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Financial Holding Companies: Diversification and Performance
: The Case of Taiwan

Abstract

The financial services industry is undergoing global restructuring to become bigger and more sophisticated. This paper aims to explore the relationship between diversification strategy and efficiency of financial holding companies (FHCs) for a small open economy, Taiwan. We employ a two-stage production process including profitability and marketability performance using the method of data envelopment analysis (DEA). Our empirical result shows that: (i) Profitability efficiency of low-degreed diversifiers is greater than that of high-degreed ones; (ii) Concerning diversification type, the related diversifiers perform better in profitability model than the unrelated diversifiers; (iii) However, the unrelated diversifiers performs marginally better in marketability model than the related diversifiers. It is concluded that the relationship between diversification strategy and a FHC's performance is not only one-facet, it depends on degree or type of diversity as well as the perspectives from profitability or marketability efficiency.

1997                                                                2002

                              2000    12        2001    6


                      Financial Holding Company


                                                                2003    2    28




                                                one stop shopping




                                      synergy











                                                Ramanujam  &  Varadarajan,

1989    Hoskisson & Hitt, 1990    Datta, 1991

                                                          1999

—　　　　　　　　　Glass-Steagall Act

2001　　　　　　　　　　537

Datta

1991

| | |
|---|---|
| **Diversification**<br><br>.<br>. | **/**<br>**Performance/Efficiency**<br>.<br>. |

Thakor　1996

Saunders & Walter　1994

universal  banking

Datta    1991

degree of diversity                type of diversity                       mode of

diversity                                    diversify  status           Hirschmann  Index

（Hirschmann, 1964）    Entropy Index    Jacquemin & Berry, 1979

Rhoades,  1974

approach                                          （internal development）

mergers  and  acquisition                          Yip, 1982

accounting-based              market-based

ROA

ROE                      ROI

Berger    1993                                                    Data Envelopment

Analysis, DEA            DEA

units invariance

1              production  approach

Sherman  &  Gold,  1985;  Ferrier  &  Lovell,  1990        2

intermediation approach

Yue, 1992; Haslem et. al., 1999;

Chen & Ten 2000                                        91

（Seiford and Zhu, 1999）

(Assets)　　　　(Equity)　　　　(Employees)

(Revenue)　　　(Profit)

(Earnings Per Share, EPS)　　　(Total Market Value)　　(Stock Price)

DEA　　　　　　　　　Farrell　1957　　　　　　　　Charnes, Copper
& Rhodes　　CCR　　　, 1978

Decision Making Unit, DMU　　　　　　　CCR

Constant Returns to Scale, CRS　　Banker, Charnes & Cooper　　BCC

Variable Returns to Scale, VRS

DEA

1　　　　　　　　　　　　　0.736

0.531　　　　　　　　　　-0.184

(1)　　　　　　　　　Herfindahl　　Entropy

(2)　　　　　　　　　　Herfindahl　　Entropy

(1)

(2)

| . | | | Herfindahl | Entropy | Related | Unrelated |
|---|---|---|---|---|---|---|
| 01 | 0.987 | 0.084 | 0.153 | 0.333 | 0.111 | 0.222 |
| 02 | 1.000 | 0.158 | 0.006 | 0.022 | 0.000 | 0.020 |
| 03 | 0.884 | 0.209 | 0.691 | 1.249 | 0.456 | 0.793 |
| 04 | 0.954 | 0.259 | 0.452 | 0.893 | 0.326 | 0.567 |
| 05 | 0.473 | 0.400 | 0.436 | 0.703 | 0.013 | 0.691 |
| 06 | 0.677 | 0.454 | 0.049 | 0.117 | 0.000 | 0.117 |
| 07 | 0.503 | 0.420 | 0.391 | 0.754 | 0.085 | 0.666 |
| 08 | 0.525 | 0.487 | 0.283 | 0.521 | 0.121 | 0.400 |
| 09 | 0.547 | 0.577 | 0.413 | 0.604 | 0.000 | 0.604 |
| 10 | 0.978 | 1.000 | 0.197 | 0.421 | 0.261 | 0.160 |
| 11 | 0.659 | 0.738 | 0.591 | 1.107 | 0.425 | 0.682 |
| 12 | 0.477 | 1.000 | 0.466 | 0.659 | 0.000 | 0.659 |
| 13 | 0.640 | 0.644 | 0.475 | 0.769 | 0.126 | 0.642 |
| 14 | 1.000 | 1.000 | 0.319 | 0.499 | 0.000 | 0.499 |
| | | | | | | |
| | 0.736 | 0.531 | 0.352 | 0.618 | 0.137 | 0.480 |
| | 0.218 | 0.313 | 0.197 | 0.341 | 0.164 | 0.251 |

”Linking Diversification
Strategy to Profitability and Marketability Efficiency:　A Case for Financial Holding Companies
in　Taiwan”

Fourteenth Annual World Business Congress

　　Best Paper Award　　　　　　　　　　　　　　　　　　　　　　　　*Journal
of Transnational Management Development*　ABI / EconLit

1.　　　　"　　　　　　　　　　　　　　　　　　　　　　　　　—DEA　　　　"

　　　　　　.

2.　　　　"　　　　　　　　　　　　　　　　　　　　　　"

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Limburg
(EuroArab Management School)

7    14

1995        27
                16

1987

*Journal of Transnational Management Development*

**Linking Diversification Strategy to Performance:**

**A Case for Financial Holding Companies in Taiwan**

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# Linking Diversification Strategy to Performance:

# A Case for Financial Holding Companies in Taiwan

## Abstract

The financial services industry is undergoing global restructuring to become bigger and more sophisticated. This paper aims to explore the relationship between diversification strategy and performance of financial holding companies (FHCs) for a small open economy, Taiwan. We employ a two-stage production process including profitability and marketability performance using the method of data envelopment analysis (DEA). Our empirical result shows that: (i) Profitability efficiency of low-degreed diversifiers is greater than that of high-degreed ones; (ii) Concerning diversification type, the related diversifiers perform better in profitability model than the unrelated diversifiers; (iii) However, the unrelated diversifiers performs marginally better in marketability model than the related diversifiers. It is concluded that the relationship between diversification strategy and a FHC's performance is not only one-facet, it depends on degree or type of diversity as well as the perspectives from profitability or marketability efficiency.

