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Exploring the benchmarks of the Taiwanese investment trust corporations: Management and investment efficiency perspectives

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ABSTRACT

Through an additive efficiency decomposition (AED) approach in data envelopment analysis (DEA), we evaluate the management and investment efficiencies of Investment Trust Corporations (ITCs) in Taiwan for the period 2007–2011. Furthermore, the AED-DEA and a network-based ranking approach in DEA are jointly used to rank and identify ITCs that can be treated as benchmarks. Frontier projections for ITCs are also highlighted. In general, our results demonstrate that the sample ITCs have higher investment efficiency than the management efficiency. Foreign ITCs appear to be the most efficient ones as compared to local ITCs and financial-holding ITCs. Finally, we construct a competitive map to help mutual fund managers improve their operating performance, resource allocation, and investment strategy formulation.

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1. Introduction

Since the Taiwanese mutual fund industry¹ was opened up to foreign investors in 1983, the number of investment trust corporations (ITCs) in Taiwan had increased from 4 to 38 firms in 2011. The 2011 Investment Company Fact Book released by the Investment Company Institute in 2012 also points out that the size of mutual funds issued in Taiwan increased from NT\$54 billion in 1990 to over NT\$1.8 trillion at the end of 2012. Specifically, not only the mutual fund industry in the U.S. has grown rapidly (Khorana, Servaes, & Tufano, 2005; Premachandra, Zhu, Watson, & Galagedera, 2012), but also that in Taiwan has exploded over the past few decades. Therefore, it is not surprising that the performance of ITCs has received much attention from researchers.

In the literature, significant inquiries into the fundamental question of the performance of ITCs, either at the individual level or the institutional level, can be observed; whereby mutual fund performance

(Anderson, Brockman, Giannikos, & McLeod, 2004; Hsu & Lin, 2007; Shu, Yeh, & Yamada, 2002) and its determinants (Ferreira, Keswani, Miguel, & Ramos, 2013) are studied. Recent research has also examined the efficiency of mutual fund families in the United States (Premachandra et al., 2012). However, research on the performance of ITCs at the institutional level within Taiwan, another booming market, is particularly underdeveloped due to data unavailability. It is also worth noting that Khorana et al. (2005) claim that the securities trading environment of a country plays a role in determining the attractiveness of the ultimate investment vehicle. In other words, examining individually the performance of ITCs in Taiwan might provide us with insights regarding the performance of financial institutions.

Furthermore, the mutual fund industry in Taiwan allows us to determine the performance of different groups of ITCs. Harrigan (1985) contends that strategic group analysis enables a researcher to evaluate how firms obtain long-term profits. Lawless, Bergh, and Wilsted (1989) also find that different strategic groups have differences in competitive strategies and behavioral characteristics, and the competitive situation among groups changes over times (Fiegenbaum & Thomas, 1990). Therefore, the study divides ITCs into three strategic groups based on their operating characteristics for the purpose of discussing the effects of rivalry on performance in the mutual fund industry.

To measure the relative performance of ITCs in Taiwan, this study uses a two-stage data envelopment analysis (DEA) model. Traditional DEA models that are based on one-stage activities neglect

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¹ In Taiwan, mutual funds, also known as an investment trust fund, are contract-type funds whose source of income is commission charges of fund management. Business of the Taiwanese investment trust industry mainly involves mutual funds, discretionary investments, and private equity funds, among which mutual funds accounts for the largest part.

intermediate measures or linking activities in a company and thus fail to render the message of economic activity management (Chen & Zhu, 2004; Färe & Whittaker, 1995; Tone & Tsutsui, 2009). Hence, many scholars have measured the performance of financial institutions through a two-stage production process (Kao & Hwang, 2008; Liu & Lu, 2010; Lo & Lu, 2006, 2009; Premachandra et al., 2012; Seiford & Zhu, 1999; Yang & Liu, 2012). This study utilizes the additive efficiency decomposition (AED) in the two-stage DEA model (Cook, Zhu, Bi, & Yang, 2010), which allows us to objectively measure the overall performance of ITCs as well as their performance in two individual stages. Consistent with Premachandra et al. (2012), the two-stage process of this study includes exogenous inputs in the second stage. Overall, we open up the ‘black-box’ process of performance evaluation by evaluating the management and investment efficiencies of ITCs in Taiwan.

In general, our findings suggest that ITCs in Taiwan have to first improve their management efficiency, and then they should focus on improving their investment efficiency. In addition, this study constructs a managerial decision-making matrix. This study is significant in the effect its insights may have on investment planning policy at the corporate level, in that it provides managers with suggestions to improve their operating efficiencies through a competitive map. By referring to the competitive map, ITCs can gain some inputs in allocating their resources. Moreover, the map can be applied as an analytical tool for operational improvement, investment-strategy planning, and overall business management. Furthermore, based on the benchmarking analysis in this study, the ITCs could have a good idea of their strengths and weaknesses to cultivate core competitive advantage and to produce the best possible results. That is, inefficient ITCs can learn from a benchmark ITC to work out winning strategies. The research results also could serve as references for investors and government fund supervision organizations at the governmental level in choosing excellent ITCs for entrusted management in the future.

