Urban Separation and the Energy Consumption Efficiency of Chinese Households: A Meta-frontier Analysis

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Abstract

In any economy, large amounts of energy are wasted every year. This has spurred an increased interest in providing an empirical benchmark of inefficient energy consumption e.g. how much more energy is being consumed than needs to be. Useful insights have been offered for industrial firms and also aggregate regions including European countries, US states and Chinese provinces. An area that is currently lacking evidence however is the household unit of analysis. This study therefore explicitly quantifies the energy consumption efficiency for a sample of almost 11,000 Chinese households in 2012. These households are distributed across cities, towns and villages. To account for the unique features of these location types, the frontier demand models that have appeared in previous studies are extended into a meta-frontier demand function. Doing so offers a unique and detailed picture of energy consumption, energy efficiency and also spillover potentials among Chinese households. The key result is that Chinese households are only 77% efficient. Village households turn out to be the overall efficiency champions, but also the most in need of energy assistance – this gives room to advocate a range of policies for energy education and energy assistance tailored to household specific characteristics.

Keywords: Energy consumption efficiency; Frontier demand function; Urban separation; Chinese households.

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