

ABSTRACT

Zhang, Zhibo. M.S.C.E., Purdue University, May 2013. Evaluating Long-term Leasing of Toll Roads based on Probabilistic and Multiple-Criteria Techniques. Major Professor: Samuel Labi and Kumares C. Sinha.

The long-term leasing of toll roads, a type of public-private partnership (PPP), has been attracting the attention of state governments since the two landmark cases of the Chicago Skyway and the Indiana Toll Road in 2005 and 2006, respectively. In order to assist public agencies in making appropriate decisions to enter PPP agreements that are in the best interest of taxpayers, a general framework is established in this thesis for evaluating the long-term leasing of toll roads. Value for money analysis, which takes into account transferred risks and retained risks through probabilistic technique, is used as a main criterion for measuring the economic efficiency from the public sector perspective. User benefits and user costs are incorporated with value for money through multiple-criteria technique. The evaluation framework is demonstrated using a case study of the lease of the Indiana Toll Road. The analysis shows that over the lease period, there is very little likelihood that the Indiana public agency, if it had continued in-house management of the toll road, would have earned at least the same financial return compared with the upfront payment lease amount paid by the lessee for the Indiana Toll Road. On the basis of the multiple criteria considered in the evaluation, there is evidence to suggest that the Indiana government undertook efforts to protect the interest of Indiana residents in the long-term lease of the toll road.