"Gheorghe Asachi" Technical University of Iasi, Romania

FUZZY FINANCIAL APPRAISAL FOR RAILWAYS PROJECTS

Dana Al Sheikh∗, Jamal Omran

Construction Engineering and Management Dep., Faculty of Civil Engineering, Tishreen University, Lattakia, Syria

Abstract

Global economic uncertainty, energy security and climate change impact are imposing mounting pressures on public finances. Investments in major railways infrastructure projects are faced with new challenges to provide rigor business case to better inform investment decisions. This study tests deploying Fuzzy Sets Theory to address future uncertainties in the financial evaluation when appraising railways projects. The results reported: 1- the economic viability of railways projects is influenced by changes in investment costs, operations and maintenance costs, and revenues; reliance on innovative green technologies help reducing this influence, 2- the application of Fuzzy Sets Theory enable addressing uncertainty associated with investment decisions, 3- stakeholders are likely to support investment in infrastructure projects that deploy green technology and innovative green processes. The study clearly identifies the fundamental relationship amongst uncertainty in estimations, green technology, and investment decisions. It further provides a new model for appraising railways projects, illustrating the applicability of this model on a case study. Policy makers are encouraged to create a shared-outcome funds for railways projects that leverage the use and development of environmentally friendly technologies.

Key words: discount rate, fuzzy internal rate of return, fuzzy present worth, fuzzy α-cut

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∗ Author to whom all correspondence should be addressed: e-mail: dana.m.alsheikh@tishreen.edu.sy; Phone: 00963-933 834 340