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Research Paper

Measuring Management Performance of America's Coffee Franchise Using Service-profit Chain Analysis

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ABSTRACT: *This paper evaluated the management performance of coffee franchises in the U.S. incorporating operating efficiency (OE) and financial efficiency (FE) by the service-profit chain model, using data envelopment analysis (DEA). We found that there was a significant difference between OE and FE. That is to say, good management of resources does not mean that companies can use their profit to generate money. We further found company-owned ratio, firm size and advertisement were positively causal related to efficiency but the influence of advertisement was not significant. We also found that the global financial crisis influences financial efficiency but not operating efficiency.*

Keyword*: Service-profit chain, franchise, data envelopment analysis, operating efficiency, financial efficiency.*

I. INTRODUCTION

Franchise businesses are important to the overall economy. Take United States for example, sales from franchises accounts for more than 40% of all retail sales and franchising industry accounts for $1 trillion in annual retail sales for approximately 320,000 businesses in 75 industries [1]. It also represents 17% of the GDP of U.S., and in average 300 new franchise units start up every year. Franchising appears particularly among many types of small business services and this paper mainly focuses on coffee franchises in the U.S. According to the Coffee Research Organization (2009), coffee is the most popular beverage in the world with more than 400 billion cups consumed every year and American consumed the most in the world that Coffee's annual sales exceeding $18 billion. To accommodate this trend, numerous franchise opportunities exist for popular coffee shop and café businesses.

Because of its economic importance and its worldwide development, franchising has not surprisingly caught the attention of researchers from various fields such as marketing, entrepreneurship, economics, strategic management, the relative failure rates of franchising and plural form development [2] [3]. Scant literature focuses on franchising efficiency/performance or franchising performance using Data Envelopment Analysis. Therefore, in this paper we use the concept of efficiency.

However, we measure managerial efficiency in two ways: operating efficiency (OE) and financial efficiency (FE). These types of efficiency are respectively based on a two-stage service provision process that describes the two essential parts of coffee franchise operations, that is, outputs provided and profit generation [4]. We used the service-profit chain to incorporate two sub-processes with multidimensional efficiency into a DEA model to evaluate the level of management performance within coffee franchises in the USA. This method is different from traditional studies which have focused primarily on assessing operating efficiency [5] [6]. We also combined these two kinds of efficiency to constitute a performance portfolio of operations of coffee franchises. Amongst, management performance is no longer constrained with production efficiency but constitutes a broader dimension which covers not only operating activities but also financial outcome. Compared to the traditional single efficiency model, the sub-processes model is more suitable in evaluating the

management performance because of characteristics in the coffee franchise industry. This evaluating model is useful for both franchisers and franchisees even investors. For franchisers, it provides more detail performance evaluation process including two essential parts of operations in coffee franchise industry; for franchisees, it supplies a new strategy to select a franchise system via the performance in both side; for investors, it offers a complete measurement of efficiency and based on variable combinations of these two dimensions, investors could identify which company is really worthy to invest and make decision.

II. LITERATURE REVIEW AND RESEARCH METHOD

As to the related literature of efficiency evaluation on fast food restaurants chain, Reynolds and Thompson's [7] research justified the use of DEA logically and systematically in restaurant chains and analyzed the efficiency of 62 full service restaurant chains and identified that DEA offers considerable potential and advantages for managers seeking to accurately evaluate productivity. Reynolds and Biel [8] evaluate the performance from 36 same-brand units from certain restaurant chain with stores located in major metropolitan centers. Chen [9] divided the management performance into three sub-processes to measure operating efficiency (OE), marketing efficiency (ME) and financial efficiency (FE), and he proved that these three different efficiencies existed significant difference between one and another. Furthermore, Chen and Zhu [10] proposed "Value Chain DEA model" to estimate a two-stage production process by weighting two sub-processes simultaneously and they found that the efficiency scores of each sub-processes has obvious difference with each other.

III. RESEARCH METHODOLOGY

We employed service-profit chain to incorporate multidimensional efficiency into a DEA model to evaluate the level of management performance within American coffee franchise based on the framework of Heskett *et al.* [11]. These two types of efficiency are based on a two-stage service provision process that describes the two essential phases of coffee franchise operations: outputs provided and profit generation. We then followed the concept of Seiford and Zhu [12], dividing the entire production activity into two sub-production processes. Labor, capital, number of stores, advisement expenditure, and age of brand were original input variables, while total revenue, net income and the equity/assets ratio were final output variables. Medial input variables included franchising revenue, operating cash flow, and intangible assets.