# 1. Introduction

The financial services industry is undergoing global restructuring to become bigger and more sophisticated.   The advent of financial holding companies (FHC) in the late 20th century has opened up cross-industry operations.   This type of financial service institution has already become popular in the United States and Japan after the governments abolished the prohibition from expanding into various financial service activities for over sixty years[1].   Europe, on the other hand, has a long history of 'universal banking' where financial institutions offer a broad range of financial services.

More and more customers demand for an integrated market offering comprehensive service across lending, deposit-taking, underwriting, brokerage, trading, and portfolio management, which can be realized within one holding company.   The establishment of holding companies allows for resources-sharing and sales of various financial products, both of which can achieve efficient capital allocation and lower operating expenses.   Consumers, on the other hand, can enjoy the convenience of one-stop shopping.   While the benefits of financial holding companies are claimed globally, the crucial link between a holding company's cross-selling and performance remains virtually unexplored.

By putting various sectors of financial service providers under one roof of FHC, the goal of economies of scale and scope can be carried out.   Economies of scale reflect the savings that can be achieved through increased size, for example, to share infrastructure and computer system.   Economies of scope reflect increased business from offering many products in one easy-to-reach location.   Thakor (1996) suggests several reasons for this global consolidation in banking.   For purveyors of multiple financial services, one of the most important reasons is that the world of financial services is increasingly becoming a single market.   Both corporate and individual customers seek financial service companies that can leverage their capabilities to provide a comprehensive range of financial products.   Thus, mergers are simply viewed as a low-cost way to improve asset portfolio diversification for a financial company.

Through transferring unique organization skills or sharing key organizational resources, a diversified FHC can enhance shareholder value.   The value-creating process chain is illustrated in Figure 1.   From the perspective of product and customers, a FHC is allowed for cross-selling and

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[1] The government of the United States passed the Financial Services Modernization Act in 1999, known as the Gramm-Leach-Bliley Act, abolishing the Banking Law and the Glass-Steagall bill, which demands the separation of the activities of commercial banks, investment banks, and insurance companies.   In 1997 Japan reformed the Anti-Monopoly Law and passed the Financial System Reform Law and the Bank Holding Company Act.   The laws were implemented in 1998.

sales of various financial products, both of which promote company synergy.  For a FHC, the single customer relationship is easier to maintain, thus credibility and brand are easier to manage. Consumers, on the other hand, can enjoy the one-stop shopping convenience.  From a FHC's operational perspective, infrastructure-and-information-sharing nature of holding companies will save cost.  Therefore, a FHC will enjoy diversified and stable earnings from these numerous financial products and fruit higher margins and returns.  The value of a FHC is ultimately defined by the stock market.  The capital market or investors will focus on a FHC's earnings per share (EPS), stock price level and market value.  In this value-creating process, we call the flow from the operating perspective to financial perspective as the profitability stage, which emphasize on a FHC's profit generating ability.  The flow from the financial perspective to the capital market perspective is called the marketability stage, which focus on its market attractiveness or its ability to generate more market value.  This value-creating process is triggered by a FHC's product or business diversification.

[Insert Figure 1]

Referring to American and Japanese experiences of financial reform, Taiwan's government legislated and passed the Financial Holding Company Act in 2001, which created a regulatory framework for local financial institutions to merge or acquire cross-financial industry operations. The law enables the establishment of a holding company, which acts as a management umbrella, to invest in subsidiary institutions engaging in different types of financial services such as banking, insurance, securities, bills financing, and venture capital.  In other words, a financial holding company is a type of financial conglomerate that offers a wide variety of investment options within one entity.  The FHC framework in Taiwan is designed as no bidders and targets, but as a pure holding company developed in the direction of 'concentration of stocks, organizational consolidation, and multi-faceted management.'

It is expected that through economies of scale, multi-faceted marketing, and cost savings, Taiwan's financial institutions are able to increase their international competitiveness and profitability.  At the end of 2003, fourteen FHCs were established.  There are mainly three main bodies for these FHCs.  The categories and the companies are:  (i) banks as the main body:  Hua Nan, China Development, E.SUN, Mega, Taishin, Sinopac, Chinatrust and First; (ii) insurance as the main body:  Cathay, Fubon, and Shin Kong; (iii) securities as the main body:  Fuhwa, Waterland, and Jihsun.  Although the mushrooming of holding companies virtually guarantees an expansion in scope, it is worth asking if this expansion guarantees higher performance for a FHC?

The aim of this paper is to investigate the relationship between the diversification status of a

financial services provider and its performance, taking Taiwan's FHCs to carry out empirical study. The relationship between diversification and performance is one of the most extensively studied areas in the fields of industrial organization, strategic management and finance, however, very little can be concluded with certainty on the diversification-performance relationship (Datta et al., 1991). Topics on the performance of financial institute, especially the issue on efficiency, have drawn considerable attention from both academia as well as the banking industry. However, there are still several important banking issues less touched upon:

Firstly, since a FHC will potentially allow a company to be better than being just a sum-of-parts if benefits are achieved, there is a lack of an integrated perspective that treats financial service industry entities as a whole (Verweire, 1999). Secondly, studies on diversification in the financial services industry are scare and no empirical data is available under the global trends towards more integrated financial groups (DeLong, 2001). Datta et al. (1991) provides a systematically review of the empirical research on the diversification-performance relationship and suggests that industry specification should be considered. Thirdly, the market reaction or investors' valuation for the financial service industry is ignored. Most previous literatures on bank efficiency most addressed bank profitability efficiency which focus on activities (or inputs) generating more profit. Very little research pays attention on marketability efficiency which focuses on activities generating more market value (Luo, 2003).

