

Energy taxation in a small, open economy: Social efficiency gains versus industrial concerns

Geir H. Bjertnæs¹, Taran Fæhn^{*}

Statistics Norway, Research Department, P.O. 8131 Dep., 0033 Oslo, Norway

Received 25 May 2006; received in revised form 29 May 2007; accepted 24 September 2007

Available online 5 October 2007

Abstract

Welfare analyses of energy taxes typically show that systems with uniform rates perform better than differentiated systems, especially if revenue can be recycled by cutting taxes that are more distortionary. However, in practical policy, efficiency gains must be traded off against industrial concerns. Presumably, energy-dependent industries of small, open economies will suffer relatively more if taxed. This computable general equilibrium (CGE) study examines the social costs of compensating the energy-intensive export industries in Norway for their profit losses from imposing the same electricity tax on all industries. The costs are surprisingly modest. This is explained by the role of the Nordic electricity market, which is still limited enough to respond to national energy tax reforms. Thus, an electricity price reduction partly neutralizes the direct impact of the tax on profits. In addition, we examine the effects of different compensation schemes and find significantly lower compensation costs when the scheme is designed to release productivity gains.

© 2007 Elsevier B.V. All rights reserved.

JEL classification: F41; H21; Q43; Q48

Keywords: Energy taxes; Electricity markets; Competitiveness; Compensation; Computable general equilibrium (CGE) models

1. Introduction

Much of the empirical literature finds that energy tax exemptions and concessions tend to be costly compared with uniform taxation (Böhringer and Rutherford, 1997; Ekins and Speck, 1999; Felder and Schleiniger, 2002; Bye and Nyborg, 2003). This result is reinforced if the fact that the implicit renouncement of tax revenue could be used to cut other, more distortionary taxes is

^{*} Corresponding author. Tel.: +47 21094837; fax: +47 21090040.

E-mail addresses: ghb@ssb.no (G.H. Bjertnæs), tfn@ssb.no (T. Fæhn).

¹ Tel.: +47 21094430; fax: +47 21090040.

accounted for; see contributions in [Goulder et al. \(1997\)](#), [Farrow \(1999\)](#), [Fullerton and Metcalf \(2001\)](#), [Parry et al. \(1999\)](#), and [Bovenberg \(1999\)](#). In spite of these findings, several countries have exempted selected energy-dependent industries from energy taxation. The design of energy tax systems is likely to be affected by political pressure groups; see [Pearce \(2006\)](#) for the case of the UK Climate Change Levy. Hence, a plausible explanation for the exemptions has to be sought in the fact that these industries constitute powerful lobby groups.

The main question posed in this analysis arises from this apparent trade-off between overall efficiency and industrial distribution arguments. We ask whether the welfare potential of equalizing tax rates tends to erode if combined with compensatory transfers to energy-intensive industries. Existing analyses of large economies have found rather small compensation costs. However, there are reasons to expect larger costs, the smaller and the more open is the economy. This study examines the case of compensating the energy-intensive export industries in a small, open economy, Norway. This may be a case for less optimistic conclusions.

The existing studies of large economies include [Bovenberg and Goulder \(2001\)](#), who address uniform CO₂ taxation in the US's case. Their conclusion is that the welfare gain is reduced by only one-tenth if the reform is accompanied by compensation for profit losses in the American energy industry. In addition, [Böhringer and Rutherford \(1997\)](#) find that avoiding layoffs in the German energy industry is less costly when combining a uniform CO₂ tax with wage subsidies to the industry compared with using CO₂ tax exemptions. However, these results rely heavily on the fact that the energy industries are sufficiently large to affect prices in the markets for energy products. In the large industry case, tax changes will affect market prices and most of the CO₂ tax burden will shift onto buyers. Thus, after compensation, significant parts of the revenue remain for cuts in other, distortionary tax wedges. However, the smaller and the more open the country is, the more exposed firms will be to externally given world market prices and conditions, and the smaller will be the scope for shifting tax burdens onto demanders or suppliers through price incidences. This makes the case of the Norwegian energy-intensive export sector different and worth examining.

The sector, which comprises the three industries producing metals, pulp and paper articles, and industrial chemicals, first consumes energy in the form of electricity, of which it accounts for one-third of total consumption. Therefore, this analysis will focus on the electricity tax system. In the present electricity tax system, all manufacturing industries are exempted, whereas final consumers, primary industries, and service industries, including transportation and construction, pay a rate of 1.2 Eurocents/KWh. The current electricity production is mainly based on hydropower, and the two expressed reasons for taxing electricity consumption are to protect the environment (waterfalls and rivers) and to raise public revenue. The environmental arguments will become more relevant in the future, as it is expected that power based on natural gas will become profitable within the next few decades.

Previous analyses indicate that the trade-off issue between efficiency and political feasibility is relevant to Norwegian electricity price policies. In a partial electricity market study, [Bye et al. \(1999\)](#) find that more harmonized electricity prices across users would improve overall consumer and producer surplus but at the expense of the energy-intensive export sector. The sector is important in regional policy considerations because of its peripheral location. Furthermore, the sector is politically influential because aside from the oil and gas sector, it is the largest generator of export revenues, contributing with 15% of the Norwegian total export revenue in 1999. Its high degree of exposure to internationally given product prices makes the sector highly vulnerable to cost changes. In addition, the sector buys their input of power in an electricity market that has undergone major liberalization over the last decade and is now fully integrated into a Nordic market. This has limited the possibilities for cost changes to be passed on in the form of higher electricity prices. As it is

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات