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# Is unemployment good for the environment?

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ABSTRACT

Environmental quality is a public good, potentially impacted by everybody. Individual level pro-environmental behavior affects environmental quality in the aggregate. Therefore, it is important to understand what causes individual's pro-environmental behaviors to change. We quantify the causal effect of one determinant, unemployment, using an EU-27 population representative Eurobarometer survey. Drawing on results from the theory of the private provision of public goods, and recognizing that unemployment decreases income and the opportunity cost of time, we formulate testable predictions that unemployment will decrease the extent of pro-environmental behaviors that require monetary contributions and increase the extent of pro-environmental behaviors that mainly require time/effort. Instrumental variables regressions provide empirical evidence to support these hypotheses. Changes in the unemployment rate within a sub-national region provide the exogenous variation needed to identify the causal effect. Several supplemental questions on the survey provide evidence that environmental issues lose saliency and economic issues gain saliency when one becomes unemployed, suggesting that interested parties may wish to emphasize cost savings of pro-environmental behavior rather than environmental benefits during times of increased unemployment.



## 1. Introduction

Previous studies have examined the determinants of pro-environmental behavior (PEB), mostly focusing on the effects of observable personal characteristics and environmental attitudes. It is important to understand what affects PEB because this can potentially provide insight into which interventions are more likely to encourage behavioral changes. In this paper, we specifically address how unemployment affects PEB. There are several reasons why we may expect unemployment to alter one's extent of PEB. Clark et al. (2003) note that PEB can be viewed as an example of the private provision of a public good. In theoretical models, utility maximizers trade off some private benefit of providing the public good with the private cost. Income is important in these models because it will affect budget and/or time constraints and hence the private cost of contributing to a public good. Income clearly decreases during unemployment, suggesting that PEB may similarly change. Moreover, previous research suggests that behavior may change during unemployment because the opportunity cost of time decreases. For example, Ruhm (2000) finds that unemployment leads to improved health outcomes. Similarly, we may hypothesize that PEB would change with unemployment because of the changing opportunity cost of time.

PEB can manifest in a variety of settings. Some PEB's mainly require time and/or effort as inputs whereas other PEB's require only monetary contributions. Leaning on theoretical findings that income can be important for explaining voluntary contributions to public goods and recognizing that unemployment changes the opportunity cost of time, we formulate

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testable hypotheses about how unemployment will affect PEB. We predict that behaviors mainly requiring time/effort as inputs will increase with unemployment and behaviors mainly requiring financial contributions as input will decrease with unemployment. We then empirically test these predictions using individual level data on unemployment and PEB.

One empirical challenge is that individual unemployment status may be endogenous in that unemployed individuals may be different from employed individuals in unobservable ways that could affect the extent of their environmental behaviors. Thus, we take a new approach in this paper to address this endogeneity; we instrument for an individual's unemployment status with NUTS-2[1] level regional unemployment to estimate the average causal effect of unemployment status. Our key identifying assumption is that changes in NUTS regional unemployment affect the probability of an individual being unemployed but have no direct effect on an individual's environmental behaviors. That is, it is the individual's economic situation that determines their environmental concern and behavior, not the macroeconomic situation that determines one's environmental concern and behavior.

We utilize a representative sample of approximately 30,000 EU-27 individuals to investigate how unemployment affects an individual's extent of PEB. Our main sources of data are two waves (2007 and 2011) of Special Eurobarometer surveys on environmental issues. These surveys provide information on a range of environmental behaviors along with demographics including employment status. Employing NUTS-2 level fixed effects, we exploit variation in unemployment rates within a region over time. Normally, unemployment rates within a region would be quite similar over the span of a few years. However, given the timing of the surveys, the global macroeconomic shocks that took place beginning in 2008 provide a source of exogenous variation in unemployment for the first stage equation.

We find evidence that unemployment impacts the probability that an individual conducts 3 of the 8 possible PEB's[2] on the survey at conventional significance levels. The local average treatment effect is positive and significant for reducing energy usage (0.48–0.77) and reducing car usage (0.35–0.47) and negative and significant for purchasing environmentally labelled products (−0.21 to −0.31). Furthermore, while not statistically significant at conventional levels, we find estimated LATE's that are substantial in magnitude for three other behaviors including reducing disposables (−0.28 to −0.33), separating waste for recycling (0.08–0.23), and purchasing local products (−0.30 to −0.35). On the whole, these results agree with our testable predictions. Furthermore, we find that it is important to address endogeneity because we obtain quite different results when treating individual unemployment as exogenous.

Our stance differs from the Kahn and Kotchen (2011) perspective that a state's unemployment rate affects individuals' relative concern for the environment. They provide evidence of waning environmental concern as unemployment increases by examining google search trends. We note that they examine search data aggregated to the state level so the relationship they document between state level unemployment and environmental concern is also consistent with individual unemployment causing the environmental concern. In a second analysis of climate change survey data, Kahn and Kotchen (2011) do not find a significant relationship between individual unemployment status and probability of reporting concern about climate change. They do, however, find a significant relationship between state level unemployment rates and environmental concern, but only when omitting time dummies.

Environmental economists have long been concerned with the relationship between economic well-being and environmental preferences and behavior. Much of this work relates to aggregate behavior on the macroeconomic level. For example, there is a long line of research on the Environmental Kuznets curve, which postulates an inverse-U-shaped relationship between economic development and environmental protection. The main criticism to this literature is that it has not effectively established a causal link between economic growth and environmental protection. That is, it has not effectively explained the specific factors that may translate increased income into environmental quality (Carson, 2010). Another challenge is that there are alternative explanations for an observed inverse-U-shaped pattern (Andreoni and Levinson, 2001). As such, many economists have concluded that there is little to infer from the EKC literature (Carson, 2010). Yet, it is important for policymakers to understand how economic variables affect environmental behavior.

We are not aware of any other papers that have looked at the causal effect of individual level unemployment on pro-environmental behavior. Several papers have explored the descriptive relationship between unemployment and environmental preferences. For example, Torgler and García-Valiñas (2007) examine a wide set of independent variables to explore the determinants of Spanish individuals' environmental attitudes using data from the World Values Survey and European Values Survey. They include employment status in their analysis, but do not find a significant relationship between employment status and environmental attitudes. Torgler et al. (2012) analyze the European Values Survey and find unemployed individuals exhibit a higher probability of stating that littering is justified as compared to full-time employed individuals. Witzke and Urfei (2001) analyze the determinants of willingness to pay for environmental protection, including occupation status. Relative to an individual being employed, only individuals who are engaged in household work have a significantly different willingness to pay. Veisten et al. (2004) find some evidence that individual unemployment is correlated with lower willingness to pay for environmental amenities. However, none of the aforementioned treat occupational status as endogenous, so they are not seeking to identify a causal effect of unemployment.

[1] Nomenclature of Territorial Units for Statistics (NUTS) is the Eurostat hierarchical system for dividing up the economic territory of the EU (Nomenclature of Territorial Units for Statistics, 2014).

[2] The range of the magnitude of the LATE (local average treatment effect), representing the average change in the probability of a complier performing the behavior within the last month, is given in parentheses.