

ABSTRACT

Valuing Simple Multiple-Exercise Real Options in Infrastructure Projects

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The revenue risk is considerable in infrastructure project financing arrangements such as build–operate–transfer (BOT). A potential mitigation strategy for the revenue risk is a governmental revenue guarantee, where the government secures a minimum amount of revenue for a project. Such a guarantee is: (1) only redeemable at distinct points in time; and (2) more economical if the government limits the guarantee’s availability to the early portions of a BOT’s concession period. Hence, a guarantee characterized by this type of structure takes the form of either a Bermudan or a simple multiple-exercise real option, depending upon the number of exercise opportunities afforded. The multi-least-squares Monte Carlo technique is presented and illustrated as a promising approach to determine the fair value of this variety of real option. This method is far more flexible than prevailing approaches, so it represents an important step toward improving risk mitigation and facilitating contractual and financial negotiations in BOT projects.

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