In this article, we apply a non-parametric frontier method, namely, data envelopment analysis (DEA) with the sample of 14 FHCs in Taiwan. This article is different from that of earlier studies and contributes in following ways: First, we treat the provider of financial services as a whole, such as a FHC. Second, this paper proposes a crucial linkage which has been largely ignored in the financial service industry literature in the relationship between diversification and performance. Third, rather than pursuing diversification, the management of a FHC needs to lead real gains financially and keep attractiveness in the stock markets. While measuring a firm's performance, the use of accounting-based and market-based measurement are usually applied in the previous empirical analysis. Whereas accounting-based measures are historical in nature, market-based measure reflects the market's perception of future performance. A two-stage model measuring a FHC's profitability efficiency (using accounting-based measurement) and marketability efficiency (using market-based measurement) is introduced and applied to evaluate a FHC's overall performance.

There are four more sections aside from this introductory section. The next section provides the literature of bank efficiency and diversification. Section 3 introduces the estimation method

and data selection.  Section 4 presents the empirical results and analysis.  Finally, conclusion remarks are given in the last section.


## 2. Theoretical Background
### 2.1 FHC Profitability and Marketability Efficiency

Efficiency, for along period of time, has been an important topic in banking.  DEA is one of the common techniques used to measure bank efficiency.  Two different approaches – production and intermediation – are commonly used to model bank behavior.  The production approach measures outputs by the number of accounts and considers operating costs such as capital and labor as input.  The intermediation approach assumes that banks collect deposits and purchased funds and convert these financial assets into loans and investment[2].  Major journals, such as the *European Journal of Operations Research* (1997), the *Journal of Economics and Business* (1998), and *Management Science* (1999), have published special issues on banking efficiency using the DEA technique.  An international survey of 130 studies of efficiency performance of financial institutions is given by Berger and Humphery (1997).  However, several important banking issues are less discussed in the previous literature.

Researches on the banking industry, the insurance industry, and the security industry for a long time have been separately studied.  To our knowledge, there are rare literatures treat a financial service institution as a whole entity with an integrated perspective, if non-existence.  Verweire (1999) proposes that financial conglomeration has been prohibited in many countries for decades, is a possible reason.  The financial consolidation trend is relatively new because the main financial conglomerates were formed at the end of the 1980s and the early 1990s.  Another reason is that, because each of these financial service industries has its own characteristics, valuation techniques, and accounting systems, which makes comparisons more difficult.  Whereas FHCs are gradually becoming a new and dominant form in the global financial services industry, and the operating complication climbs with degree of their diversification, the efficiency issue of FHCs are worthy of our focus and efforts to study.

Furthermore, the previous literatures usually ignore investors' valuation or market reaction for the financial service industry while focusing on bank efficiency.  Both academia and practice implication generally agree that the synergy of product diversification (e.g. infrastructure and information-sharing) of holding companies will save costs and thus yields diversified earnings and

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[2] See Sherman and Gold (1985); Ferrier and Lovell (1990), Miller and Noulas (1996); and Halslem et al (1999) for details.

higher returns. However, while profit efficiency is important for a FHC, marketability is also crucial, because the existence of any corporation is for the maximization of its stockholders' wealth. The capital market or investors usually pay attention to a FHC's earnings per share (EPS), stock price level, and market value.

A number of studies have argued that a multi-factor performance measurement model should be used while measuring a company's performance (Bagozzi et al., 1982; Chkravarthy, 1986) because 'performance' is a complex phenomenon requiring more than a single criterion to characterize. Seiford and Zhu (1999) initially employ the DEA technique to propose a two-stage production process examining both the profitability and marketability efficiency of the top 55 U.S. commercial banks. Zhu (2000) employs this model in an application to Fortune 500 companies. Following their model, Luo (2003) takes a sample of 245 US large banks in his research. It is generally agreed that a FHC's performance should be measured by its' ability to generate profit. Furthermore, a FHC's value is ultimately assessed by the stock market from the investors' standpoint. To apply this two-stage process model measuring both profitability and marketability performance for FHCs would be very timely and interesting.

This study adopts Seiford and Zhu's (1999) two-stage transformation process to design two performance models: profitability performance and marketability performance. As shown in Figure 2, the profitability performance model (stage-1) measuring a FHC's ability to generate revenue and profit consists of three inputs (assets, equity, and employees) and two outputs (revenues and profits). The marketability performance model (stage-2) measuring a FHC's attractiveness in the stock market consists of two inputs (revenues and profits) and three outputs (earnings per share (EPS), market value, and stock price). Corresponding to the idea behind Figure 1, the two-stage process model introduced here can be ideally fitted into the FHC value-creating process after a FHC's diversification stage.

## 2.2 Diversification

The research on diversification-performance can be traced back to Chandler (1962). It was suggested that a successful firm will finally expand their operations by diversifying their product offerings. After four decades in the management studies, a firm's diversification is one of the most frequently discussed topics (Berry, 1974; Rhoade, 1974; Jacquemin and Berry, 1979; Rumelt, 1982; Palepu, 1985; Prahalad and Bettis, 1986; Lang and Stulz, 1994). However, as pointed out in Datta et al.'s (1991) review article, the relationship between diversity and performance is inconclusive.

While measuring a firm's diversification strategy, a managerial-meaningful index measuring diversification is needed, and this index must be properly constructed and easily computed (Palepu,

1982).  A number of researches have proposed or applied a number of measures on diversification. Take '*diversification degree*' for example, this concept can be defined from simple counts of the number of products to compute the weights of a firm's total product mix (the continuous measures). The Hefindahl index (Berry, 1974) and entropy measure (Jacquemin and Berry, 1979; Palepu, 1985) are pervasively performed especially in empirical studies, partly because these two indices can be computed by SIC (Standardized Industrial Classification) code which is typically a standard to identify industrial business.

