Energy tax refunds and firm competitiveness in Finland's energy intensive industries

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Overview

Attempts to cut back greenhouse gas emissions and reduce energy use have brought along increases in energy taxes or specific carbon prices in many countries. However, carbon pricing have produced concerns that energy intensive industries could suffer a competitive disadvantage in terms of their cost competitiveness relative to countries with laxer environmental policies. There are only few studies on the effect of energy or carbon taxes on the competitiveness of manufacturing firms. Arlinghaus (2015) provides a fairly recent literature review and concludes that carbon taxes or EU emissions trading have had little impact on competitiveness at the firm, sector or country level. According to Arlinghaus, carbon pricing has had some success in reducing firms' energy intensity and carbon emissions, while tax relief to energy-intensive industries has not affected competitiveness indicators in manufacturing.

Firms in Finland's energy-intensive industries are entitled to notable refunds on energy taxes if their tax expenses exceed a threshold connected to their value added. The aim of the energy tax refund system is to enhance the international competitiveness of Finland's energy-intensive export industries, but the refunds may work against the aim of decreasing CO2 emissions and improving energy efficiency via carbon based energy taxes.

This study analyses the effectiveness of the energy tax refund system relative to its competitiveness objective by exploiting changes made in the energy taxation system: 1) the increase in energy taxes in 2011, and 2) the decrease in the energy tax threshold that entitles a firm to a tax refund in 2012. The changes in 2011-2012 significantly increased energy tax refunds and the number of firms receiving energy tax refunds (see Figure 1). We examine the association of energy tax refunds and several measures of firms' competitiveness using firm-level micro databases.

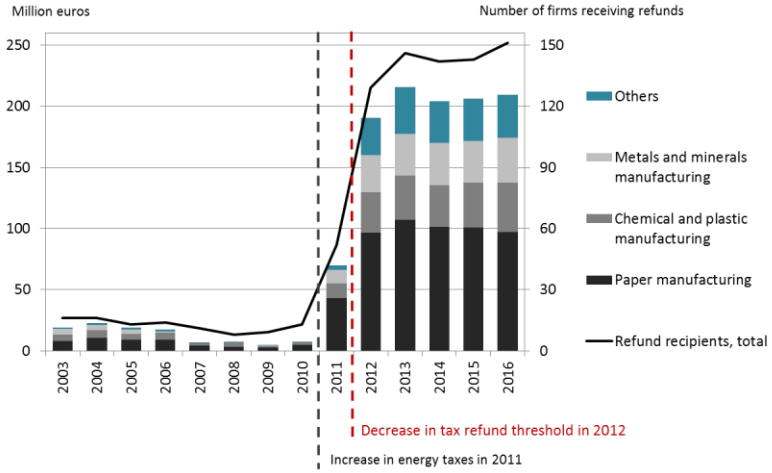

Figure 1. Energy taxes refunded and the number of firms receiving a refund in Finland in 2003-2016

Methods

Our data stem from two main sources. First, the Finnish Customs was the authority collecting energy taxes and granting energy tax refunds up to the end of 2016. Customs provided data on the firms that applied for a tax refund, the energy taxes paid by the firms and their energy use. The Customs data cover years 2010-2014. Second, the Finnish Tax Administration in turn maintains the most extensive Finnish firm-level database that provides information on firms' financial statements, balance sheets, ownership and value added taxation. The Tax Administration data used in the analysis cover years 2005-2014.

We exploit the two changes in the energy tax system that took place in years 2011 and 2012 to examine possible correlation between energy tax refunds and firms' competitiveness. We consider two sets of regressions: First, we

exploit variation within the group of tax refund recipients to analyze the success of these firms from year 2005 to year 2014. Second, we compare the success of tax refund recipients to other firms in the same industry that have an equally high capital/employee -ratio and number of employees.

The competitiveness indicators that we use in the analysis are productivity (measured by value added per employee), total revenue, annual change in total revenue, net profit margin, return to capital, value of exports, annual change in exports, number of employees, change in the number of employees, and the share of exports in total revenue.

In addition, we considere levels and changes in the total balance sheet value and mean wages as dependent variables. These measures are not generally considered to be competitiveness indicators and were examined here in order to shed light on how firms may have used the tax refunds – that is, whether tax refunds may have been used towards investments/growing the balance sheet or e.g. wages or bonuses.

We use panel regression methods and control for other factors that may affect firms' competitiveness: e.g., the number of employees in year (t-1) , share of exports in total revenue (t-1) , total revenue (t-1), imports (t-1), the share of service exports in EU-exports, different time trends, and the mean for competitiveness indicator for similar firms.

Results

We ran numerous panel regression models in attempt to find a relationship between different competitiveness indicators and the energy tax refunds. The results do not indicate any robust and significant correlation between the energy tax refunds and firms' competitiveness.

Conclusions

This study analyses the possible association between Finland's energy tax refunds, offered to energy-intensive industries, and several measures for firms' competitiveness. Out of the several competitiveness measures studied we do not find any with a robust and significant correlation with the receiving of energy tax refunds. These preliminary findings are in line with previous literature, which has found no causal link between energy tax rebates and firms' international competitiveness (Arlinghaus 2015). Based on the descriptive analyses, it is not surprising that the Finnish energy tax refund system does not seem to meet its objective: the energy tax repayments have been 0-0.3 percent of the revenue for most recipients. In addition, recent literature on firms' international competitiveness has emphasized that firm level factors affect competitiveness the most (e.g. Goddard et al. 2005, Hottman et al. 2016). Therefore, policies aiming at improving only cost competitiveness may not be the most effective ones. However, according to our findings the system can affect market competition between and within sectors in Finland since the systems allows only firms from few specific sectors to apply to the refunds and the 50000 euro deductible in the system favors large, incumbent firms.

In addition to the market distortion problem, the Finnish energy tax refund system is problematic with regard to general objectives of energy taxation. When some of the largest consumers of energy products and therefore largest emitters of CO2 pay only 15% of the normal marginal energy tax, the incentives provided by the energy taxes for reducing energy consumption are hampered. Overall cost-efficiency in reducing CO2-emissions would require that marginal costs of emission reductions are equalized across emitters; the tax refund works against the cost-efficiency objective by differentiating the marginal CO2-tax across firms.

The results documented here stem from an analysis that we plan to complement with an analysis based on data with a longer time frame and more detailed energy use data. These data would allow us to match firms receiving a refund to firms that are otherwise very similar but did not qualify for a tax refund.

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