

POLITO-ECONOMIC ASPECTS OF RENEWABLE ENERGY: VOTING ON THE LEVEL OF RENEWABLE ENERGY SUPPORT

Vladimir Udalov, Schumpeter School of Business and Economics,
Phone: +49 (0)202 439 3176, e-mail: udalov@wiwi.uni-wuppertal.de

Overview

The significant and continuous increase in CO₂ emissions causes global warming which poses a risk of rapid, drastic changes in human and natural systems. In recognition of these issues, governments across the globe have set targets for carbon reduction. Renewable energy provides one of the leading solutions to meet these ambitious targets. However, under the current circumstances renewable energy technologies cannot compete with conventional technologies. In order to become competitive and to replace conventional energy sources, renewable energy technology needs to be promoted with supportive policies, leading to a rapid scale-up of these technologies.

Although many people recognize climate change as a serious problem that warrants action, their public awareness and concerns can change due to the effects caused by the renewable energy support. On the one hand, the costs of renewable energy support (RES) are transferred to consumers, thereby causing a negative consumption and an income effect in a short run. On the other hand, apart from the improvement of environmental quality, in the long run, RES leads to the decrease in electricity prices due to the continuously fall of levelised cost of electricity of renewable energy technologies (Fraunhofer ISE (2013)) and the merit order effect (Fürsch et al (2012)). These effects vary across different population groups, especially regarding age structure. To the author's best knowledge, the existing literature has not paid sufficient attention to the investigation of these short and long run effects of RES on the different population groups. This paper aims to analyze the impact of the above described short and long term effects on the level of RES, which is accepted by the different population groups.

Methods

For this purpose, an overlapping generation model (OLG) can be applied. Specifically concerning the environmental policy a broad range of studies apply the OLG framework. They can be distinguished with regard to the degree of responsibility of the agents for the environment. Howarth and Norgaard (1992) assume that agents do not care about pollution. In this model, a social planner internalizes the externalities by means of taxes. John et al. (1995) suppose that agents' utility can be affected by the environmental quality and the government is in charge for environmental maintenance. They analyze the conflict between capital accumulation and environmental quality. Based on John et al. (1995), Ono (2004) considers the impact of population aging on environmental quality. Jouvét et al (2007) investigate the impact of environmental quality on mortality of the agents by using a two-period OLG model in which the longevity is influenced positively by health expenditure but negatively by pollution due to production. Mariani et al (2009) analyze the two-way causality between the environment and longevity.

Results

To fill the above described research gap, a theoretical two-period politico-economic OLG model is introduced. The present model is based on the approach of John et al. (1995) and analyzes voting decisions regarding the level of renewable energy support made by different generations living in the same period. The following OLG framework can be used. The population consists of young and old individuals. Each generation lives for two periods. Young individuals are endowed with one unit of labour which they supply to firms inelastically. Working individuals allocate their income between current consumption, current savings and renewable energy investment. When old, individuals supply their savings to firms, consume the return and also support the renewable energy. In the period t both population groups face a tension between consumption and RES, whereas in the next period RES improves environmental quality and decreases electricity prices. Facing these effects, individuals vote on the level of RES. Young individuals suffer from decreasing consumption due to RES and benefit from a better quality of environment and increasing consumption because of declining electricity prices in the next period. Thus they will vote for a higher level of RES. As for old individuals, they unambiguously lose from RES, since they don't live in the next period, and, similar to the young individuals, suffer from decreasing consumption due to RES. Therefore they will vote for a minimum level of RES. There is an intergenerational conflict due to the contradictory interests. Since the policy preferences of the two politically active population

groups diverge, the voting outcome is determined by a government of politically motivated but short-lived representative that maximizes the aggregate life time utility of the electorate. The actual voting outcome is situated between the contradictory preferences of the old and young individuals. Depending on the size of the exogenous parameters, the level of RES varies between the voting preferences of young and old individuals.

Conclusions

Based on the results of the model, we can show that population aging and a higher preference for the present reduce the level of RES and therefore are harmful for the environmental quality, whereas a higher effectiveness of RES for the improvement of environmental quality and future electricity price reduction leads to an increase in the level of support. As a result, this model offers a good starting point for possible medium to long term policy recommendations in order to increase the accepted level of RES.

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