Aside from diversification degree, the topics on 'related diversifiers versus unrelated diversifier' ('*diversification type*' in this study) is often discussed (Runelt, 1974; Bettis, 1981; LeCraw, 1984; Palepu, 1985; Varadarajan and Ramanujam, 1987).  Palepu (1985) indicates that the use of diversification indices that does not distinguish between related and unrelated diversification fails to measurement validity.  The concept of 'diversification type' was firstly proposed by Wrigley (1970) by defining the nature of relatedness among the various businesses operating within a firm's portfolio.  The primary researches propose that related diversification is associated with benefits stemming from potential synergistic benefits including economics of scale and scope (Salter and Weingold, 1979; Teece, 1980).  'Relatedness' can be defined either at the operating level (Runelt, 1974) or corporate level (Prahaland and Bettis, 1986).  However, these classification schemes lack consistent classification (Nathanson, 1985) and there is only limited application in terms of empirical research (Grant, 1988).  In this study, we follow Palepu's (1985) decomposition of the entropy index to identify related-unrelated diversifiers with computation of SIC code.

# 3. Estimation Method
## 3.1 Data Envelopment Analysis

Data Envelopment Analysis (DEA), firstly introduced by Charnes et al. (1978), is a non-parametric linear programming approach which can handle multiple control inputs and outputs. It was initially designed to investigate the relative efficiency of non-profit organizations and is now successfully applied in diverse settings such as hospitals, schools, courts, the U.S. Air Force, rate departments, banks, etc. (Seiford 1997; Gattoufi et al., 2004; Sueyoshi et al., 2004a, 2004b). Charens et al. (1994) collect an extensive discussion of efficiency models across a variety of industries.

We assume that the objective of each FHC is to minimize its inputs, keeping the output level constant in the CRS (constant returns-to-scale) / CCR (Charnes-Copper-Rhodes, 1978) model.

The technical efficiency of a $FHC_{jo}$ ($jo = 1, 2, \ldots, n$) can be computed as a solution to the following linear programming (LP) problem:

$$\min \theta_{jo} - \varepsilon \left( \sum_{i=1}^{m} s_i^- + \sum_{r=1}^{s} s_r^+ \right)$$

$$st.$$

$$\sum_{j=1}^{n} \lambda_j x_{ij} + s_i^- = \theta_{jo} x_{ijo}, \quad i = 1, K, m$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} - s_r^+ = y_{rjo}, \quad r = 1, K, s$$

$$\lambda_j, j = 1K \ n, s_i^-, s_r^+ \geq 0 \forall i \ and \ r, \theta_{jo} \ free.$$

$$\varepsilon \ is \ non\text{-}Archimedean \ infinitesimal,$$

(1)

where $x_{ij}$ and $y_{rj}$ are the amount of the $i^{th}$ input consumed and amount of the $r^{th}$ output produced by the $j^{th}$ FHC, respectively. The technical efficiency (TE) of $FHC_{jo}$ equals TE = $\theta_{jo}$. By varying the index '*jo*' over all FHCs, we will get the technical efficiency in each FHC. If TE = 1 and all input and output slacks, $s^-$ and $s^+$, are equal to zero, then $FHC_{jo}$ is technically efficient. If TE is smaller than 1, then $FHC_{jo}$ is technically inefficient[3].

## 3.2 Diversification Measure

This study uses the standard industrial classification (SIC) to compute both diversification degree and diversification type. The SIC classification is a well accepted classification system and is frequently used in the industrial organization research. And the data is readily available in the required form. In the following section, we use SIC classification codes to define the industry segments and industry groups.

SIC industries at the 2-digit level are treated as the industry groups; SIC industries at the 4-digit level are treated as the industry segment. Consider a FHC operating in *N* financial service industry segments. Let $P_i$ be the ratio of the sales in *i*th 4-digit segment to the total sales of the FHC. A refined Herfindahl index is defined as follows to make the index increase with increasing diversification (Jacquemin and Berry, 1979):

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[3] If the constraint, $\sum_{j=1}^{n} \lambda_j = 1$, is added into the LP problem in Equation (1), then the technology is said to exhibit variable returns to scale (VRS) / BCC (Banker-Charnes-Cooper, 1984) model. Under the condition of VRS will produce plural FHCs having a full efficient status (TE =1) because of our small sample size. We therefore adopt CCR model rather than BCC model to avoid a great number of the FHCs to lead on the frontier. Though similar results can also be found under VRS condition but will be suppressed in our analysis.

$$\text{Herfindahl} = 1 - \sum_{i=1}^{N} P_i^2 \tag{2}$$

The entropy measurement of total diversification degree is a weighted average of the shares of the segment. This index increases with increasing of diversity. The weight for each segment is the logarithm of its inverse of its share as shown below:

$$\text{Entropy Diversification} = \sum_{i=1}^{N} P_i \ln(\frac{1}{P_i}) \tag{3}$$

In order to further identify the direction of diversity, we define an industry group as a set of related segments. The standard industrial classification (SIC) is also used to define the related and unrelated financial services industries. Segments within a financial service industry group are deemed to be more related to one another than segments across groups. In this study, a FHC's financial services from the same 4-digit SIC industry segment are treated as related; services from different 4-digit SIC industry segments are defined as unrelated.

We let the $N$ segments (4-digit) if the FHC aggregates into $M$ group (2-digit) ($N \geq M$). Related diversification is defined as a FHC's operating in several segments within an industry group $j$, which can be written as

$$\text{Related Diversification} = \sum_{i \in j} P_i^j \ln(\frac{1}{P_i^j}) \tag{4}$$

where $P_i^j$ is the share of the segment $i$ of group $j$ in the total sales of a FHC. Furthermore, let $P^j$ be the ratio of the sales in $j$th 2-digit group to the total sales of the FHC. A FHC's unrelated diversification is defined as:

$$\text{Unrelated Diversification} = \sum_{j=1}^{M} P^j \ln(\frac{1}{P^j}) \tag{5}$$

The sum of the related and unrelated component equals to the total entropy diversification (See Palepu (1985) for detailed inferences).

