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IMPLICATIONS OF PROMOTING BIOFUELS IN DEVELOPING COUNTRIES

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Overview

Biofuels are enjoying growing worldwide interest as concerns about security of energy supply and climate change are moving into the focus of policy makers. The reason is that biofuels are considered by many to be the only feasible option for the substitution of fossil fuels in the transport sector.

More and more developing countries are examining possibilities to substitute fossil fuels in the transport sector by locally produced biofuels. IEA (2006:394) expects the production of biofuels in developing countries to increase substantially in the following years. In fact, climatic conditions in many developing countries are beneficial for biomass production and biofuel feedstock crops in particular. However, with the exception of bioethanol from Brazil, production costs of biofuels are significantly higher than those of their fossil counterparts. Therefore, promotion measures like tax exemptions or blending quotas are indispensable for triggering substantial biofuel demand. These promotion measures are most frequently justified by environmental benefits, security of energy supply and job creation in the agricultural sector.

Yet, biofuel production does not only trigger the desired positive impacts. Promotion policies might either burden the national budget or the fuel consuming households and firms. Furthermore, crop production often requires massive acreage, and environmental effects are two-edged. Therefore, biofuel programs have to be scrutinised carefully in order to avoid welfare losses.

Method and Results

This paper illustrates applied promotion measures and investigates their justification and implications with special focus on developing countries. Illustrative examples from both industrialised and developing countries are given in order to examine empirically the implications of biofuel programs. Recent experience from Europe shows that tax exemptions are able to create substantial biofuel demand but induce massive tax losses at the same time. The Brazil experience illuminates the potentials and problems that developing countries may face.

Since exemption from mineral oil taxation is the most frequently applied promotion instrument, the paper examines the economic justification of mineral oil taxation in general and discusses the appropriateness of tax credits for biofuels. The theoretical justification of taxation given by Newbery (2005) – internalising environmental externalities, charging for road usage and improving the efficiency properties of the remaining feasible taxes – only rationalizes the exemption of biofuels from taxation to such an extent as they avoid greenhouse gas emissions. However, it is argued to consider the overall environmental balance, in particular in the case of developing countries. The reason is that the contribution of least developed countries to CO_2-emissions – and thus their abatement potential – is very limited. In contrast, local effects due to intensive agricultural production could have serious consequences for living conditions of people in developing countries. This includes both

environmental effects and implications for food markets due to increased land competition initiated by biofuel feedstock production (ESMAP 2005).

However, if carefully implemented under the appropriate conditions, biofuel programs might confer feasible opportunities for certain developing countries.

Conclusions

If promotion of biofuels is decided to be appropriate, blending quotas seem to be the preferred measure. The reason is that the quotas are much more precise concerning the targeted outcome, preventing a "genie is out of the bottle-effect", which is often observed in renewable energy policies when feed-in tariffs are applied. In the case of tax exemptions, forces of the manipulated market are not always controllable and overproduction might be the consequence. Resulting distortions on feedstock markets and environmental consequences are more difficult to control. Since agricultural production is essential in these countries, any governmental promotion of energy crops should be carefully scrutinized with regards to agricultural conditions, i.e. fertilizer, irrigation and acreage requirement.

As the potential of first generation biofuels is limited in most regions of the world, countries should always focus on paving the way for the promising second generation biofuels. The performance of second generation biofuels is much better with regards to all critical factors: Local pollution, GHG abatement and high-quality farmland requirement. In general, biofuels should not only be compared with fossil transport fuels. Stationary biomass utilisation for electricity generation should also be taken into account, as it is in most cases the more efficient option in terms of both costs and land usage (Frondel and Peters 2007).

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