

Defaultable Options under Imprecise Information

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This study proposes a structural model for defaultable options in a fuzzy environment. The proposed model is capable of dealing with market state variables, including firm value and fractional recovery rate, which are uncertain factors that differ from probabilistic essence and exhibit difficulty in determining precise price values exactly, namely they are market variables about which investors have only imprecise information. Since the unavailability of reliable accounting data makes the true value of firm assets unobservable, this study takes the advantage of fuzzy logic and adds a source of uncertainty to the classical stochastic default model, such as that of Klein (1996), to improve model performance. To show the robustness of the proposed model, some daily data of call options price are used to investigate its reliability. The empirical results demonstrate that the proposed fuzzy logic model has significantly better performance than previous structural form models and is indeed a useful means to manage prices risk for both option buyers and writers. This study is provided with the aim of offering insights into future research on defaultable options pricing under imprecise market information.

Keywords: Fuzzy Measure, Triangle-type Fuzzy Number, Defaultable Option, Imprecise Information, Structural Model.

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在資訊不精確環境下 評價具違約性質之選擇權*

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本文提出一個新的評價模型考慮當市場處於資訊不確定的情境下，欲對具違約性質之選擇權契約進行定價的實用方法。此模型可以解決當市場投資人面對如公司價值、償還率等不確定市場變數時且本身僅擁有一些不夠精確的資訊狀況下，無法藉由傳統選擇權評價模型得到準確的價格之難題。由於市場中大多充斥著不可靠的會計資訊，因而造成真實的公司資產價值無法觀察。因此本文嘗試運用模糊理論的邏輯為基礎，將古典隨機違約模型(這裡採用 Klein (1996)的模型為代表)中之不可觀察變數進行模糊化，進而改進模型之預測績效。為了顯示本模型的可靠性及實用性，本文使用台灣認購權證日資料進行實證測試，實證結果說明我們改良後的模糊結構性模型擁有較佳的預測能力，且經過嚴格的統計測試後，此績效顯著優於原始結構性模型的預測績效。因此本模型對於選擇權的買賣雙方確實提供了一個有效控管價格風險的新工具。最後，本文對於未來有興趣研究在不精確市場資訊下，欲對具違約性質之選擇權定價時，提供了一些新的概念與思考方向。

關鍵詞：模糊測度、三角形模糊數、可違約選擇權、不精確資訊、結構性模型。

* 作者感謝行政院國科會社會科學研究中心之專題研究計畫補助【NSC99-2410-H-006-036】及兩位匿名審稿者之寶貴意見。

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