

English summaries

JOUKO KINNUNEN: *The Economic Effects of Global Warming — Will Finland Benefit?*

This article surveys the cost-benefit analyses made about global warming. An estimate of the Finnish costs and benefits is also presented. The emphasis is on analysis with a 50-year perspective, during which the atmospheric concentration of greenhouse gases is expected to double.

It is shown that the results of the analyses made about the United States vary to a great extent. There is no common criteria to use in making monetary estimates, either.

According to William Nordhaus way of estimating the vulnerability of the Finnish economy to climatic change, Finland is twice as vulnerable as the U.S.A. On the other hand, protectionistic Finnish agricultural policy has safeguarded the food security in Finland. It could be said that Finnish agriculture has been for decades prepared for the greenhouse effect-like disturbances in the global agricultural trade.

The likely impacts of warming are evalua-

ted for different industries in the Finnish economy. It is shown that there is no clear evidence that global warming has strongly negative effects in the 50-year perspective. Finnish agriculture and silviculture are expected to gain from the greenhouse warming. There are possibilities of catastrophic outcomes, though.

The greatest costs of greenhouse warming for Finland seem to consist of international aid etc., which Finland would possibly incur in order to alleviate the problems of the countries not favoured by the nature. Therefore, it is proposed that future development aid should be taxed from today's energy consumers.

Finally, the impacts are measured in FIM per a ton of carbon dioxide using the theoretic framework presented by Nordhaus. The most likely outcome of CO₂ doubling is slightly positive ranging from FIM 1,1 to FIM 29,0 per ton of CO₂. In the long run, more negative outcomes are likely. That is why for the long range planning, estimates from FIM 100 to FIM 400 FIM per ton of CO₂ for the benefits of greenhouse warming abatement are proposed.

ILMO MÄENPÄÄ: *Economic effects of carbon dioxide reduction in Finland*

The analysis is based on the results of the FMS model system, the Finnish Model System. FMS is a multisectoral equilibrium growth model, which is connected with a comprehensive energy consumption and production and air emission submodel.

As measures of reduction of carbon dioxide emissions the carbon tax is analyzed in detail. Subsidies to energy saving investments and basic plant alternatives in electricity production are analyzed also. Behind the analy-

sis is the result of the model system that there is potential for more efficient energy use economy which is socially profitable, but it is never carried out without additional measures.

In the assessment of the effects of the carbon tax many starting assumptions are important: is the tax domestic on international; how are the tax incomes used; how do the other cost factors of the economy adapt in the face of the foregoing competitiveness to the new cost item; does the tax change attitudes towards readiness of the energy saving also?

The carbon tax is assumed to be compensated in the taxes of households so that the ag-

gregate tax rate of the economy does not change.

The energy related carbon dioxide emissions grow in the scenario referred to by about 40 percent from the year 1990 to the year 2005. In this study a gradually increasing year-end 500 FIM/ton CO₂ carbon tax in 1990 prices is applied. In some analyzed cases the tax is sufficient to stabilize the emissions at the year end to the level of 1990, in most cases however a higher tax is needed. The tax 500 FIM/ton CO₂ raises the average price of the energy by some 60 percent.

In combination with a carbon tax the investment subsidy facilitates the pressures to maintain foreign competitiveness. Especially an investment subsidy may facilitate adaptation in the

transition period.

One basic assumption in the analysis has been that the needed additional electricity is produced by coal condensation power. Three alternatives in electricity production are compared: normalized 1000 MW coal, nuclear and natural gas stations. In the conditions of the reference scenario the nuclear power station diminishes carbon dioxide emissions by about 8 percent and the natural gas station 4 percent. The nuclear power station yields slightly higher level of the economic activity than the coal station and the natural gas station a bit lower. In the conditions of the carbon tax the social profitability of the nuclear station increases; the natural gas is socially more profitable than coal in this case also.

MARKKU WALLIN: *Needs and possibilities of CO₂-taxation*

Manmade CO₂-emission result entirely in practice, from combustion of fossil fuels. So far most countries have announced research and development and the setting of technical standards for energy productions and use as their preliminary means of curbing the emissions. However, because of the wide and innumerable types of fossil fuel in use it is easy to see that the taxation of CO₂-emissions or taxation of the energy use would be by far the most effective means of steering the development.