An important consideration of concern in the DEA analysis is to increase the discrimination in the models (Liu, Lu, Yang, & Chuang, 2009). To rank and identify the true role models in the industry, we apply a network-based ranking approach in DEA (Liu et al., 2009) that is able to further distinguish the benchmark performance leaders. One of the key elements in the approach is the aggregation of DEA results for different input/output combinations so that the merits of each DMU under various situations can be considered. In other words, it can rank the efficient corporations in both stages and pinpoint the strengths and weaknesses of each organization (Liu & Lu, 2010). This study is novel in that we integrate the AED approach in the two-stage DEA model and ranking with the network-based ranking approach; we adopt the α centrality concept developed in the social network to point out the strong and weak inputs/outputs for each ITC; and we identify the top-rank benchmark ITCs for each input/output parameter.

The research results are informative to managers in the mutual fund industry on at least three counts. First, this study is significant in the effect its insights may have on investment planning policy at the corporate level, in that it provides managers with suggestions to improve their operating efficiencies through a competitive map. By referring to the competitive map, ITCs can gain some inputs in allocating their resources. Moreover, the map can be applied as an analytical tool for operational improvement, investment-strategy planning, and overall business management. Second, based on the benchmarking analysis in this study, the ITCs could have a good idea of their strengths and weaknesses to cultivate core competitive advantage and to produce the best possible results. The ranking results also could serve as references for investors and government fund supervision organizations at the governmental level in choosing excellent ITCs for entrusted management in the future. Third, managers are able to improve and adjust the allocation of internal organization's resources with an aim of realizing sustainable management.

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The remainder of this paper is organized as follows. Section 2 discusses related prior studies Section 3 introduces research design, including the sample selection criteria. Section 4 documents the empirical results and interpretations. Finally, Section 5 concludes this study.

2. Literature review

2.1. Performance evaluation of financial institutions

In the literature, the concept of efficiency in financial institutions has been extensively discussed. Among frontier analysis method, DEA is one of the commonly used techniques (Berger & Humphrey, 1997; Liu, Lu, & Lin, 2013a, 2013b). To measure efficiency, most previous studies place emphasis on the production approach (Ferrier & Lovell, 1990; Sherman & Gold, 1985) or the intermediation approach (Haslem, Scheraga, & Bedingfield, 1999; Miller & Noulas, 1996). Previous studies that use DEA to investigate the relative efficiency of financial corporations are described as follows.

Sherman and Gold (1985) are among the first to apply the classical CCR model (Charnes, Cooper, & Rhodes, 1978), to evaluate the operating efficiencies of 14 branch offices of a savings bank. Their study has since invited a series of subsequent DEA studies on financial institutions. Rangan, Grabowski, Aly, and Pasurka (1988) introduce the two-stage contextual DEA method to measure the performance of banks. They conduct regression analysis after evaluating the efficiency of banks to explore the association between efficiency and bank characteristics.

The following three studies attempt to analyse efficiency changes over time. Elyasiani and Mehdiian (1990) evaluate the efficiency of 191 large U.S. banks and compare their production frontier between 1980 and 1985. Berg, Førsund, and Jansen (1992) and Berg, Førsund, Hjalmarsson, and Suominen (1993) apply the Malmquist index to explore banks' productivity growth in Norway and Nordic countries. Favero and Papi (1995) measure 174 Italian banks' performance using the two-stage contextual method and show that efficiency is best explained by productive specialization, size, and location. Thompson, Brinkmann, Dharmapala, Gonzalez-Lima, and Thrall (1997) introduce several assurance region (AR) concepts to the related banking study.

Kantor and Maital (1999) integrate DEA with activity-based accounting to measure the costs and performance of the 250 branches of a large Mideast bank. Soteriou and Zenios (1999) use three models in evaluating the efficiency of bank branches, namely operation, service quality, and profitability. Paradi and Schaffnit (2004) adopt the production and strategic models to evaluate the performance of a Canadian bank. Giokas (2008) evaluates the performance of the branches of a Greek bank in three dimensions: production, transaction, and intermediation.

Several studies (Liu & Lu, 2010; Lo & Lu, 2006, 2009; Luo, 2003; Premachandra et al., 2012; Seiford & Zhu, 1999; Wanke & Barros, 2014; Yang & Liu, 2012) also apply the two-stage process concept to evaluate the performance of financial corporations. In the studies of Luo (2003), Seiford and Zhu (1999), and Lo and Lu (2006), banking operation is separated into the profitability and marketability stages. Recently, there has been a spate of interest in the study of performance evaluation of financial institutions using an AED approach in the two-stage DEA model, applying Chen, Cook, Li, and Zhu (2009) and Cook et al. (2010). For example, Liu (2011) examine the performance of Taiwanese financial holding companies, while Premachandra et al. (2012) document the efficiency of U.S. mutual fund families. Wang, Huang, Wu, and Liu (2014) study the efficiency measures of the Chinese commercial banking system.

Overall, these studies reflect the methodological development of DEA. Although various studies have explored the two-stage

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