運用網絡隨機共同邊界模型
與關聯結構法
比較我國金控與非金控銀行經營效率

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　　本研究結合 Huang, Lin, and Chen（2017）的網絡隨機邊界模型與 Huang, Huang, and Liu（2014）的隨機共同邊界模型，假設銀行生產過程分爲兩階段，第一階段運用部分勞動與資本吸收客戶存款，視爲中間產出，再將其當作第二階段投入，搭配其餘勞動與資本要素，生產最終產出。運用關聯結構法推導出概似函數，並聯合估計兩個生產階段的迴歸係數，然後計算各群組兩個生產階段的技術效率、技術缺口比率及共同邊界總效率。蒐集我國樣本銀行 2002–2017 年資料，進行實證分析，發現非金控銀行第一生產階段總效率較金控銀行佳，第二階段則相反，顯示兩類銀行在不同生產階段各有其優勢。

關鍵字：中間產出、最終產出、關聯結構法、網絡隨機共同邊界、技
　　　　術效率、技術缺口比率

Comparing the Efficiency of Taiwan's FHBs and Non-FHBs in the Context of the Network Stochastic Metafrontier Model and Copula Methods

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ABSTRACT

This study employs the stochastic network model, first proposed by Huang, Lin, and Chen (2017), to compare the technical efficiency of financial holding banks (FHB) with non-financial holding banks (non-FHB) in Taiwan. The model allows banks to produce outputs through a two-stage process. Banks are assumed to hire fractional labor and capital to collect deposits at the first stage, which is viewed as an intermediate output. In the second stage, deposits and the remaining labor and capital inputs are used to produce final outputs, including investments, loans, and non-interest income. We extend the stochastic metafrontier approach, proposed by Huang, Huang, and Liu (2014), to estimate and compare the production efficiency under different technologies and two production stages. Compiling data for FHBs and non-FHBs in Taiwan spanning 2002–2017, we find that non-FHBs outperform FHBs in the first stage, while the reverse is true in the second stage.

Key Words: intermediate outputs, final outputs, copula methods, network stochastic metafrontier, technical efficiency, technology gap ratio