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ENERGY CONSERVATION IN THE RESIDENTIAL SECTOR: ARE INFORMED HOUSEHOLDS MORE LIKELY TO RENOVATE?

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Residents are often encouraged to renovate their homes as a means of lowering consumption of and expenditures on energy through increased efficiency. From a public policy perspective, an increase in energy efficiency is considered a desirable contribution of the residential sector to the security of energy supply and to climate protection. One factor hindering progress on this front is that households are often unaware of their possible energy saving options. Even if the options, themselves, are known, reliable information on the likely payback (i.e. the monetary equivalent of the conserved energy) is missing. As a consequence of this information deficit, many financially attractive refurbishments remain undone. In Germany, the government aims to resolve this problem by subsidizing energy conservation consultancies, with the expectation of increasing both the likelihood of home renovation and residential energy efficiency.

This paper tests if such consultancies have their expected effect. We develop a random utility model that incorporates characteristics of individual households as well as the cost and return of a refurbishment for a specific household. The data are drawn from a survey of 2,500 single-family homes conducted in 2005. The data include not only socioeconomic and demographic variables for each household but also a suite of technical attributes describing the design characteristics of each home (e.g. surface dimensions, heating source, etc). Using computer-aided design (CAD), we combined this information with regional earnings data of craftsmen to calculate the costs of the various renovations. Specifically, we focus on four types of renovations – new windows, facade/roof insulation, and a change of the heating system – as these were mainly covered under the consultancy program.

The decision-framework analyzed in this paper can be conceptualized in terms of three tiers. The highest tier represents the binary decision to seek consultancy on renovation options. Tier two, also binary, concerns whether to undertake one or more of the renovations covered by the consultancy. Finally, tier three is multinomial and includes all the possible combinations of renovations that could be undertaken, conditional on a positive response in tier two. The resulting structure is hierarchical and sequential, treating the influence of consultancy as being channelled through the tier two-choice between renovating and doing nothing. To analyze this structure empirically, we employ a mixed logit model with error components. By specifying dummy variables for the tier one and tier two error components, this approach serves to account for the interdependence among alternatives that could otherwise produce biased parameter estimates.

Preliminary results indicate that the utilization of an energy conservation consultancy has a significant positive effect on renovation behaviour. However, our estimates demonstrate that the consultancy effect differs between the several refurbishment options. While we found a significant effect for an insulation improvement, no effect was found for the installation of a new heating system. This pattern might be due to the fact that technical

advice for heating systems may come from a craftsman with secondary expertise, such as a plumber.