### 3.3 Data

This paper uses a sample of 14 FHCs in Taiwan. At the end of 2003, there are 14 FHCs operating, we therefore include these FHCs into our investigation. The inputs and outputs data are extracted from the Taiwan Economic Journal (TEJ) data bank. The TEJ data bank is commonly deemed valid, reliable, and available to the public, and is widely used in academia. The output and input factors (eight financial measures) used in this study are defined as follows: (1) Assets

are the FHC's year-end total. (2) Equity is the sum of all capital stock, paid-in capital, and retained earnings at the FHC's year-end. (3) Employees are composed of all staff members in a FHC to keep operating normally. (4) Revenues (excluding excise taxes) include consolidated subsidiaries within a FHC. (5) Profits are after taxes, after extraordinary credits or charges, and after cumulative effects of accounting charges. (6) EPS for each company is the primary earnings per share that appear on the income statement. (7) Market values are obtained by multiplying the number of common shares outstanding by the price per common share as the year end. (8) Stock prices are the prices per common share as the year end.

Table 1 presents the brief descriptive statistics for our data set. Since the DEA technique presumes the existence of a relationship among inputs and outputs data, a correlation analysis is therefore performed in Table 2. The correlation coefficients between the selected three input factors and two output factors are positive in the profitability model. These input and output factors hold an isotonical relationship, and therefore they can be included within one model. Similar positive correlation results can also be observed in marketability model taking into two inputs and three outputs. While using the DEA model, the number of FHCs should be at least twice of the total number of input and output factors considered (Golany et al., 1989). In this study the number of FHCs is fourteen, at least twice the selected five factors for the profitability/marketability performance model. In summary, the developed DEA model in this study holds high construct validity.

[Insert Table 1 and Table 2]


## 4. Empirical Results

Both profitability and marketability models in this study are run under the assumption of input minimization (also known as input orientation) on the basis of the controllable aspect from a manager's perspective. The profitability/marketability efficiency scores as well as degree/type of diversification are reported in Tables 3. The best performers achieve a score of 1.000 in the table. The mean score of profitability and marketability are 0.736 and 0.531, respectively. The correlation coefficient between the scores of profitability and marketability is -0.184, which implies that relatively high profitable FHC does not necessarily go with good marketable attractiveness. This relationship is contradicted to our intuition that higher profit leads to higher attention in the market, and more discussions on this will be presented. Section 4.1 and 4.2 link these efficiency scores to the behavior of the diversification indices.

[Insert Table 3]

## 4.1 Profitability/Marketability Efficiency and Diversification Degree

To investigate the relationship between efficiency and diversification degree, we firstly split the sample into two equal groups on the basis of the level of Herfindahl and entropy diversification indices, respectively.   To determine whether differences exist in the degree of diversification for profitability/marketability performance models, a graphic analysis is used.   A non-parametric statistical test, e.g. Mann-Whitney test, is not used because of our small sample size (See Brockett and Golany (1996)'s research).

From Figure 3, one can observe that the average profitability efficiency of low-degreed diversifiers is greater than that of high-degreed diversifiers both for Herfindahl and entropy diversification indices.   The evidence does support the notion that high total diversification is negatively associated with profitability, and this result is consistent to the previous literature (Palepu, 1985; Datta et al., 1991; Lang and Stulz, 1994).   This phenomenon can be interpreted that as a financial holding company, activities become more complex due to the providence of various financial products.   The diversified FHCs need to take time and efforts on transferring skills from one business to another, promoting resources-sharing values to staffs, and adjusting cultural conflicts across subsidies.   Profitability thus goes down in the early period while establishing the conglomeration.

When it comes to marketability efficiency, the two diversification measures produce conflict results:   The low-diversified group performs inferior to the high-diversified group while the measurement is based on Herfindahl index.   However, these low-degreed diversifiers perform slightly better than the high-degreed ones when using entropy index.   This result appears that more works need to be done, such as the decomposition on degree of diversification to clear up the relationship between a FHC's diversification and its marketability efficiency.

[Insert Figure 3]

## 4.2 Profitability/Marketability Efficiency and Diversification Type

For further investigations, FHCs are split into groups of 'predominantly related diversifiers' and 'predominantly unrelated diversifiers.'   Fourteen FHCs in our sample are divided into four groups.   FHCs with above median related diversification and below median unrelated diversification are classified as 'predominantly related diversifiers.'   FHCs with below median related diversification and above median unrelated diversification are marked as 'predominantly unrelated diversifiers.'   These two groups consist of four FHCs each.   (The FHCs with both related and unrelated diversification below median are non-diversifiers.   The FHCs with both

related and unrelated diversification above median are neither predominantly related diversifiers nor predominantly unrelated diversifiers. FHCs belong to these two types are omitted for further analyses.)

A cross-tabulation is presented in Figure 4 to illustrate a FHC's relative position on related-unrelated diversification and the interaction with profitability/marketability efficiency score. Fourteen FHCs fall into four quadrants following the above classification rule. Compared to unrelated diversifiers, related diversifiers result in superior performance in profitability efficiency: The group mean of related diversifiers is 0.861, which is higher than that (0.500) of unrelated diversifiers. The rational for this empirical result is that whereas diversified FHCs can transfer skills from one business to another and promote resources-allocation-and-sharing merits, related diversification seems to have a better chance to accomplish this as suggested by Rumelt (1982) and Salter and Weinhold (1979). Firms pursuing related diversification may also realize economic benefits from the exploitation of interrelationships between divisions based on functional specialization such as production, marketing, and purchasing (Porter, 1985; Teece, 1982).

On the other side, the group mean of marketability for predominantly related diversifiers is 0.599, which is marginally greater than that (0.458) of predominantly unrelated group. The possible managerial interpretation can be found from the perspective of investors. Since the term 'FHCs' is fresh new to investors in Taiwan, which is comparatively a small economy, any good news in earnings will excite the financial market considerably. Investors react to earnings with greater altitude for those FHCs with various business-line or financial products (predominantly unrelated-diversification) than related-diversified FHCs, even though these predominantly unrelated diversifiers may perform inferior in profitability efficiency. This phenomenon shows that from the standpoint of investors, they are willing to put more emphasis on the synergy effect for a FHC which expands its business in the direction of multiple-development, or a 'warehouse-sale' strategy.

