

# The Dynamics of Energy Poverty in Spain

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## (1) Overview

Recent estimates suggest that approximately 10% of the Spanish households (equivalent to 4 million people) were in energy poverty as of 2010 (Tirado Herrero et al 2012a), with the excess winter mortality rate in Spain among the highest in Europe (Tirado Herrero et al 2012b). Reducing the proportion of households defined as energy poor has become an increasingly important policy objective.

While counting the number of energy poor and the characteristics of those in energy poverty has received recent research attention, there has been little empirical work considering the dynamics of energy poverty. As in the wider literature on income poverty, while considering the extent of energy poverty at a point in time provides information on its importance and characteristics, arguably, this is perhaps less of a policy issue if upward mobility out of energy poverty is high. On the other hand, if certain individuals remain 'trapped' in energy poverty, policy makers should be more concerned about the phenomenon.

The aim of this paper is to examine the dynamics of energy poverty in Spain. We use longitudinal information from the *Survey on Income and Living Conditions* for Spain (2007-2010) to examine a number of key questions on energy poverty mobility. For example, what is the extent of individual mobility into and out of energy poverty? What proportion of individuals are persistently energy poor? Are there particular individual characteristics that influence the probability of whether an individual moves out of or into energy poverty? Recent research by Waddams Price et al (2012) shows there are significant differences between those defined as energy poor under objective measures compared to those defined as energy poor using subjective measures. Hence, we consider both objective and subjective measures in the analysis.

## (2) Methods

From the *Survey on Income and Living Conditions* for Spain (2007-2010) a balanced panel of individuals who remained in the survey in all four years was constructed. This provided a total sample of 20900 observations consisting of 2787 women and 2475 men observed over the four year period. The quantitative measure of energy poverty used here is based on the proportion of household income spent on energy bills, and we use a 10% energy expenditure threshold (of net income excluding housing costs). We also use three qualitative energy poverty measures analogous to those used by a range of authors for Spain and elsewhere (e.g. Tirado Herrero et al 2012; Waddams Price et al 2012), namely, whether householders feel able to afford adequate heating, whether they report late payment of utility bills, and whether they feel their house is damp. Consistent with work by other authors (Tirado Herrero et al 2012a,b), using the 10% cut off as the quantitative definition of energy poverty implies that around 10% sample were energy poor by 2010.

The longitudinal information on individuals is used to construct a Markov matrix that traces movements between energy poverty categories over the four years available. We exploit the dynamic information available to provide a more detailed picture of the degree of heterogeneity of

those experiencing energy poverty by detailing the distribution of energy poverty spells and the characteristics of those who experienced energy poverty ‘temporarily’ and ‘persistently’ during the four-year period. Finally we consider results of life-table estimates which provide estimates of how the probability of an energy poverty exit depends on the number of periods spent in energy poverty.

### **(3) Results**

Analogous to the evidence on time spent in poverty (Jarvis and Jenkins, 1997, 1998), while the majority of the sample are not energy poor (using both quantitative and qualitative poverty measures), the total proportion who have at least one period in energy poverty over the four year period is substantially greater than the average energy poverty statistic reported for any single year (at nearly 20 percent for the expenditure measure and nearly 50% for the combined subjective measure). Further, a small proportion of the sample can be characterized as persistently energy poor. The results which consider the basic transitions into and out of energy poverty show lower (higher) mobility out of (into) energy poverty when the subjective energy poverty measure is considered. Also, for the expenditure based energy poverty measure, there is a relatively high degree of entry into the energy poverty category for those energy spending is just above the energy poverty threshold. For those individuals who have just started a spell in energy poverty, the results suggest significant duration dependence exists, with the conditional probability of exit after two periods in energy poverty being significantly smaller than the probability of exit after one period.

### **(4) Conclusions**

The results from this analysis show that extending the analysis of energy poverty from the standard static analysis to a one focusing on the trajectories and experiences of individuals, provides a range of insights which should help policy makers better understand the phenomenon of energy poverty.

### **References**

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