Sample Translation

Finance

- See below for the original Chinese manuscript.
- **A native-speaker of English who has studied finance** proofreads the translated English.
- The quality of the translated manuscript is suitable for publication in an international journal.

相異系統下之超效率模型分析

I. Introduction

Based on past literature, efficiency estimations include both parameter estimation and non-parameter estimation. The parameter estimation is represented by Data Envelopment Analysis (DEA). Although DEA provides the basis for efficiency ranking for the decision-making unit, there are two common problems with DEA. First, when traditional DEA is used for efficiency estimation and the efficiency value for several decision-making units is one, it fails to adequately distinguish these efficiency decision-making units and thus ultimately causes trouble in ranking. Moreover, the production points falling into the systems frontier have different efficiency performance due to different locations. Consequently, the original DEA will not be able to satisfy the needs. Second, in DEA the systems frontier simulates the production possibility set for an industry. However under certain conditions, an industry can have different production possibility sets. The decision-making units within an industry can be in different systems frontiers. As a result, the decision-making units within the same industry also have nonhomogeneity. Thus, when DEA is adopted, the decision-making units within an industry can be in different systems frontiers and performance assessment is unable to be conducted for the whole industry. Subsequently, we need to adopt some approaches for differentiation. Using domestic and foreign literature, it is possible to locate studies on the two problems separately. Nevertheless, there is currently no study which considers the two problems simultaneously. Therefore, this article explains the system-ranking-efficiency model to be developed to handle the nonhomogeneity problem and efficiency-ranking problem within the decision-making units in an industry.

This article uses Taiwan's securities industry as research sample. According to Taiwanese authorities, the business types for securities firms are versatile. Specifically, there are three business types: securities broker, securities dealer and securities underwriter. Integrated securities firms run the three types of business. Furthermore, those who only run one or two types of businesses are called securities brokerage firms. Given that the capital for integrated securities firms is at least $1 billion NTD, they usually have a much larger scale and broader business scope than securities brokerage firms.

Integrated security firms differ in terms of business type, market position and niche. The integrated securities firms and the securities brokerage firms also differ in relation to their business structures. Due to these differences, it seems inappropriate to assess the performance for the two types of securities firms at the same time. However, separate assessment of their performance seems to lack the ability to allow construction of a holistic picture of the securities industry. Obviously, it is challenging to assess the performance of different types of securities firms. Therefore, to resolve such a pragmatic issue, it is necessary to take a feasible, modified approach to estimate the efficiency value. Using this approach, it is possible to begin analyzing the efficiency ranking for Taiwan's securities industry correctly and effectively.

I. Introduction

文獻上對於效率的估計，可分為參數（parameter）估計法與非參數（non-parameter）估計法二種，其中參數估計法乃以資料包絡分析法（Data Envelopment Analysis；DEA）為代表。雖然資料包絡分析法提供了各決策單位效率排名之基礎，但是資料包絡分析法常見兩個問題：首先，以傳統的資料包絡法估計效率值，若有多個決策單位之效率值為 1 時，則無法對這些效率決策單位做區分，會產生排名上的困難，況且同樣落在生產邊界上的生產點，因落點位置的不同，在效率表現上應有所差距，此時原始的資料包絡法無法滿足需求。第二，在資料包絡分析中，生產邊界模擬出一個產業的生產可能集合，但在某些情況下，一個產業可能存在有不同的生產可能集合，產業內的決策單位可能分屬於不同的生產邊界，亦即同一產業內的決策單位具有異質性，因此採用資料包絡分析法時，產業內的決策單位可能會隸屬於不同的生產邊界，無法對整個產業一起做績效評估，這時我們必須利用某些方法加以區別。綜觀國內外相關文獻，有分別對此二問題討論，但未有將此二問題一起考慮者。因此，本文發展 system-ranking-efficiency 模型處理產業內決策單位有異質性與效率排名之問題。

本文以台灣證券業為研究樣本乃由於證券商營運之業務多樣，依照台灣主管機關的定義，證券商主要業務有 3 類：證券經紀商、證券自營商及證券承銷商，同時經營三種業務者為綜合證券商（integrated securities firms），而只承做一種或二種業務者稱為專業證券商。由於綜合證券商資本額至少為十億元，因此就公司規模大小來說，通常綜合券商較專業券商龐大許多，業務範圍較

廣，兩類券商營業性質不同，在市場上的優勢與利基也不同。綜合券商與專業券商在業務結構上有差異，似乎不適合貿然將兩類券商合併在一起評估其經營績效，然而當分開評估兩類券商之效率時，似乎又拼湊不出整各證券業的完整構面，因而對於不同類型的券商在評估証券業經營績效時顯得相當棘手。為解決此一實務上的問題，必須以其他可行之修正方式估計效率值，方可正確且有效的對台灣證券業作正確之效率排名分析。

綜觀國內外相關文獻，僅有少數有分別對效率排名及異質性二問題討論，但未有將此二問題一起考慮者，因此本文發展 system-ranking-efficiency 模型處理產業內決策單位有異質性與效率排名之問題，期望在實務運用上，能有效解決產業內廠商具有異質性且又有多個效率決參單位存在的問題。