EQUITY VALUATION MODELS FOR RESTAURANT INDUSTRY

by

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ABSTRACT

The U.S. restaurant industry has been significantly impacted by the 2008 financial crisis, and the phenomenon of undervalued restaurant stocks has attracted attention. The undervaluation of restaurant stock was consistently addressed by restaurant CEOs and financial analysts, since late 1990s. Nevertheless, there has been little research on how analysts value restaurant stocks. Therefore, the purpose of this study was to examine the existing valuation models used to value restaurant stocks and determine which ones are more effective.

A non-experimental quantitative research design was employed, to compare the valuation errors of each valuation model. This study included 50 restaurant companies All of the financial data, including historical and forecasted data, were collected from 2005 to 2012, using the Bloomberg and FactSet databases.

First of all, this study compared the present value models and multiples valuation models, based on valuation accuracy and performance of valuation models. Overall, multiples valuation models estimated stock values more accurately and provided more accurate predictions than the residual income model. Second, this study extended the analysis of multiples valuation models, by comparing four different multiples. The four multiples were, the P/E, forecasted P/E, the EBITDA, and Book value multiple. The EBITDA multiple yielded more accurate predictions and performed better than other multiples. Lastly, this study

discussed the undervaluation of restaurant stocks. More than 53 percent of estimations based on valuation models were undervalued, especially the estimations by the residual income model and the forecasted P/E multiple were more undervalued than by other valuation models. Both models predominantly used the forecasted P/E, estimated by Bloomberg analysts. This finding indicated that analysts tend to underestimate restaurant stocks.

This study will help to fill the gap in stock valuation research in restaurant industry. Furthermore, by suggesting the EBITDA multiples valuation as an effective valuation model, this study can assist investors to build their investment strategy in the restaurant market. This study also encourages analysts to be aware of the undervaluation of restaurant stocks.

Keywords: Valuation Model, Restaurant Industry, Undervaluation, Residual Income Model, Multiple Valuation Model

Chapter 1

INTRODUCTION

1.1 Background

1.1.1 Overview of the Restaurant Industry

The U.S. restaurant industry has seen continuous growth for the past two decades (Barber et al., 2011; Kim et al., 2009). In 2012, U.S. restaurant industry sales are expected to reach $631.8 billion, a 3.5 percent increase on 2011 sales, and the second consecutive year that industry sales will top the $600 billion level (National Restaurant Association, 2012). Although the real growth rates in 2012 (0.8 percent) are expected to be below the gains in 2011 (1.3 percent), U.S. restaurant industry growth is going to remain positive (National Restaurant Association, 2012).

The U.S. restaurant industry has been a strong contributor to the recovery of the nation's economy. As the nation's second-largest private sector employer, the restaurant industry will employ 12.9 million individuals in 2012, representing 10 percent of the U.S. workforce (National Restaurant Association, 2012). In addition, while total U.S employment grew at a one percent rate in 2011, the restaurant industry added jobs at a rate of 1.9 percent in 2011 (National Restaurant Association, 2012). Combined with the fact that job growth in the restaurant industry outpaced the overall economy for the 12th straight year in 2011, the National Restaurant Association stated that "the restaurant industry is an

engine of job growth for the U.S. Economy, even when many other industries are shedding jobs" (National Restaurant Association, 2012).

Compared to the U.S. restaurant industry, the global restaurant sector is expected to decelerate in revenue growth during 2010–2015 (Datamonitor, 2011). In 2010, the global restaurant industry grew by 2.9 percent and had total revenues of $1,570 billion, representing a compound annual growth rate (CAGR) of 3.7 percent for 2006–2010 (Datamonitor, 2011). According to the market analysis conducted by Datamonitor (2011), the performance of the global restaurant industry is forecast to decelerate, with an anticipated CAGR of 3 percent for 2010–2015, and a total value of $1,821.8 billion by the end of 2015. A study carried out by Datamonitor (2011) indicated that factors, such as natural disasters, global recession or food borne illness might negatively affect global restaurant revenues. The U.S. restaurant industry was no exception, and was influenced by these same factors.

1.1.2 Challenges for the U.S. Restaurant Industry

Although the U.S. restaurant industry is expected to grow in 2012, there are several challenges for the restaurant industry: the state of the economy, energy prices and food prices. First, the economic recovery remains, overall, unsteady. Since 2007, the real estate market has had a huge impact on the U.S. economy, leading to job losses in housing-related sectors, reducing overall wealth for Americans, lowering the rate of mortgage-equity withdrawal and tightening the availability of credit. According to the National Household Survey in 2011, 92 percent of adults described the current state of the economy as either "fair" or

"poor." When asked the same question in 2010, 92 percent of adults also gave the same assessment of the economy (National Restaurant Association, 2012). These responses underscored the fact that the majority of U.S. consumers will continue to cut back their spending on eating out in restaurants.

