

# Performance of Banks in Taiwan Applying IT : An Evaluation With Data Envelopment Analysis

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## ABSTRACT

Recently, for the global financial trends has become more liberalized and internationalized, the Taiwan government has released certain protections to make market more competitive between banks. As a result, new information technology (IT) is needed to improve the performance of banking operations, and help banks to be more compatible in the market. According to Scholar Porter (1985), banking was a kind of business requiring the latest information to keep up with others, and IT can satisfy this need for banks. The data envelopment analysis (DEA) is used to evaluate how effective the IT is for banking. DEA is a linear programming methodology with multiple inputs and outputs providing a measurement of relative efficiency for decision making unit (DMU) involved. This study has first referred to relevant literature, and used data collected from survey and publications. Then the DEA model is applied. Finally, the conclusions are reached, and some suggestions come out: First, as for performance, the efficiency of new banks is better than old banks, and the performance of private banks is better than public banks. Second, as for IT, each kind of bank's technical, pure technical efficiency and return to scale is affected by different IT.

Keywords : Banking ; Data envelopment analysis ; Efficiency ; Information technology ; Performance evaluation

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## REFERENCES

參考文獻 中文部份 1. 吳世勳(1995), 「以DEA模式評估我國商業銀行之經營效率」, 國立中興大學企業管理研究所出版碩士論文。 2. 李紹璧(1995), 「資訊科技對我國銀行經營績效影響之實證研究」, 中原大學企業管理研究所出版碩士論文。 3. 邵慶國(1991), 「資訊科技投資與經營績效影響關係之一研究-本國一般銀行為例」, 淡江大學管理科學研究所出版碩士論文。 4. 徐炳勳譯(1993), 企業大轉型-資訊科技時代的競爭優勢, 第一版, 台北:天下文化。譯自 Keen, P. W. (1998)。 5. 馬裕豐(1993), 「銀行分支單位經營績效衡量模式之構建」, 國立交通大學管理科學研究所出版碩士論文。 6. 張錫峰, 周齊武(1992), 「資料包絡分析及其在效率評估上之應用」, 會計評論, 第26期, pp.76-92。 7. 曹淑慧(1994), 「資訊科技運用對銀行服務品質的影響」, 國立交通大學資訊管理研究所出版碩士論文。 8. 楊俊宏(1996), 「DEA應用在行政機關生產力衡量方法之研究-以北高二市各戶政事務所為例」, 國立中山大學公共事務管理研究所出版碩士論文。 9. 葉桂珍, 陳昱志(1995), 「銀行經營績效分析-資料包絡分析法(DEA)與財務比率之比較」, 企銀季刊, 第19卷, 第2期, pp.30-39。 10. 資訊工業策進會(1996), 「我國銀行業資訊科技應用現況與未來市場機會」, 資訊工業年鑑光碟版。 11. 廖逸君(1993), 「以DEA方法評估亞太地區航空公司的經營效率」, 國立台灣大學商學研究所出版碩士論文。 12. 樊國良(1992), 「資訊技術運用與銀行經營績效關係之研究」, 國立交通大學資訊管理研究所出版碩士論文。 13. 羅容恒, 吳桂華(1995), 「銀行經營效率之比較與改進之研究」, 臺灣銀行季刊, 第46卷, 第1期, pp. 93-122。 14. 顧志遠, 張國平(1990), 「數據包絡分析效率評估方法之應用-以台北市公車為例」, 運輸計劃季刊, 第19卷, 第1期, pp.27-38。 15. 蕭基淵(1989), 「以DEA方法探討台灣林業效率之衡量」, 國立交通大學管理科學研究所出版碩士論文。 英文部份 16. Afriat, S. (1972), "Efficiency Estimation of Production Functions", International Economic