[Insert Figure 4]


## 5. Conclusions

Diversification does not guarantee a successful path to higher performance, and the financial service industry is no exception. As FHCs and their customers enjoy the benefits of cross-selling, these FHCs are facing various markets, operational risks, and integrating difficulties. Although the global trend of the financial conglomeration has opened up a new battle field in cross-industry business, there are still some important issues less touched upon in the previous literatures: First, the ignorance to treat the provider of financial services as a whole, such as a FHC. Second, the

relationship between diversification and performance lacks investigation under the global conglomeration trend.    Third, an evaluation model based both on accounting and market basis concerning the value-creating process of a financial-services provider.    This paper therefore aims to measure the degree/type diversification for the FHCs in Taiwan, and relates to their profitability/marketability efficiency.

A two-stage model using DEA techniques for FHCs' efficiency is applied to study the FHCs in Taiwan.    Our findings can briefly be concluded as follows:    Firstly, profitability efficiency of low-degreed diversifier is greater than that of high-degreed ones in terms of diversification degree. This result is consistent with the previous literature while applying in other industries.    That more diversified FHCs appear to perform poorly indicates that the rising complex of activities erode the profitability efficiency in the initial stage.    Secondly, the related diversifiers perform better in profitability model than the unrelated diversifiers.    This suggests that FHCs that diversify into similar activities can use same of their existing skills and hence might have a comparative advantage in these activities, whereas FHCs that diversify into unrelated activities might not have such an advantage and hence might perform poorly.    Thirdly, the group of unrelated diversifiers performs marginally better in marketability model than the group of unrelated diversifiers.    This result indicates that investors in the financial market are willing to put more emphasis on a FHC with diversification strategy on multiple product line.    In summary, we find that the relationship between diversification strategy and a FHC's performance is not only one-facet, it depends on degree or type of diversity as well as the perspectives from profitability or marketability efficiency.

Any news in profitability of FHCs can excite investors in the stock market, especially for those FHCs with unrelated-diversification.    However, better marketability does not necessarily mean higher profitability.    The findings in this study can be explained by the reflection of the investors' subjective opinion that 'good news in earnings, no matter how tiny, means that a successful synergy is accomplished by mergers across financial industries, especially for "all-we-can-sell" ones.' These ones may perform inferiorly on profitability efficiency in reality.    Back to the base point, both profitability and marketability efficiency are the keys for a FHC's successfulness and healthiness.

Although the history of FHCs in Taiwan is quite short compared with other industrialized countries, this issue on the field of service industry cannot be ignored under the global financial trend.    This article can serve as a spur in the financial service industry for coping with the diversification issues relating to the performance of financial holding companies.    Time series data is not included, because the history of FHCs in Taiwan is really short, therefore, a further investigation would be the examination of performance over time (panel data) in due course.    The

models and methods used in this study are hoped to bring about other related researches.

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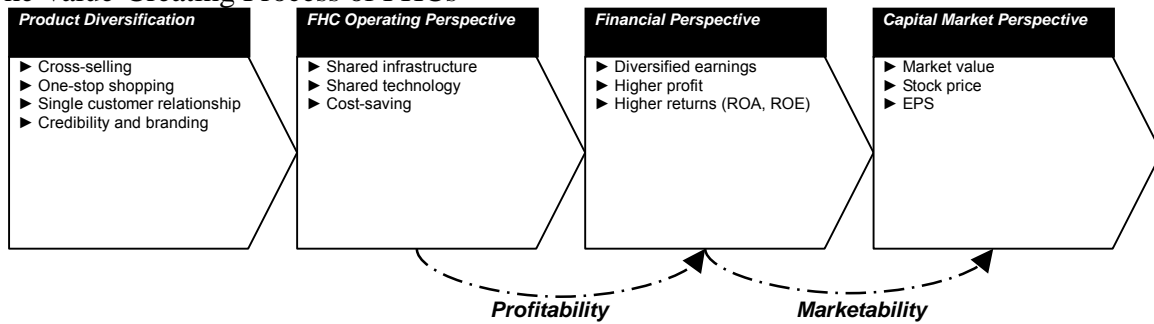
**Figure 1.**
The Value-Creating Process of FHCs



| Product Diversification | FHC Operating Perspective | Financial Perspective | Capital Market Perspective |
|---|---|---|---|
| ► Cross-selling<br>► One-stop shopping<br>► Single customer relationship<br>► Credibility and branding | ► Shared infrastructure<br>► Shared technology<br>► Cost-saving | ► Diversified earnings<br>► Higher profit<br>► Higher returns (ROA, ROE) | ► Market value<br>► Stock price<br>► EPS |

