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## ENVIRONMENTAL TAX REFORM

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### ABSTRACT

While the exact meaning of environmental tax reform (ETRs) has still not been universally agreed, it is generally taken to involve environmental taxation coupled with consideration, and perhaps reduction, of other taxes and/or consideration of how the revenues should be spent. Seven European countries implemented ETRs between 1990 and 2005, and evaluation of these has shown them to be positive both environmentally and economically. Two objectives of most ETRs have been to reduce labour taxes, to compensate low-income households for extra costs, or both. In scenario analyses, ETRs that reduce labour taxes have been shown to reduce environmental impacts, increase employment, and to have relatively small positive or negative effects on GDP.

Keywords: environmental taxation, tax shift, macroeconomic impacts, greenhouse gas emission reduction

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Environmental taxation (qv) entails the imposition of a tax on a substance, or plausible proxy of a substance, that has a specific negative environmental impact. Environmental tax reform (ETR) involves environmental taxation, but with specific consideration of the use of the revenues from the environmental tax in the context of potential changes to the tax system as a whole.

There is no consensus on what use of the revenues is required for an imposition of environmental taxes to qualify as an ETR. A common understanding is that ETR entails a tax shift, rather than an overall increase in the tax burden, and ETR has been defined explicitly in these terms as “a reform of the national tax system where there is a shift of the burden of taxation from conventional taxes, for example on labour, to environmentally damaging activities, such as resource use or pollution” (EEA, 2006, p.84), i.e. a shift from taxing ‘goods’ to taxing ‘bads’. Where ETR involves the reduction in labour and social security taxes, there has been much speculation that it could result in a double dividend (qv), whereby environmental impacts are reduced and GDP increased through the reduction in labour market distortions arising from labour taxation.

However, the revenues could be used in a number of other ways, including:

- Investments in innovation relating to clean technologies (also called eco-innovation, for example, see EEA, 2012a).
- Compensation for low-income households, to remove any regressive effects from the ETR (for example, see EEA, 2012b).
- Lump-sum returns to households (see, for example, British Columbia, 2021, which operates a sliding scale of lump-sum payments depending on household income).

- Maintenance of the competitiveness of affected industries (this mainly takes the form of giving tax rebates to energy-intensive sectors, sometimes requiring commitments to increase energy efficiency, for example, the UK Climate Change Agreements, see HMG, 2021)

EEA (2006, p.84) distinguishes between ETR and environmental (or ecological) fiscal reform (EFR), which it defines as “a broader approach, which focuses not just on shifting taxes and tax burdens, but also on reforming economically motivated subsidies, some of which are harmful to the environment). However, OECD (2017, p.6) identifies three different approaches that go under the name of EFR. The broadest is “a range of taxation or pricing instruments that can raise revenue, while simultaneously furthering environmental goals”, which says nothing about use of the revenues. Narrower is “a tax shift from labour towards environmental use, supplemented by the reform or removal of environmentally adverse subsidies”, which is close to the EEA’s definition of EFR cited above. In between is “EFR is frequently discussed as a means of bringing about a so called ‘tax shift’ in which a progressive increase in the revenues generated through environmentally related taxes provides a rationale for reducing taxes derived from other sources, such as income, profits and employment, the taxation of which is less desirable”, which closely resembles the EEA definition of ETR.

OECD (2017) itself opts for EFR involving “(a) environmental policy using market-based instruments to reflect the cost of environmental damage in prices faced by polluters and (b) raising public revenue and deploying it in a socially useful way”.

ETR has been most commonly implemented in Europe, and the main tax base involved has been carbon and/or energy. A detailed ex-post evaluation of the seven main ETRs carried out in Europe between 1990 and 2005 (Andersen and Ekins, 2009) concluded that all but one (Slovenia, where the tax reform was very small) had been successful in reducing greenhouse gas emissions by up to 6%, that they had resulted in a small increase in GDP for the countries concerned, over what it would have been without the ETR (Figure 1), and that six of the seven ETR countries had performed slightly better than the nine countries in the then

