

Evolution of Technical and Scale Efficiency of Taiwan' s Farmers' Credit
Unions: An Application of a Two-stage Production System

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Abstract

This paper includes undesirable outputs into the Kao and Hwang' s (2011) two-stage relational model to investigate the impact of agricultural financial reform on the technical and scale efficiencies of Taiwan' s farmers' credit unions (FCUs) by using a panel data over the period 2001-2009. The results show that the average system technical efficiency score over sample period is only 0.432 suggesting a pretty great room for FCUs to improve their efficiency. The decomposition indicates that the inefficiency is mainly from pure technical inefficiency rather than scale inefficiency. The process efficiency results signify that the efforts to improve inputs utilization efficiency in the process 1 are more important than to improve loan creation and problem loan control efficiencies in the process 2. It is also found that the FCUs positively reacted to financial reform process. The regression results show that the loan loss coverage ratio, education degree of employees, competition and economic growth are positive factors of FCUs' performances while ratios of regular members and number of branches are negative factors.

Keyword : Data envelopment analysis, Efficiency, Two-stage system, undesirable outputs, Credit unions