

GREENING THE COVID-19 ECONOMIC RECOVERY: LESSONS FROM THE FINANCIAL CRISIS

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Overview

The global economic downturn caused by the COVID-19 pandemic is the worst economic contraction since the Great Depression. In addition to the recession, the world faces a simultaneous pandemic. The first public spending programmes focussed on immediate health and economic issues caused by the pandemic and the required lockdown measures. Consequently, climate and environmental concerns faded into the background (Helm, 2020). So far, little of the fiscal spending was directed at green investments such as clean energy or pollution abatement (Barbier, 2020). During the crisis, however, the focus has started to shift from short-term responses to the challenge of a long-term response. There is an increasing number of calls from economics, climate activists, journalists, etc. to ensure that the economic recovery is in line with the transition towards sustainable low-carbon economy (Hepburn et al., 2020).

In our paper, we analyse the environmental impacts of green stimulus measures based on the experience from the Financial Crisis. After the crisis, governments launched major economic stimulus packages. Between 2008 and 2010, major economies spend more than USD 3.3 trillion on stimulus packages, of which around 16% were devoted to green measures such as low-carbon energy, energy efficiency, recycling, and pollution abatement (Barbier, 2016). Several studies have analyzed or discussed the impacts of these measures in order to derive lessons learned for the post-pandemic recovery (e.g., Barbier, 2020; Jäger et al., 2020; Kröger et al., 2020). However, systematic empirical analyses of the impacts of economic stimulus packages on green investments or pollution abatement are lacking. This paper tries to fill this gap.

We collect data on stimulus packages in the aftermath of the 2008 Financial Crisis from various sources. Our main data source is Barbier (2016), which contains information on total stimulus spending as well as different categories of green stimulus spending for the G20. We extend this dataset based on data from other studies (e.g. Strand and Toman, 2010) and various government reports and documents, which yields a sample of 27 OECD countries. One challenge stemming from the green stimulus packages is that they contain various measures addressing different sectors and technologies. In order to identify an impact channel of a specific measure, we focus on renewable energy investment, as the green stimulus data contains the information how much stimulus was allocated to the renewable energy. Furthermore, less than half of the countries in the sample had fiscal spending on low-carbon power, such that the other countries can be used as a control group. In addition, we also analyse the impact of overall the aggregate green stimulus (relative to overall stimulus) on environmental variables, such as CO₂ emissions and the ecological footprint of production.

We obtain data on renewable energy investments from Bloomberg New Energy Finance (BNEF). BNEF contains project-level data on investments in utility-scale renewable energy plants that we aggregate to annual national investments. Compared to other measures of renewable energy deployment, e.g. change in capacity, Bloomberg records an investment deal when the financial deal is closed, i.e. notably closer to the actual investment decision. As for the analysis of environmental impacts of green stimulus, we use World Bank data on CO₂ emissions per capita and data on the ecological footprint of production per capita from the Global Footprint Network. Data for various control variables for both analyses, such as GDP, energy use, and manufacturing and services value added, are also obtained from World Bank. Based on the resulting country-panel dataset covering 27 OECD countries, we investigate (i) the effect of renewable energy stimulus on investments per capita and (ii) the impact of green stimulus on the environment.

Methods

Difference-in-difference approach: only a sub-sample of OECD countries had dedicated renewable energy stimulus packages. We use countries with economic recovery measures for renewable energy as the treated countries, while all other countries serve as the control group.

Fixed Effects Regressions: we estimate the impact of the share of green stimulus on CO₂ per capita as well as the ecological footprint of production per capita.

Results

First, countries with dedicated renewable energy stimulus packages experienced higher renewable energy investments after the stimulus compared to the control group without such packages.

Second, the share of green stimulus in total stimulus leads to, on average, lower CO2 emissions and ecological footprint of production in the post-stimulus period.

Conclusions

With respect to CO2 emissions, our findings suggest that, irrespective of the type of stimulus, CO2 emissions per capita decreased in the aftermath of the Great Recession. This seems not to be the case for the environmental footprint of production. There seems to be an effect of green stimulus spending on emissions that is similar to the findings on renewables investments: a higher share of green stimulus yields additional results in both additional emission reductions as well as a significantly lower ecological footprint of production in the post-stimulus period.

Overall, the findings indicate that the renewable energy sector recovered quickly after the Financial Crisis. Dedicated stimulus packages, however, resulted in substantially higher renewable energy investments in the post-stimulus period. A possible next step for the analysis could be comparative case studies of individual countries using a synthetic control method (Abadie et al, 2015). This approach allows for very granular insights that can complement the diff-in-diff analysis.

These findings seem to indicate that type of stimulus spending has persistent impacts on a country's development. Overall, these lessons from the economic and environmental impacts of the green stimulus in the aftermath of the Financial Crisis provide valuable insights for policy makers designing the post-COVID19 recovery.

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