

Evaluation of efficiency trends in the Brazilian construction industry

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Abstract

The Brazilian construction industry has been marked by many fluctuations in performance in recent years. In 2009, it was directly affected by the economic crisis, and the sector suffered a severe recession, followed by a slight recovery. By characterizing this sensitivity to the variations of the economy, the sector is closely linked with country's development. This work performs an analysis of the reflection of these constant oscillations in the performance of companies that operate in the Brazilian civil construction sector in the period 2005-2015. This study is based on Data Envelopment Analysis (DEA) models, and Malmquist Index of Total Factor Productivity (TFP). The TFP Malmquist index is used to calculate the change in total factor productivity over the period breaking it down into variations of technical and scale efficiency as well as technological progress. Results show that for the analyzed constructors set, regression in the overall and pure technical efficiency could be evaluated. It could also be observed that most companies operate outside their optimal market scale and that efficiency scores and changes in total factor productivity decreased between 2005 and 2015.

Keywords

Data Envelopment Analysis, Civil Construction, Malmquist TFP Index, Efficiency, Productivity.

Biographies

Carlos Ernani Fries is currently Associate Professor in the Department of Production and Systems Engineering at UFSC (Federal University of Santa Catarina). Mr. Fries holds a Master and PhD in Production Engineering from UFSC. He has taught courses of Operations Research applied to Manufacturing, Decision Theory, Data Analysis, and Statistics among others. His research interests include Simulation, Optimization, Management Games, and application of Big-Data tools. He is member of IEOM and INFORMS.

Daniel Holstak holds a Bachelor's degree in Production Engineering from the Federal University of Santa Catarina (UFSC). He has been active in the development and implementation of lean improvement programs in the textil and plastics industry.