Second, increasing energy prices since 2007 have posed challenges to the restaurant industry. Energy prices are regarded as important indicators for the restaurant industry, because they impact on both consumer demand and the operation of businesses (National Restaurant Association, 2012). According to the National Restaurant Association (2012), the U.S. Energy Information Administration (EIA) found that both electricity and natural gas prices are expected to increase in 2012. This circumstance will continue to put pressure on cash-strapped consumers and restaurant owners (National Restaurant Association, 2012). Moreover, rising energy costs were one of main factors affecting wholesale food costs and menu prices in 2007 and 2008 (National Restaurant Association, 2008).

Lastly, fluctuations in food costs have became one of the most serious challenges for the restaurant industry, because food prices have a significant impact on a restaurant's bottom line. According to the National Restaurant Association (2012), wholesale food prices are expected to have a higher rate of increase than ever before, posting their strongest annual increase in more than three decades. Wholesale food costs were increased by 7.4 percent in 2007, which represents the highest spike in wholesale food prices in the past 27 years (National Restaurant Association, 2008). In 2011, food prices jumped 8.0 percent, which

marked the third time in the last five years (National Restaurant Association, 2012).

In addition to the challenging economic environment, operating a restaurant business successfully is not an easy prospect. Approximately 50 percent of new restaurants fail during the first year of operation, and 85 percent go into bankruptcy after three years (Angelo & Vladimir, 1998). According to Parsa et al. (2005), a relatively modest 26.16 percent of independent restaurants fail during the first year of operation. They found that the three-year, 1996–1999, cumulative restaurant failure rate for franchised chains was 57.22 percent, and 61.36 percent for independent restaurants.

These restaurant bankruptcies are also well represented in recent publications. Nation's Restaurant News (2011) reported that Chapter 11 bankruptcy filings in the restaurant industry were due to the economy, the stock market crash and restaurant chains debts. It mentioned that these bankruptcies resulted from the pressures of increased commodity costs, which forced many restaurant chains to raise menu prices in 2011. This resulted in slowed consumer spending, increased commodity costs and continued debt pressure for many companies (Nation's Restaurant News, 2011). The Wall Street Journal (2008) also reported that many large restaurant chains would expand slowly, while there would be a greater number of bankruptcies of small restaurants in 2008 and 2009.

1.1.3 Undervalued Restaurant Stocks

Following the financial crisis in 2008, the phenomenon of undervalued restaurant stock has been a huge problem (Nation's Restaurant News, 2010). This

phenomenon did not suddenly appear in 2008. It has been claimed that since the late 1990s, restaurant stocks were consistently undervalued by the market. To give a specific example, a group of Uno Restaurant Corp. executives announced that the company had tried to divorce itself from the public market because of Wall Street's continuing lack of interest in midcap restaurant stocks (Nation's Restaurant News, 2000). In March 1999, the Chairman and CEO of Landry's Seafood Restaurants Inc., Tilman J. Fertitta, bought the company's stock to demonstrate to shareholders his continued commitment to the company, and his belief that his stock is undervalued (Wall Street Journal, 1999). In 1998, analyst Mark Sheridan of New Orleans-based Johnson Rice and Jeffrey Omohundro of Wheat First Union in Richmond raised their rating of Cracker Barrel to a "buy" from a "hold", because they believed that the stock was undervalued (Wall Street Journal, 1998). For similar reasons, on January 8 1998, Warren Buffet's holding company, Berkshire Hathaway Inc., bought International Dairy Queen for $585 million (Nation's Restaurant News, 1997). This action prompted lots of attention from investors, because Buffet has built up a reputation for picking companies the rest of Wall Street has overlooked and undervalued (Nation's Restaurant News, 1997).

The undervaluation of restaurant stock has also been addressed by several hospitality researchers (Madanoglu et al., 2006; Madonoglu & Karadag, 2009). The study by Madanoglu and Karadag (2009) addressed the concerns of executives of publicly traded restaurant companies who believed that their stocks were not properly estimated by equity analysts, and were consistently undervalued by the capital markets. For instance, Terry Smith, the chief executive of

Tumbleweed, Inc., was concerned that his company's stock was undervalued and thinly traded, which forced Tumbleweed to raise all its funds through banks and financial institutions (Madanoglu & Karadag, 2009).

According to Barber et al. (2011) and Lee and Upneja (2007), the phenomenon of undervaluation of stocks could be caused by the inefficiencies of the market and asymmetric information, such as lack of understanding of the restaurant market. Furthermore, economic issues, such as rising commodity and oil prices, and increased competition, can influence restaurant stock valuation (Barber et al., 2011; Nation's Restaurant News, 2010). For example, Steve Rockwell, a restaurant analyst, finance executive and investor, observed that the recent U.S. financial crisis has stimulated a depression in equity valuations leading to a decline in restaurant stock prices (Nation's Restaurant News, 2010). For instance, Bloomberg Businessweek listed the stock of Dean Foods, an American food and beverage company, as one of most undervalued 25 stocks in 2009. According to Ben Steverman, a reporter for Bloomberg News, rising prices in the commodities market, especially of raw milk, made Dean Foods more vulnerable, particularly as it suffered from high debt load (Bloomberg Businessweek, 2009).

