Sovereign Cat Bonds and Infrastructure Project Financing

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Abstract:

We examine the opportunities for using catastrophe-linked securities to reduce the total costs of funding infrastructure projects in emerging economies. Our objective is to elaborate on methods to reduce the necessity for unanticipated (emergency) project funding immediately after a natural disaster. We also place the existing explanations of sovereign-level contingent capital into a catastrophic risk management framework. In doing so, we address the following questions:

> Why might catastrophe-linked securities be useful to a sovereign nation, over and above their usefulness for insurers and reinsurers?
>
> Why are such financial instruments ideally suited for protecting infrastructure projects in emerging economies, under third-party sponsorship, from low-probability, high-consequence events which occur as a result of natural disasters?
>
> How can the willingness-to-pay of a sovereign government in an emerging economy (or its external project sponsor), who values timely completion of infrastructure projects, for such instruments be calculated?

To supplement our treatment of these questions, we use a multi-layer spreadsheet-based model (in Microsoft Excel format) to calculate the overall cost reductions possible through the judicious use of catastrophe-based financial tools. We also report on numerical comparative statics on the value of contingent-capital financing to avoid project disruption based on varying costs of capital, probability and consequences of disasters, the feasibility of strategies for mid-stage project abandonment, and the timing of capital commitments to the infrastructure investment.

We use these results to identify high-priority applications of catastrophe-linked securities, so that maximal protection can be realized if the total number of catastrophe

instruments is initially limited. The paper concludes with potential extensions to our model and opportunities for future research.

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