Combining Sustainability and Quantitative Models - An Analysis for the Countries of The BRICS

SARTORI, S. [a,*], CAMPOS, L.M.S.[a]; SAMOHYL, R.[a]

a. Federal University of Santa Catarina, Florianópolis

*Corresponding author, simone.sartori@posgrad.ufsc.br

Abstract

The interest in the development of indicators to measure sustainability is growing, but there are few studies about the changes of these indicators over time. In this context, this paper presents a temporal analysis of CO_2 emissions for the BRICS countries (Brazil, Russia, India, China and South Africa) on period of 1980 to 2010, except for Russia (1992 to 2010). The analysis of CO_2 emissions here treated as an indicator of sustainability, presenting in the preliminary current situation and future emissions of these countries on a horizon of 10 years. Although the series analyzed and estimated to be short, it revealed some important information. The estimation by means of ARIMA models and exponential smoothing coefficients showed statistically significant. From a practical point of view, the ARIMA model has better adhesion to the series since it had the lowest Akaike Information Criterion (AIC). The estimated growth of CO_2 emissions confirms the unsustainability of the BRICS future. Finally, the experience of this study suggests the use of predictive models for quantitative analysis of sustainability.

Keywords: Sustainability, CO_2 emissions, ARIMA, Exponential Smoothing.