*Profitability*          *Marketability*

**Figure 2.**
Profitability and Marketability Efficiency Models for FHCs
(Adopt and modified from Seiford and Zhu, 1999)



Value-Creating Process of FHC

Assets
Equity
Employees

Profitability

Revenue
Profit

Marketability

EPS
Market Value
Stock Price

Stage-1
Profitability Performance

Stage-2
Marketability Performance
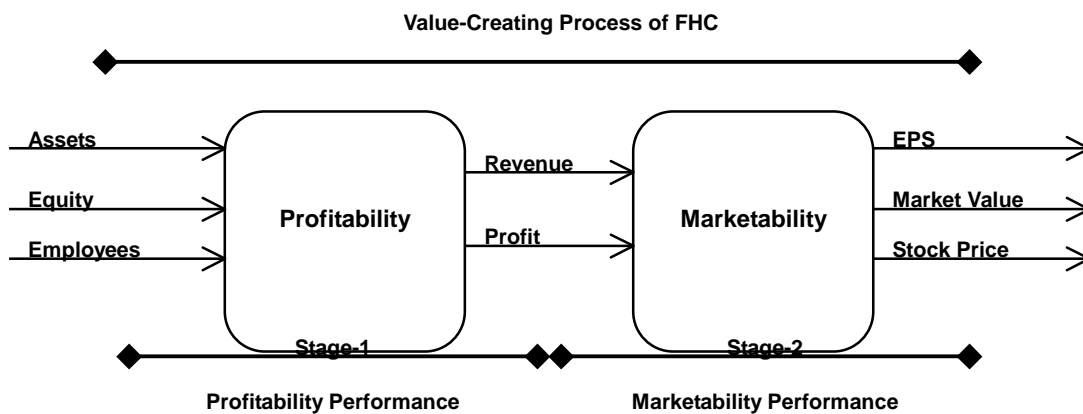
**Figure 3.**
Diversification Degree versus Profitability / Marketability Efficiency

