Worldwide Spatial and Temporal Structural Decomposition Analysis of Energy Consumption

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Concern for worldwide energy security has been underpinned in the process of globalization. Understanding the drivers underlying past and current energy consumption trends is vitally important for governments, security planners and international organizations. We therefore investigate the input-output tables in constant prices extended with energy consumption for a) quantifying the key long-term drivers those have led to the diversified energy consumption profiles of 187 countries around the world from 1990 to 2010, b) identifying which countries and sectors are recording an increase in energy consumption, and c) shedding light on the implications of these drivers for national economic and political policies. We undertake this empirical analysis in terms of three prevalent Structural Decomposition Analysis (SDA) methods with the data support of the homogeneously-classed version of the Eora Multi-Region Input Output (MRIO) database. Our work provides a first, broad overview about the magnitude and distribution of these drivers across countries by showing that a) generally population affluence plays an accelerating effect on energy consumption, whereas industrial energy intensity retards energy consumption, b) the temporal trends of drivers show different typology for developed and developing countries, and c)empirical evidence on driving factors of energy consumption is sufficiently sound to foster our understanding of worldwide energy consumption pattern and energy security.