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The Incremental Expected Shortfall-Based Pricing: Application to a Cost-Effective Hedge of an Electricity Price-Volume Quanto Risk

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Abstract

To evaluate complex hedging deals from a cost-efficiency perspective, this paper proposes a new hedging-effectiveness measure, the Economic Value of the Incremental Expected Shortfall (EV-IES), which summarizes the costs and benefits of a hedging strategy by taking into account firm-specific and observable variables such as the weighted average cost of capital and the marginal corporate tax rate. The EV-IES, shown to be monotonic, concave, and scale-invariant, offers an intuitive and clear guideline regarding acceptance/rejection of a proposed hedging deal. To illustrate the application of the EV-IES, our empirical study considers a fictitious Chicago-based electricity load-serving entity facing a price-volume joint risk. Using electricity price derivatives, weather derivatives, and tailor-made electricity-temperature quantity-adjusting (quanto) contracts, we illustrate how to find an optimally cost-efficient hedging strategy, a break-even premium for quanto contracts, and a hedging strategy for achieving a firm's target expected shortfall level.

Keywords: Hedging Evaluation, Quanto Contracts, Financial Risk Management

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