**Diversification (Herfindahl)**
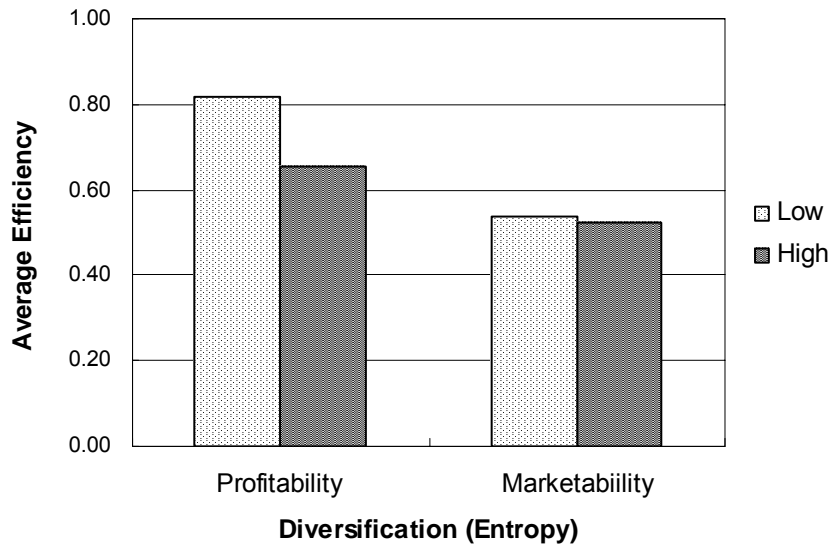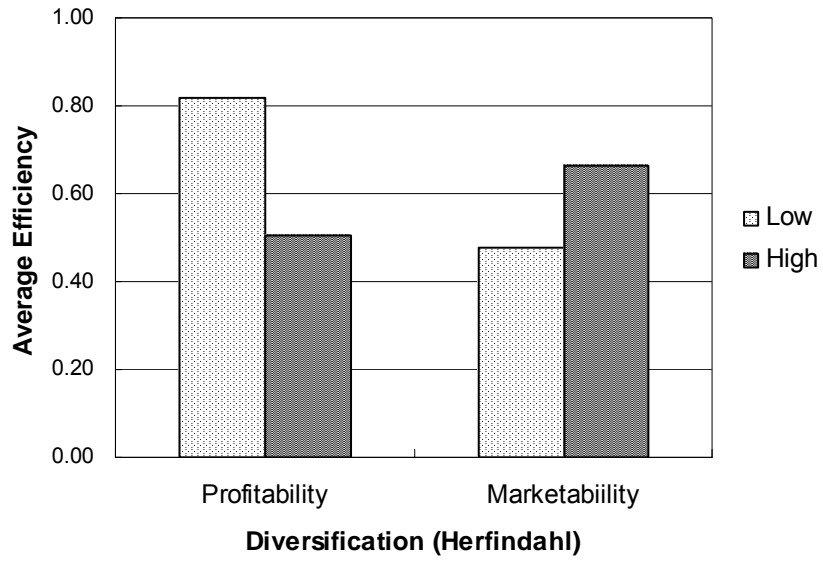


**Diversification (Entropy)**

**Figure 4.**
Related-Unrelated Dimensions and Profitability-Marketability Efficiency for FHC
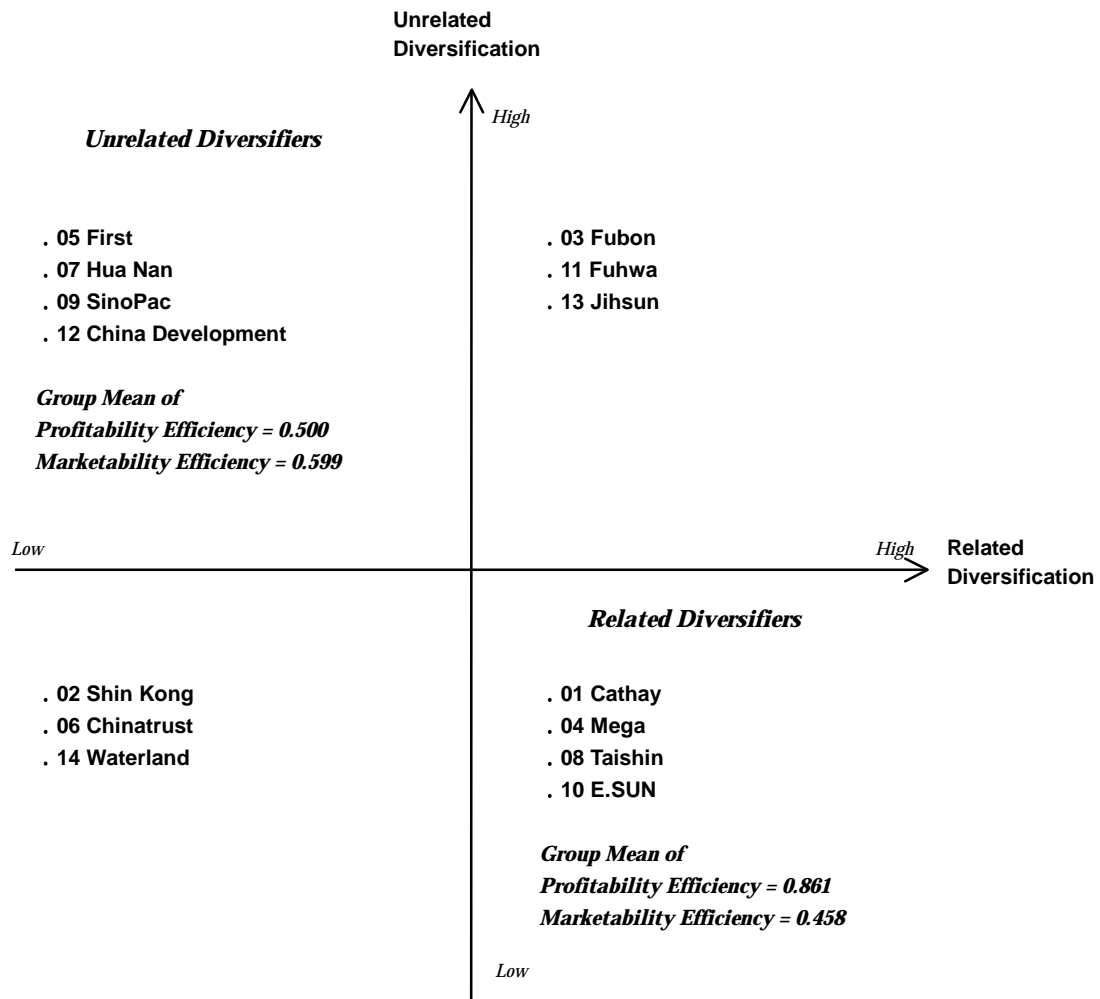
**Table 1**
Descriptive Statistics for the 14 FHCs in Taiwan

|  | Mean | Std. Dev. |
|---|---|---|
| Assets (NT$100 million) | 9007.31 | 6875.79 |
| Equity (NT$100 million) | 742.39 | 482.54 |
| Employees | 8308.50 | 8087.78 |
| Revenues (NT$100 million) | 911.13 | 1371.14 |
| Profits (NT$100 million) | 50.67 | 96.80 |
| EPS (NT$) | 1.07 | 1.38 |
| Market Value (NT$100 million) | 1343.66 | 1157.06 |
| Stock Price (NT$) | 22.64 | 11.19 |

**Table 2.**
Correlation Coefficients among Inputs and Outputs

|  | Assets | Equity | Employees | Revenues | Profits | EPS | Market Value | Stock Price |
|---|---|---|---|---|---|---|---|---|
| Assets | 1.0000 |  |  |  |  |  |  |  |
| Equity | 0.7276 | 1.0000 |  |  |  |  |  |  |
| Employees | 0.7641 | 0.4531 | 1.0000 |  |  |  |  |  |
| Revenues | 0.7037 | 0.4573 | 0.9784 | 1.0000 |  |  |  |  |
| Profits | 0.5600 | 0.4339 | 0.5413 | 0.5432 | 1.0000 |  |  |  |
| EPS | 0.2163 | 0.0700 | 0.3684 | 0.3913 | 0.8645 | 1.0000 |  |  |
| Market Value | 0.8230 | 0.9079 | 0.7475 | 0.7500 | 0.4999 | 0.1813 | 1.0000 |  |
| Stock Price | 0.8141 | 0.6269 | 0.8469 | 0.8110 | 0.5535 | 0.3870 | 0.8546 | 1.0000 |

**Table 3**
Efficiency and Diversification Scores of FHCs

|  |  | Efficiency | | Diversification | | | |
|---|---|---|---|---|---|---|---|
|  |  | | | Degree | | Type | |
| No. | FHC | Profitability | Marketability | Herfindahl | Entropy | Related | Unrelated |
| 01 | Cathay | 0.987 | 0.084 | 0.153 | 0.333 | 0.111 | 0.222 |
| 02 | Mega | 1.000 | 0.158 | 0.006 | 0.022 | 0.000 | 0.020 |
| 03 | First | 0.884 | 0.209 | 0.691 | 1.249 | 0.456 | 0.793 |

| No. | Name | | | | | | |
|-----|------|-------|-------|-------|-------|-------|-------|
| 04 | Hua Nan | 0.954 | 0.259 | 0.452 | 0.893 | 0.326 | 0.567 |
| 05 | Fubon | 0.473 | 0.400 | 0.436 | 0.703 | 0.013 | 0.691 |
| 06 | Chinatrust | 0.677 | 0.454 | 0.049 | 0.117 | 0.000 | 0.117 |
| 07 | Shin Kong | 0.503 | 0.420 | 0.391 | 0.754 | 0.085 | 0.666 |
| 08 | Taishin | 0.525 | 0.487 | 0.283 | 0.521 | 0.121 | 0.400 |
| 09 | SinoPac | 0.547 | 0.577 | 0.413 | 0.604 | 0.000 | 0.604 |
| 10 | E.SUN | 0.978 | 1.000 | 0.197 | 0.421 | 0.261 | 0.160 |
| 11 | Fuhwa | 0.659 | 0.738 | 0.591 | 1.107 | 0.425 | 0.682 |
| 12 | Jihsun | 0.477 | 1.000 | 0.466 | 0.659 | 0.000 | 0.659 |
| 13 | Chian Development | 0.640 | 0.644 | 0.475 | 0.769 | 0.126 | 0.642 |
| 14 | Waterland | 1.000 | 1.000 | 0.319 | 0.499 | 0.000 | 0.499 |
| | Mean | 0.736 | 0.531 | 0.352 | 0.618 | 0.137 | 0.480 |
| | Standard Deviation | 0.218 | 0.313 | 0.197 | 0.341 | 0.164 | 0.251 |

*Notes:* The order (No.) of the FHCs is coded by total assets.