ACCOUNTING FOR FREERIDER EFFECTS IN POLICY EVALUATION: BETWEEN STATISTICAL ROBUSTNESS AND EASE OF USE FOR EVALUATORS

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Overview

Ex-post policy impact evaluation of energy and climate policies based on methods involving counterfactuals have been part of the recommended methodology since many decades. In practice, this is not always followed: obtaining counterfactuals is often expensive and complicated, depending on the complexity of the policy measure and the appetite of the individual public bodies involved. This often leads to inaccurate measurements of key indicators of success of energy policy measures, in particular the freerider effect. This paper presents a methodology to bring together the difference-in-differences method of evaluating policy effectiveness and the traditional method of estimating freerider effects in state aid evaluation.

The freerider effect is one of the primary effects that can hamper the efficient use of state aid measures in the energy sector. Governments that aim to encourage the use of particular energy technologies need to implement the state aid measures at the right time in the innovation cycle of the technology in question so that state aid reaches those recipients that would not have invested in those technologies without the aid. In recent years, this discussion has been of extreme relevance to policies involving electric vehicles, industrial energy efficiency measures, and even public transport subsidies, among others. While estimating GHG Emission reductions of the policy measure, or the cost efficiency of the measure, the freerider effect is deducted.

In the absence of an evaluation method involving counterfactuals, the freerider effect is typically estimated by directly surveying the aid recipients and asking if they would have invested in the technology in the absence of state aid. This method, while having the advantage of being direct and relatively inexpensive, is bereft with problems of social desirability bias. Despite the use of cheap-talk in the surveys to elicit truthful answers, it is highly likely that admitting to freeriding is not in the interest of the aid recipient, either due to fears of negative implications on the aid already received, or on the possibility of future aid.

Methods involving counterfactuals, such as difference-in-differences, two-way fixed-effects (TWFE), or the use of synthetic controls are recommended not only by policy evaluation textbooks, but also by the EU guidelines on state aid evaluation, for instance. However, ascribing the observed effects from a difference-in-differences estimation to freerider effects, while theoretically uncomplicated, is empirically unclear. This paper therefore presents a methodology to translate the effects observed in a difference-in-differences estimation of policy impact to freerider effects. An empirical example is presented through the evaluation of a subsidy for electric trucks offered by the German federal government since 2021.

The resulting methodology is aimed at policy evaluators: the method combines the advantages and statistical robustness of methods involving counterfactuals and the relative simplicity of the traditional methods of accounting for freerider effects.

Methods

The paper builds on the difference-in-differences method to estimate causality of energy subsidy programme implementation on the outcome (typically GHG emissions savings or energy consumption savings). A methodology to translate the effects observed in a difference-in-differences estimation to an estimation of freerider effects is provided, thereby allowing for policy evaluators to more easily integrate these results into their policy evaluation

frameworks. The methodology involves obtaining data from two control groups as opposed to the typical one, and ascribing the difference between the two control groups to the freerider effect.

Results

The paper presents a new methodology for policy evaluators, therefore there are no direct results for the paper as such. There is a case study presented on the German subsidy programme for electric trucks, and the implementation of the methodology to this case is presented.

Conclusions

Policy evaluators need to have easier access to robust methods of estimating the effectiveness of energy policies. Using the methodology presented in this paper, evaluators can combine the statistical robustness of methods involving counterfactuals (like difference-in-differences) with traditional methods of estimating freerider effects.