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Risk allocation in public-private partnership water supply projects in Ghana

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Abstract

Appropriate risk allocation (RA) between public and private sectors according to their risk management (RM) capabilities is crucial for the success of public-private partnership (PPP) projects. The RA process in PPP water projects is examined, and a methodology based on fuzzy set theory is outlined with RA principles that can be used by public-private participants to arrive at fair RA decisions. Empirical data based on an industry-wide three-round Delphi questionnaire survey is used in this study to outline the methodology. The fuzzy set theory is employed for the RA analysis because it deals well with the complex multi-criteria problem of, and precisely accounts for the fuzziness inherent in human cognitive process that characterize, RA decision-making. Five risk factors are evaluated on each RA principle, analysed and assigned between the public and private sectors. The results show that it is appropriate to allocate risks according to both sectors' RM capability to manage them, using established RA principles and fuzzy

set theory. The methodology renders the decision-making process more systematic and practical because the fuzzy theory approach allows decision makers to express their evaluations of both sectors' RM capabilities in descriptive qualitative terms. The results should assist public clients to establish efficient RA strategies and develop balanced RA schemes for PPP contracts, with a view to achieving a mutually acceptable RA with the private sector.

Keywords:

Fuzzy set theory

public-private partnership

risk allocation

water supply.

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Disclosure statement

No potential conflict of interest was reported by the authors.

Notes

1. Available at <http://bit.ly/1CIZHui> (accessed 25 October 2014).
2. See these studies for discussions of experiences of private sector participation in water services.

3. The debate on private versus public efficiency is extensive (e.g., Davis, [2005](#); Kirkpatrick et al., [2006](#); Hassanein and Khalifa, [2007](#); Marin, [2009](#)) and is beyond the scope of this research.
4. Readers may refer to Fuest and Haffner ([2007](#)), Bohman ([2010](#)) and Ameyaw and Chan ([2013](#)) for reviews on Ghana's water PPP progress.
5. In 2000, one year into the contract, Stone and Webster declared bankruptcy and was replaced by New Jersey-based energy giant, Covanta, which also filed for bankruptcy in 2001 following the energy crisis in California which affected its cash flow.



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