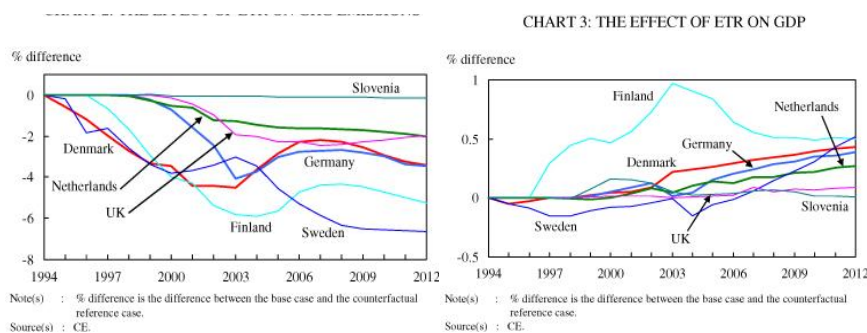


Figure 1: The effect of ETR on seven EU countries in respect of greenhouse gas emissions (left panel) and GDP (right panel)

Source: Andersen & Ekins, 2009, Figures 7.6 and 7.7

An ex-ante assessment of a major ETR in Europe was reported in Ekins & Speck (2011). Four scenarios were modelled using two different kinds of global models, a macro-econometric model (E3ME) and a computable general equilibrium model (GINFORS). The six scenarios were two baselines, one with a low (BL) and one with a high (BH) energy price, and four ETR scenarios, involving both a carbon and a materials tax, and full revenue recycling. The details of the scenarios are set out in Table 1, together with their results in respect of productivity, carbon prices, GDP, employment and inflation.

Scenario	LS1	HS1	HS2	HS3
Energy price	BL	BH	BH	BH
CO2/GHG reduction in 2020 (from 1990 level)	-15%/-20%	-15%/-20%	-15%/-20%	-25%/-30%
Materials tax	15%	15%	15%	15%
Revenue recycling (in different proportions in different scenarios)	Employment and income taxes	Employment and income taxes	Low-carbon investment, employment and income taxes	Employment and income taxes
Other				International cooperation
<b>Impacts</b>				
Productivity* (GINFORS)				
Material	1.97	0.91	0.84	1.78
Labour	-3.02	-0.93	-0.71	-2.61
Carbon	17.17	8.59	8.99	21.35
Carbon prices (Euro 2008)				
E3ME	142	59	53	204
GINFORS	120	68	61	184
GDP*				
E3ME	0.6	0.2	0.8	0.5
GINFORS	-3.0	-0.6	-0.3	-1.9
Employment*				
E3ME	2.2	1.1	1.1	2.7
GINFORS	0.0	0.4	0.4	0.8
Inflation*				
E3ME (price level)	1.6	0.8	0.7	1.8
GINFORS (CPI)	3.0	0.9	1.1	4.1

\* Results are percentage difference from BL in 2020

Table 1: ETR scenarios and their impacts

Source: Ekins & Speck, 2011, Figures extracted from Chapter 9

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The major points of the study's results may be highlighted as follows:

- GHG emissions: the carbon tax was levied at the rates in each scenario necessary to reach the then targets in the EU. The tax rates need to be higher with low oil prices (LS1) or greater emission reduction (HS3). When the HS3 carbon tax is levied globally, global CO<sub>2</sub> emissions are stabilised between 2010-2020 at about 29 billion tonnes CO<sub>2</sub>, whereas in the baseline they reach more than 34 billion tonnes (Ekins & Speck, 2011, Figure 11.7, p.304) (the actual global CO<sub>2</sub> level in 2019, before the pandemic was 33.4 billion tonnes<sup>1</sup>).
- Carbon prices in HS1 and HS2 in 2020 in both models are close to current EU ETS levels. They are higher when oil prices are low (LS1) or the required GHG emission reduction is higher (HS3).
- The macro-economic effects in the scenarios are small:
  - GDP rises above the baseline in one model, and falls in another, with the largest effect being a 3% reduction in GDP in the low oil price scenario, LS1 (GINFORS). However, in all scenarios the effect on GDP growth is small, and throughout the period the European economy continues to grow at around 2.0% or more, compared to the baseline level of 2.2%.
  - Employment rises slightly in both models, by more than GDP in E3ME, so that labour productivity falls in both models.
  - The tax shift is slightly inflationary (a maximum of around 0.3% per year over the period, in LS1 and 0.4% per year in HS3 for the larger GHG reduction (GINFORS))

Clearly the results of a single study are illustrative rather than definitive, but they suggest that ETR could play a useful role in helping European and other countries meet the much more stringent GHG reduction targets implied by the Paris Agreement temperature target, which are now deemed necessary to avoid the worst effects of climate change.

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<sup>1</sup> <https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020>

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