Accepted Manuscript

Multiplicative structural decomposition analysis of aggregate embodied energy and emission intensities

Bin Su, B.W. Ang

PII: S0140-9883(17)30142-1
DOI: doi:10.1016/j.eneco.2017.05.002
Reference: ENEECO 3633

To appear in: Energy Economics

Received date: 28 January 2017
Revised date: 29 April 2017
Accepted date: 2 May 2017

Please cite this article as: Su, Bin, Ang, B.W., Multiplicative structural decomposition analysis of aggregate embodied energy and emission intensities, Energy Economics (2017), doi:10.1016/j.eneco.2017.05.002

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.
Multiplicative structural decomposition analysis of aggregate embodied energy and emission intensities

Bin Su\textsuperscript{a,*}, B.W. Ang\textsuperscript{b}

\textsuperscript{a} Energy Studies Institute, National University of Singapore, Singapore
\textsuperscript{b} Department of Industrial and Systems Engineering, National University of Singapore, Singapore

Abstract

Aggregate intensity indicators, such as the ratio of a country’s energy and emissions to its GDP, are often used by researchers and policymakers to study energy and environmental performance. This paper analyzes the relationship between energy (or emissions) and value added (or GDP) from a different viewpoint, namely from the demand rather than the production perspective, using the input-output (I-O) framework. The aggregate embodied intensity (AEI), defined as the ratio of embodied energy (or emissions) to embodied value added, can be defined at the aggregate, final demand category and sectoral levels. The total aggregate intensity can be presented as a weighted sum of the AEIs at the final demand category or sectoral level. Changes of the AEI at different levels can be decomposed to identify the driving forces using multiplicative SDA. A study using the latest 2007 and 2012 datasets of China indicates that (a) its aggregate intensity of CO\textsubscript{2} emissions was mainly determined by the AEI in investment and (b) the emission intensity effect generally contributed the most to the AEI ratio changes at different levels. The proposed framework can be applied to other aggregate intensity indicators and extended to multi-country/region analysis.

Keywords: Aggregate Embodied Intensity, Input-Output Analysis, Structural Decomposition Analysis, Energy Consumption, Carbon Emissions, China

JEL: C67, P28, Q43, Q54, Q56, R15

* Corresponding author. Tel.: +65-6601-2075; Fax: +65-6775-1831.
E-mail address: subin@nus.edu.sg; subin.nus@gmail.com (B. Su).
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات