Transport project evaluation: feasibility risk assessment and scenario forecasting

This paper presents a new approach to transport project assessment in terms of feasibility risk assessment and reference class forecasting. Conventionally, transport project assessment is based upon a Cost-Benefit Analysis (CBA) where evaluation criteria such as Benefit Cost Ratios (BCR) are obtained. Recent research has however proved that substantial inaccuracies are present when obtaining the monetary input to the CBA, particularly as concerns the construction costs and demand forecasts. This paper proposes a new approach in order to address these inaccuracies in a so-called Reference Scenario Forecasting (RSF) frame. The RSF is anchored in the cost-benefit analysis; thus, it provides decision-makers with a quantitative mean of assessing the transport infrastructure project. First, the RSF method introduces uncertainties within the CBA by applying Optimism Bias uplifts on the preliminary construction cost estimates. Hereafter, a quantitative risk analysis is provided making use of Monte Carlo simulation. This approach facilitates random input parameters based upon reference class forecasting, hence, a parameter data fit has been performed in order to obtain validated probability distribution functions. The latter have been placed and ultimately simulated on the inaccuracies of determining demand forecasts, i.e. leading to travel time savings and ticket revenues of the project. Finally, RSF makes use of scenario forecasting where trend scenarios such as economic growth and level of cross-border integration are investigated. The latter is highly relevant as RSF is demonstrated by a case example concerning the fixed link between Elsinore in Denmark and Helsingborg in Sweden.