

What drives green innovation in Europe? A cross-country comparison based on CIS data.

Ida D'Attoma and Silvia Pacei

Department of Statistical Sciences, University of Bologna, Italy

Abstract

The present paper focuses on the driving forces behind the adoption of different types of eco-innovation mode in German, Romanian and Portuguese manufacturing sectors over 2012-2014, through an empirical analysis of the community innovation survey (CIS). To this end, in our empirical study, we considered a measure of eco-innovation performance that counts different types of eco-innovation that enterprises have undertaken. Moreover, we considered a wide and comprehensive set of potential drivers, including “technology push”, “regulatory push-pull” and “firm specific factors” clusters of drivers. Due to the count nature of our dependent variable and to the large presence of zeros, we estimate a zero-inflated negative binomial model (Greene, 2009; Hilbe 2007).

Some papers discussed the existence of a positive relationship between eco-innovation and firm performance and growth, thus motivating the identification and the analysis of trigger factors for eco-innovation (Russo and Fouts, 1997; Buysse and Verbeke, 2003; Liao and Tsai, 2018). In this scenario, investigating eco-innovation determinants can be helpful for policy-makers and managers who wish to promote its adoption and diffusion (Ghisetti and Pontoni, 2015). Moreover, over the past decade, several empirical works have analysed the drivers of eco-innovation for single countries and especially among manufacturing firms because of their higher environmental impact, but there is still a lack of country comparisons (Horbach, 2016; Ghisetti et al al. 2015 as exceptions).

We consider data taken by the CIS carried out in 2014, as a special section devoted to “innovation with environmental benefits” was included in that survey wave.

Among the EU countries for which CIS 2014 data were available and the section devoted to “innovation with environmental benefits” was included in the questionnaire, we decided to compare three countries, Germany, Romania and Portugal, which differs under different aspects, such as the economy, the institutional context and above all the eco-innovation performance. Moreover, the intense interplay between the three countries considered makes worth to analyze eco-innovation determinants they might share. Germany is the most important trading partner and the country number-one importer and exporter for Romania. Germany and Portugal are also important trading partners between them, while less strict is the trade relationship between Portugal and Romania.

The CIS defines an eco-innovation as “a new or significantly improved product (good or service), process, organizational method or marketing method that creates environmental benefits compared to alternatives”. The definition is not only confined to the technological sphere but it also encompasses organizational and market aspects.

As anticipated, the outcome of our model was the number of eco-innovations adopted by a firm and ranged from 0 (no eco-innovation strategy were in place) through 10 (all environmental strategies were implemented). Then, due to the count nature of our dependent variable Y and the large presence of zeros, we use the zero-inflated Negative Binomial regression model (ZINB), that is a “two-part” count data model, as it considers two data generation processes simultaneously influencing the outcome.

Our findings highlight how the different regulatory contexts and different levels of competitiveness of the market affect the firms’ eco-innovation behavior in the three Countries. Apart from the determinant representing the “degree of cooperation among firms”, that is highly significant for all the three countries, we notice that in Germany the largest firms and those firms belonging to low tech sectors and characterized by a high level of protection tend to adopt more eco-innovations. The largest firms and firms belonging to low tech sectors tend to adopt more eco-innovations also in Portugal, while the level of protection adopted by the firm is not relevant in this country. In Romania, instead, firms more open to the external, that are those more involved in cooperation and

export, tend to be more eco-innovative. Finally, regarding the proxy variable that we use for representing the “environmental regulation”, it is found to be a significant stimulus to eco-innovation above all in Germany, confirming the effectiveness of the advanced regulation developed in Germany with respect to eco-innovation activities.

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