We gathered the data from Franchise Disclosure Documents (FDD), formerly known as UFOCs, and other financial indices of a representative sample from the period 2005 to 2010. The UFOC/FDD was a response to some unethical behavior in the 1960's and 1970's. Today franchises are regulated by law. The Federal Trade Commission (FTC) requires that certain information be disclosed to potential franchisees before a contract can be signed or any payment made. The UFOC/FDD contains 23 items of information that must be current upon completion of the franchiser's most recent fiscal year. These 23 items include investment fee, trademarks, list of outlets, financial statement, and so on. If there is a material change to information in the document, the franchiser must revise the document (to be issued quarterly). Another limiting factor is that DEA cannot handle with negative data. Therefore, coffee franchises with negative data were excluded in this study and companies that failed to find the required data for the total five year period were also excluded. As a result, 24 coffee franchises were selected to cover the data requirements for the six-year period from 2005 to 2010.

Data Envelopment Analysis (DEA) is a method for measuring the performance efficiency of decision units, characterized by multiple input and output variables [5]. The method converts multiple inputs and output variables of a decision unit into a single measure of performance, regarded as relative efficiency. DEA includes two major models, the CCR model, and the BCC model. Charnes, Cooper and Rhodes [13] proposed a model under the assumption of constant return to scale (CRS), called the CCR model. This model is only appropriate when all DMUs are operating at an optimal scale. Banker, Charnes and Cooper [14] extended the CCR model to include the variable returns to scale named the BCC model, which can further decompose the TE into two components: scale efficiency (SE) and pure technical efficiency (PTE). The problem of calculating efficiency can be formulated as a fractional linear programming problem as below:

$$Max\ \mathrm{E}_j = \sum_{n=1}^{N} U_n Y_{jn} - u_0 \Big/ \sum_{m=1}^{M} V_m X_{jm}$$

$$s.t.\ \sum_{n=1}^{N} U_n Y_{jn} - u_0 \Big/ \sum_{m=1}^{M} V_m X_{jm} \le 1;\ \forall \mathrm{r}$$

$$\mathrm{U}_n,\ \mathrm{V}_m \ge 0\ \ \mathrm{m}=1,2,...,\mathrm{M};\ \mathrm{n}=1,2,...\mathrm{N};$$

$$r = 1, 2, ..., j, ...R$$

We utilized the BCC input-oriented model to measure phase I to find a minimum input with certain

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medial output. In contrast, we used the BCC output-oriented model to measure phase II to find maximum final output with certain medial input.

IV. EMPIRICAL ANALYSIS

We obtain the BCC efficient scores of operating efficiency and financial efficiency of the 24 coffee franchises for five evaluated years 2005 to 2010. The main goal of phase I was to evaluate how well companies use their resources to generate operating profit; the main goal of phase II was to evaluate how well companies use their operating profit to generate financial outcome. We found that the average operating efficiency scores from 2005 to 2010 were 0.8996, 0.9205, 0.914, 0.8938, 0.8558, and 0.9003 respectively; average financial efficiency scores from 2005 to 2010 are 0.9279, 0.9627, 0.921, 0.9582, 0.9567, and 0.9615, respectively. Besides, in these 24 coffee franchises, there were 9 and 5 companies that are categorized as operating efficient and financial efficient, respectively in 2010.

We used the Mann-Whitney U Test to find any significant difference between operating efficiency and financial efficiency before 2008 and after 2008. A significant difference between these two types of efficiency in the year 2008 proves that the financial tsunami has great influence on performance of the franchise industry. An interesting result was that the financial tsunami does not influence the OE, but influence the FE. We also performed the test to discover is there is a significant difference between OE and FE. We found the p-value of 0.005 to be less than the critical value of 0.05. Thus, we prove that there is a significant difference between OE and FE (see Table 1).

We further conducted Tobit regression model in order to determine whether the efficiency scores are related to some characteristics such as company-owned ratio, firm size and advertisement expenditure of the coffee franchises in US. The function of regression model should be $Y = a + bX$ where Y represents dependent variable and X represents independent variable. However, Tobit regression model transform the ordinary regression form to a logistic probability function since the efficiency ranges from zero to one. The transformed regression function is expressed as: $\ln(\frac{Y}{1-Y}) = a + bX$, is derived from: $Y = F(a + bX) = \frac{1}{1 + \exp(-a - bx)}$.

