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Volume 24, 2006 - Issue 4

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Valuation of the minimum revenue guarantee and the option to abandon in BOT infrastructure projects

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Pages 379-389 | Received 18 Oct 2004, Accepted 24 Oct 2005, Published online: 19 Mar 2010

Cite this article https://doi.org/10.1080/01446190500434997

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Abstract

The real option approach is used to value the minimum revenue guarantee (MRG) and the option to abandon in Build-Operate-Transfer infrastructure projects. The option to abandon is formulated under an investment option held by the concessionaire at contract signing and to expire before construction commencement. MRG is formulated as a series of European style put options in a single option pricing model. When combined with the option to abandon in the pre-construction phase, MRG is reconstructed as a series of European style call options to develop a compound option pricing formula. The Taiwan High-Speed Rail Project is chosen as a numerical case to apply the formulas. The results show both MRG and the option to abandon can create values. When MRG and the option to abandon are combined, they will counteract each other and their values will thus be reduced. Increasing the MRG level will decrease the

value of the option to abandon, and, at a certain MRG level, the option to abandon will be rendered worthless.

Keywords:

BOT | infrastructure | real option | option to abandon | minimum revenue guarantee

Acknowledgements

The authors wish to thank the National Science Council for research grant under contract number NSC 93-2211-E-009-043.

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