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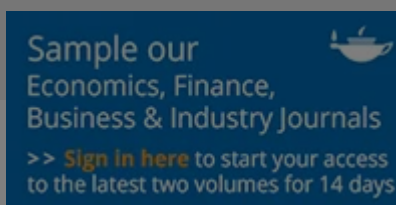
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# On Biomass Energy Consumption and Real Output in the US

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## Abstract

This empirical note utilizes US annual data from 1949 to 2007 to examine the causal relationship between biomass energy consumption and real gross domestic product (GDP) with the following hypotheses:

unidirectional relationship between biomass energy consumption and real GDP growth rate.

Keywords

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Notes

<sup>1</sup>Energy

<sup>2</sup>National Renewable Energy Laboratory, [www.nrel.gov](http://www.nrel.gov). [Balat and Ayar \(2005\)](#) survey world trends toward biomass energy use while [Kaygusuz \(2009\)](#) provides a review of the production, consumption, and technologies for biofuels in developed and developing countries.

<sup>3</sup>The US Department of Energy (DOE) undertakes a number of programs to facilitate the development of biomass as an energy source: The DOE Biofuels Program develops new technologies to utilize low-cost cellulosic biomass into ethanol; the DOE Biopower Program addresses biomass-based electricity generation systems and the development of sustainable energy crops; and the DOE Regional Biomass Energy Program provides cost-sharing and other support to state and local governments in the production and use of biomass energy.

<sup>4</sup>Much of the discussion of the hypotheses and related literature is drawn from the survey article on the causal relationship between energy consumption and economic growth by [Payne \(2010\)](#).

<sup>5</sup>The following are the dates in which data is reported by the Energy Information Administration ([www.eia.doe.gov](http://www.eia.doe.gov)) for the various subcategories of biomass energy consumption: wood (1949–2007), waste (1970–2007), and biofuels (1981–2007).

<sup>6</sup>The use of real gross fixed capital formation as a proxy for capital follows the work of Soytaş and Sari (2008) and citations therein.

<sup>7</sup>Test statistics for Granger-causality have the standard asymptotic distribution to draw valid inferences



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