

學術論著

遺傳規畫決策樹模型於房貸提前償還之風險管理

Genetic Programming Decision Trees in the Risk Management of Mortgage Loan Prepayment

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摘要

本文應用無母數的GP-DT模型於房貸提前償還的風險管理，並與文獻上常用的Logit模型比較。實證結果顯示，無母數的GP-DT模型之整體平均正確率均高於Logit模型；而考慮不同的切割值時，Logit模型無論在樣本內外均無一致性，GP-DT模型則呈現一致性的結果，其中以GP-DT500的整體平均正確率最佳。此外，演化代數愈高的GP-DT模型亦有較佳的評估績效。透過誤判成本觀察，我們亦發現，不同的GP-DT模型仍一致性地優於Logit模型。而除Logit-3外，當成本率增加時，各模型的誤判成本卻降低了，其中以GP-DT 500-1、GP-DT 500-2最佳。我們應用敏感性分析來瞭解各特徵變數對提前償還的影響程度，其重要性依次為授信用途、擔保品座落縣市、職業、貸款契約利率、性別、年齡、貸款金額、屋齡、貸款年限。最後，本文亦提出房貸提前償還的風險管理系統，可做為實務上的參考。

關鍵詞：提前償還、遺傳規畫決策樹模型、風險管理、成本率、誤判成本

ABSTRACT

This paper applies a nonparametric GP-DT model to the risk management of mortgage loan prepayment. While previous empirical studies used the Logit model as a benchmark, the results of this study show that GP-DT models have better accuracy on average than Logit models. When considering different cut-off values, the Logit model is not consistent either in sample or out of sample. However, the GP-DT models present consistent conclusions. The GP-DT 500 has a higher overall average accuracy. In addition, the higher the number of generations, the better the GP-DT model's performance. Furthermore, the GP-DT model is also consistently superior to the Logit model in terms of misclassification costs. When the ratio costs increase, the misclassification costs also decrease in most models, except the Logit-3. Among the GP-DT models, the GP-DT 500-1 and GP-DT 500-2 models offer the best performance. Using sensitivity analysis, this study also examines the influence of the key variables on prepayment. In order of importance, these variables include the loan purpose, location, type of occupation, loan interest rate, sex, age, the loan amount, year of housing, and loan period. Finally, this paper also proposes a practical risk management system for mortgage loans for reference.

Key words: prepayment, GP-DT, risk management, ratio cost, misclassification cost

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