In the OE Model (M1), we find company-owned ratio (CR) and firm size (FS) all highly significant and positive which indicates that high CR and high FS can lead to higher operating efficiency through a higher level of operational management. These results support the previous findings such as Castrogiovanni, Justis and Julian [15], Combs and Ketchen [16], and Dant & Kaufmann [3]. We also find that Advertisement Expenditure is not has significant influence in this Model. Similar results can be found in FE Model (M2). Furthermore, we add a dummy variable for evaluate the influence of global financial tsunami in year 2008. Amongst, 1 represent the data after year 2008 and 0 represent the data before year 2008. We find that global financial tsunami has significant influence financial performance but not operating performance. The result is similar to that of M-W test since global financial crisis really has negative influence to financial efficiency (FE), rather than operating efficiency (OE) (see Table 2).

Table 1 Results of Mann – Whitney U Test

	OE	**FE**	**OEvsFE**
Mann-Whitney U Test	2648.5	1914	5725.5
Wilcoxon W Test	5176.5	4542	12985.5
Z Test	-0.176	-2.751	-2.798
p-value	0.86	0.006**	0.005**

Note. Source from this study. ** represents significant at 0.05 level.

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Table 2 Estimated Results of the Tobit Regression Analysis

Model	**M1**	**M2**
Dep. Var.	OE	FE
Indep. Var. Intercept	14.413	7.996
	2.006**	1.170
Company-Owned Ratio	0.529	0.741
	2.284**	6.172**
Firm Size	0.624	0.889
	3.492**	5.247**
Advertisement Expenditure	0.174	0.341
	0.901	0.773
CR*FS	-0.98	-0.677
	-4.240**	-2.979**
Dummy (Global Financial Tsunami)	-0.12	-0.148
	-0.156	-2.015**
Adj. R^2	0.157	0.184
F-value	6.314	7.464
P-value	0.000**	0.000**

Notes: Indep. Var. = independent variables; Dep. Var = dependent variable, here is the efficiency scores derived from operating efficiency and financial efficiency, respectively. The first row is the coefficient of the parameter, the second row is the t-value of the coefficient. The observation is 24. ** represents significant at 0.05 level and * represents significant at 0.1 level

V. CONCLUSION

Our first finding is that there indeed is a significant difference between operating efficiency and financial efficiency. Thus, we better use these sub-processes DEA model to measure the management performance because of the characteristic of the productive activities in franchise industry [9]. Operating efficiency is concerned with minimizing input and improving operational margins; financial efficiency is how efficiently firms can use profit to generate money. It's a two stages process of productive activities in franchise industry represent outputs provided and profit generation, respectively [4].

Our second finding is that company-owned ratio indeed has significant and positive influence on operating efficiency and financial efficiency within franchising. Our results confirm that the benefit of company-owned chains owns better service quality and product consistency [17]. It explained why firms use franchising for their growth and several scholars argued that mature and successful franchisers desired to have full ownership of the entire franchising system by purchasing back franchised units [17]. Besides, because of limited in resources, franchising is important in initial period of operation. Large networks of the franchise system can bring economies of scale, brand name recognition, and market power; the cost per unit becomes lower and savings are from purchasing, promotion, R&D, monitoring, quality control, advertising and product development [18] [3].

Our third finding is that firm size has positively significant influence on not only operating performance but also financial performance.

In our fourth finding, we find that advertisement expenditure is positively related to operating performance and financial performance but not statistically significant. Advertising acts a very important role on firm's performance [19]. We had expected that advertising expenditures would influence the performance but this result does not necessarily indicate that franchisers do not have to provide advertising services to be successful. This lack of significance may be the result of the fact that most franchisers offer a huge amount of advertising cost to attract franchisees [20]. Hence, even though there is no significant relationship between the performance and advertising, we would counsel the franchisers to continue to keep at least basic levels of advertising.

Our fifth finding is that the global financial tsunami influences financial efficiency but not operating efficiency. It is not surprising because global financial tsunami largely reduced consumer's consumption, and influenced the financial perspective directly in every industry and even all over the world [21]. Facing the huge financial pressure, the firms may carefully in their operating process to avoid any unnecessary waste. Their goal on operating activity is concerned with minimizing input and improving operational margins and not directly

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influence by global financial crisis [11]. Because the shocks were unpredictable and large in magnitude, it was a good timing for measuring the impact of firm productivity and other performance.

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