

ENERGY POVERTY ACROSS SPAIN: BEFORE AND DURING CRISIS

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Overview

Energy poverty is not a new phenomenon in Spain and in many other European countries (Bouzarovski, Petrova, and Sarlamanov 2012; Halkos and Gkampoura 2021). It is a structural problem, present in many Spanish households before the Covid-19 emerged. However, the economic disruption thus far caused by the Covid-19 pandemic and the global energy crisis triggered by Russia's invasion of Ukraine have exacerbated pre-existing inequalities related to energy affordability.

The debate in Europe about the problem of energy poverty is more present than ever, not only as an energy issue but also as a broader social concern related to climate change, poverty, and health deprivation (European Commission, 2020; 2021). The academic literature has focused its efforts on the dominant discussions on the concept and metrics of the energy poverty (Moore 2012; Romero, Linares, and López 2018; Tirado Herrero 2017), however the identification of the drivers behind the energy poverty is still widely debated with ambiguous and heterogeneous results. Furthermore, as the EU Energy Poverty Advisory Hub (2022) has recently highlighted the identification of households at risk of energy poverty should be more accurate at regional level since different contexts may require tailored policies. Spain is a country characterized by profound regional differences in socioeconomic characteristics and climatological conditions that deserves special attention. Although many studies in this field have already carried out at national level, they only show a static identification of the energy poverty in a certain period of time, showing an incomplete picture of the whole problem. Understanding the determinants of being energy poor at regional level and the new forms of vulnerability among population, is fundamental for evaluating the potential that public policy can have in attempting to eradicate the persistent problem of energy poverty.

The main objective of this study is to analyse the critical drivers of households falling into a situation of energy vulnerability at regional level. Apart from providing an update on the current extent of energy poverty in Spain, we contribute to the existent literature and the ongoing debate on energy poverty in several ways. First, exploring the incidence, evolution, and determinants of energy poverty in Spain in the period 2006-2021, offers the possibility to examine four distinct economic periods. Second, to account for the multi-dimensional nature of energy poverty, we use different energy poverty indicators. This allows us to identify differences and similarities in the determinants of the energy poverty. Finally, we analyse energy poverty as a spatially uneven phenomenon quantifying the effects of energy poverty determinants at a national level.

Methods

To examine the critical drivers of being into a situation of energy vulnerability at regional level we collect information from the two sources of information. The main one is the Spanish Household Budget Survey (HBS) providing a sample of more than 300,000 household level data on energy expenditure and a wide variety of socioeconomic variables. This database is complemented with extreme temperatures at the regional level using heating degree days (HDD) and cooling degree days (CDD) statistics from Eurostat at regional (NUTS2) level.

To analyse the main drivers of being in a situation of energy poverty we apply a discrete choice univariate probit. To do this a dichotomous dependent variable was constructed (Y_{it}) that takes the value 1 when a household is in a situation of energy poverty according to different indicators proposed by the economic literature (10%, 2M and Low Income High Cost) and 0 when a household is not considered to be energy poor. Specifically, the following equation is estimated:

$\Pr (Y_{it} = \text{Energy poor} | X) = \Phi (\beta_0 + \delta_1 \text{ dwelling characteristics}_{it} + \delta_2 \text{ socio-economic characteristics}_{it} + \delta_3 \text{ labour market characteristics}_{it} + \delta_4 \text{ climate factors}_{it} + \varepsilon_i$

where Pr stands for probability, the matrix of explaining variables (X) contains a set of determinants that explain whether a home is considered to be energy poor, δ corresponds to the vector of coefficients to be estimated and reports the effect of a variable on the latent propensity for a positive result, Φ is the cumulative distribution function of the standard normal distribution, and finally, ε_i is the idiosyncratic error term.

Results

Spain is a country characterized by profound regional differences in socioeconomic characteristics and climatological conditions. This is reflected in important regional differences in the energy poverty indicators. For example, considering the 10% and 2M indicators the relatively poor, rural, and cold regions of Castilla y León and specially Castilla la Mancha suffer from very high levels of energy poverty. These two regions are also the most affected by energy poverty using the LIHC indicator although the difference with the rest of the regions is much smaller.

Preliminary results of this empirical exercise point out towards relevant considerations. Firstly, energy poverty tend to worsen during the economic crisis and the probability of being energy poor is higher for those who are retired and women living alone (factors closely related to income level and household composition). Our empirical results also point the importance of the economic activity performed by the household members in determining the probability of being energy poverty. The results furthermore draw attention to the enormous regional differences on the energy poverty rates. To sum up, the results show that the drivers of energy poverty could be spatially homogenous (in particular socio-economic characteristics of the household tend to be national level drivers) or heterogenous (dwelling characteristics, climate factors seem to be regional-specific drivers).

Conclusions

There is little doubt that energy poverty is a structural problem in Spain (especially in autonomous communities around Madrid) and is likely to persist in coming years in consequence of post-pandemic effects and the energy price increases due to Ukraine crisis. Emergency-interventions or temporal measures (income perspective) are not enough to tackle this problem, meaning that it is essential to design new tools that can have a real impact in the medium and long term. For these reasons, the analysis and research interests on energy poverty is now more important than ever, to set up a more comprehensive understanding of the magnitude and the root of this problem at national and regional level, which is an essential step towards an effective just energy transition.

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