroli model (2009)

The simulations

Adapting to Climate change in Time

- *Simulation 1* – S_1

  The revenue is used by the Central Government to reduce Households Income Tax

- *Simulation 2* – S_2

  The revenue is used by the Regional Government to reduce the Regional Tax on Economic Activities

The results

Adapting to Climate change in Time

Impacts on CO_2 emissions (% change)

Regions	Simulation 1	Simulation 2
South	-1.145	-1.150
North-Centre	-0.805	-0.805
Total Italy	**-0.898**	**-0.900**

The first dividend is achieved in both two scenarios and for each region

The results

Adapting to Climate change in Time

Impacts on primary factors payments and unemployment (% change)

Primary Factors	South		North-Centre	
	s1	s2	s1	s2
Employed	0.043	0.025	-0.075	-0.040
Self Employed	-0.087	-0.069	-0.201	-0.156
Capital	-0.458	-0.437	-0.486	-0.439
Unemployment rate %change	**0.111**	**0.093**	**-0.059**	**-0.028**
Unemployment rate	17.75	17.68	4.60	4.56

Second "employment" dividend arises in both scenarios but only in North-Centre region

The results

Adapting to Climate change in Time

Impacts on Private Real Disposable Income (% change)

Institutional sectors	South		North-Centre	
	s1	s2	s1	s2
Households	-0.009	-0.400	**0.149**	-0.306
Firms	-0.556	-0.527	-0.538	-0.495

A further benefit, the “third dividend” is observed on North-Centre households real income when the policy maker uses the tax revenue to reduce income tax

- The environmental tax reform suggested generates:
  - A reduction in total output
  - An increase in output prices

at the same time, the tax revenue recycling process allows

  - A reduction in CO_2 emissions *(first dividend)*
  - An increase in employment rate *(second dividend)*
  - An increase in real disposable income *(third dividend).*

act Adapting to Climate change in Time

Adapting to Climate change in Time

Thank you very much for your attention

Environmental tax reform and double dividend evidence

M. Ciaschini, R. Pretaroli, F. Severini, C. Socci

Univeristà degli Studi di Macerata

Università Politecnica delle Marche