The evidence from recent studies made by the OECD clearly shows that the difference in fuel taxation between countries has already affected their emissions in relation to GNP. Raising the fossil fuel taxation in certain countries where its level is presently very low could

diminish the world emissions even by several percent. The effects of a tax of the type and magnitude planned in the EC (equivalent to 10 \$ per barrel of oil) taken into use OECD-wide could diminish the world emissions by dozens of percent. The total change is however effected by the adjustments made with the present energy taxation.

Other studies made with global models tell us that we have a very long and costly process with steadily rising CO₂-taxes if we are going to limit the emissions to the present level. The trend shows the necessity of raising the fuel prices even manifold, which certainly would encourage the development and use of non-polluting energy. But it also begs the question of the need to increase international monetary transfers even manifold compared to the present official development aid.

OLAVI RANTALA: *Exchange rate expectations aggravate cyclical changes — would tax wedges help?*

The paper shows that the interest rate changes induced by expectations of exchange rate band shifts may have aggravated the cyclical chan-

ges in the Finnish economy. The long history of the devaluation cycle has become ingrained in the financial market agents' expectations so that a slow-down in export and production growth may easily provoke devaluation expectations. The devaluation expectations raise the interest rate and this will aggravate the reces-

sion. The vicious circle may continue until a positive external shock comes. Then the recovery of the economy leads gradually to revaluation expectations and lowers the interest rate. This feeds back to the economic growth and so the cycle will be repeated.

At times it has been suggested that the exchange rate band applied in Finland should be widened. In principle this could alleviate the overshooting interest rate reactions but probably only for the short maturities.

In practice the widening is not a feasible option because Finland has applied for membership in the EC. The EC is on its way towards EMU which means that Finland will have to switch to the normal ± 2.25 percent range of the ERM. Nevertheless, in the medium term, before the possible participation in the full EMU, the exchange rate risk remains. The recovery of the Finnish economy may again lead to revaluation expectations, a lower interest rate and expansion of domestic demand, but this can hardly be avoided by monetary poli-

cy alone.

The only way to stabilize the effects of the exchange rate expectations and procyclical interest rate reactions is to use countercyclical fiscal policy. However, it should become much more forward-looking and effective than it has been so far. As to the problem of the procyclical interest rate movements, stabilizing effects on domestic demand could be obtained from countercyclically adjusted tax wedges, e.g. investment taxes and subsidies.

Moreover, the private consumption and housing investment could be stabilized by adjusting the deduction of the interest expenses of loans in income taxation. Especially, the deductibility of interest expenses of new loans could perhaps be adjusted relatively easily because the income effects would be fairly small. Yet the substitution effect on the timing of household expenditure via the change in the after-tax interest rate on new loans might be considerable.

TUOMAS LARJAVAARA: *Strengthening the rules on international export credit agreements*

In exports of capital the unit value is often very high, and financing is one of the most important means of competition. The increase in officially supported export credits has been a difficult problem due to credits subsidies, especially in trade with developing countries and in some sectors of industry. A good example of this is the shipbuilding industry, which has been very heavily subsidized for years without any positive results.

The empirical findings do not support the hypotheses that measures taken to ameliorate the international competitiveness and production potential of capital goods exporting enterprises with subsidies are effective.

The Arrangement on Guidelines for Officially Supported Export Credits («the Consensus») came into force on April 1, 1978. As an indication of the keen export credit competition the terms of the arrangement are continuously

scrutinized and new definitions and interpretations made.

One of the key factors in export credit policy has been concessional financing (tied aid credits, mixed credits). The subsidy element in this field has been substantial and has distorted both trade and aid flows.

After two years of negotiations, the OECD countries came to an agreement on an important package («the Helsinki Package») of measures to strengthen the rules on commercial and aid credits. The package came into force on February 15, 1992.

Under agreement, except for the credits to Least Developed Countries, a project that would be financially viable with commercial credits will not receive any tied aid credits. This principle reflects a new approach. These efforts are expected to result in the careful weighing of potential trade distortions against aid benefits. The Helsinki Package also measures that limited interest rate subsidies, in particular in relation with export credits to middle income countries.