Review, Vol.13, pp.568-598. 17. Alpar, P., and M. Kim(1990), "A Microeconomic Approach to the Measurement of Information System, Vol. 7, No.2, pp. 55-69. 18. Altman, E.I.(1968), "Financial Ratios, Discriminate Analysis and the Prediction of Corporate Bankruptcy", The Journal of Finance, Vol.12, No.4, pp.589-609. 19. Aly, H.Y., R. Grabowski, C. Pasurka, and N. Rangan(1990), "Technical, Scale, and Allocative Efficiencies in U.S. Banking: An Empirical Investigation", The Review of Economics and Statistics, pp.211-218. 20. Banker, R.D., and R. J. Kauffman(1988), "Strategic Contribution of Information Technology: An Empirical study of ATM Networks", Proceedings of 9th International Conference of Information Systems, MIN. 21. Berg, A. B., and F. R. Forsund, L. Hjalmarsson, and M. Suominen(1993), "Banking Efficiency in the Nordic Countries", Journal of Banking and Finance, Vol.17, pp.371-388. 22. Boynton, A. C., and R. W. Zmud(1985), "IT Planning in 1990's: Directions for Practice and Research", MIS Quarterly, Mar., pp.59-71. 23. Chilingirian, J. A. (1995), "Evaluating Physician Efficiency in Hospitals: An Multivariate Analysis of Best Practices", European Journal of Operational Research, Vol. 74, No.3, pp.466-384. 24. Clarke, R.L. (1995), "Evaluating Physician Efficiency in Hospitals: An Multivariate Analysis of Best Practices", European Journal of Operational Research, Vol.74, No.3, pp.466-478. 25. Drake, L., and B. Howcroft(1994), "Relative Efficiency in the Branch Network of a Uk Bank: An Empirical Study", Omega, Vol.22, Nol.22, no.1, pp.83-90. 26. Floyd, S. W., and B. Wooldridge(1990), "path Analysis of the Relationship Between Competitive Strategy, IT and Financial Performance", journal of management Information System, Vol.1, pp.47-64. 27. Frenzel, C. W. (1996), Management of Information Technology, 2nd ed., Boyd & Fraser Publishing Company. 28. Leavitt, H.J., and T. L. Whisler(1985), "Management in the 1980's", Harvard Business Review, Nov.-Dec., pp.41-48. 29. Madnick, S. E. (1991), "The Information Technology Platform", In the Corporation of the 1990's, Oxford University Press, pp.27-60. 30. McFarlan, F. W. et. Al.(1993), Corporate Information System Management:Text and Cases, 3rd ed., Irwin, Homewood, pp.98-103. 31. Madnick, S. E.(1991), "The Information Technology Platform", In The Corporation of the 1990s, Oxford University Press, pp.27-103. 32. McFarlan, F. M. (1993), Corporate Information system Management Text and Cases, 3rd ed., Irwin Homewood, pp.98-103. 33. McFarlan, "Information Technology Changes the Way You Compete", Harvard Business Review, May.-Jun., pp.98-103. 34. Miller, S. M., and A. G. Nilas(1996), "The Technical Efficiency of Large Bank Production", Journal of Backing & Finance, Vol. 20, No.3, pp.495-509. 35. Olson, M. H. (1982), "New Information system and Organizational Culture", MIS Quarterly(Special Issue), pp.71-92. 36. Oral, M., and R. Yolalan(1990), "An Empirical Study on Measuring Operating Efficiency and Profitability of Bank Branches", European Journal of Operational Research, Vol.46, No.3, pp.383-294. 37. O'Brien J. A. (1995), "Information to Information System: An End User/Enterprise Perspective, Richard D. Irwin, Inc. 38. Peffers, K. G. (1991), "Information Technology Impact on Performance: An Investigation of Investments in ATM", Unpublished Master's Thesis, Prude University. 39. Porter M. E., and V. E. Millar(1985), "How Information Gives you Competitive Advantage", Harvard Business Review, Jul.-Aug., pp.149-160. 40. Sherman, H.D., and F. Gold (1985), "Bank Branch Operating Efficiency: Evaluation with Data Envelopment Analysis", Journal of Banking and Finance, Vol. 9, pp.297-315. 41. Siems, T. F.(1992), "Quantifying Management's Role in Bank Survival", Federal Reserve Bank of Dallas Economic Review, Jan., pp.29-41. 42. Sueyoshi, T. (1991), "A study of the Relationship Between Information Technology Expenditure and Profitability in commercial Banking", Unpublished Master's Thesis, UCLA. 43. Sueyoshi, T. (1994), "Stochastic Frontier production Analysis: Measuring Performance of Public Telecommunications in 24 OECD Countries", 44. European Journal of Operational Research, Vol.74, No. 3, pp.466-478. 45. Yue, P.(1992), "Data Envelopment Analysis and Commercial Bank Performance: A Primer with Applications to Missouri Banks", Federal Reserve Bank of St. Louis Review, Vol.74, NO.1, pp.31-45. 46. Zwass, V. (1992), Management Information systems, Wm. C. Brown Publisher, pp.144-160.