Before the recent financial crisis, many investors used to believe that financial engineering would create additional shareholder wealth, and restaurant management teams implemented new financial strategies with readily available capital. This resulted in companies having highly leveraged balance sheets, and this caused severe difficulties during the economic crisis when sales and cash flows declined precipitously (Nation's Restaurant News, 2010). According to Steve Rockwell, raising new equity was not an option for many companies, and

management teams were forced to change their strategies, focusing on cash flow and how to meet bank covenants instead of focusing on earnings and new restaurant growth (Nation's Restaurant News, 2010).

1.2 Statement of Problem

Due to the recent steady growth in the restaurant industry, it is likely that more investors will be attracted to the industry and will be willing to invest in restaurant stocks. Since the late 1990s, several restaurant executives and market analysts have argued for the phenomenon of restaurant stock undervaluation. Both groups have attributed this phenomenon to a lack of the understanding of the restaurant industry by the markets.

If restaurant companies are systematically underpriced, this might cause additional problems for the restaurant industry. Investors may overreact during trading, resulting that the market price might not reflect the value of restaurant companies fairly. Moreover, the restaurant companies will potentially be in a weaker competitive position, because they will find it hard to obtain credit and financing (Nation's Restaurant News, 2010).

In spite of the interest surrounding undervalued restaurant stocks, there is little research on how analysts value restaurant stocks. There are only a few studies that discuss the stock valuation models in lodging companies, and there are even fewer studies focusing on restaurant or food-service companies (Upneja & Lee, 2005; Hua & Upneja, 2006; Lee & Upneja, 2007; Barber et al., 2011). Several researchers in mainstream finance and accounting excluded hospitality firms, or included them within the service sector in their research studies on this

topic (Upneja & Lee, 2005). However, the restaurant industry has different characteristics from other elements of the service industry. Therefore, it is hard to justify the application of the same valuation methods to restaurant stocks. Furthermore, very few previous studies have focused on the performance of different multiples valuation models in the restaurant or hospitality industries.

From this perspective, finding valuable companies in the restaurant industry and using the proper financial tools to value them will be of great use for investors, analysts, and investment managers. A reliable financial tool for stock valuation is important because it will enhance the stock performance returns and help to achieve a fair return on investment (Barber et al., 2011; Menorca, 1992). Therefore, this study will help to fill a gap in the restaurant literature by evaluating different restaurant stock valuation models and recommending one that is most effective.

1.3 Purpose of the Study

The primary purpose of this study is to examine those existing valuation models that can more reliably value restaurant stocks. This study compares the existing valuation models based on valuation accuracy and the performance of the valuation models. More specifically, this study undertakes an analysis to determine whether the present value models or multiples valuation models estimated the stock prices more accurately. Moreover, this study also extends the analysis of multiples valuation models, by comparing the valuation accuracy of multiples based on the earnings of restaurant companies and multiples based on book value.

First, this study specifically focuses on how restaurant companies are valued: using stock valuation models. Contrary to other hospitality literature, which only compares the present valuation models – such as discounted cash flow and residual income methods – this study compares the present valuation models and the multiples valuation models, based on the accuracy and performance of their estimates. The comparison of these different valuation approaches provides some empirical evidence on the valuation of the restaurant market.

Second, this study extends its analysis to include the second valuation method: the multiples valuation model. This study selects common multiples for the restaurant industry and compares these multiples. By analyzing the accuracy and performance of these estimates, this study suggests the most effective and helpful multiples for the valuation of restaurant firms.

Lastly, this study discusses the undervaluation of restaurant stocks based on the findings derived from the comparison of valuation models. This study compares the distribution of valuation errors using the RIM and multiples valuation models, and presents the percentage of estimations that were undervalued. By providing evidence of undervaluation of restaurant stocks, these findings will also help to make this study more reliable.

The study is guided by the following research questions:

1) Which type of valuation model, the Residual Income Model (RIM) or multiples valuation model, estimated restaurant stocks more accurately, and performed well for this particular industry?
2) Which common multiples valued the restaurant stocks more precisely and provided more accurate estimations?

3) Are the restaurant stocks underestimated based on the stock valuation models?

1.4 Significance of the Study

Senior executives and managers are dedicated to maximizing their company's value for shareholder's, and to analyzing the most accurate and flexible methods for valuing their companies. However, not all valuation analyses are forecasted equally. Errors in estimating the corporate value can ultimately lead to strategic errors. An accurate valuation model can be useful in making such forecasts and in taking strategic decisions. For example, properly executed valuation analysis can help a company to understand mismatches between its performance and that of its competitors, and to hold decisions about whether it creates more value than other industry players (Goedhart et al., 2005).

As mentioned in the previous section, despite the significance of valuation models for the industry, very few studies have discussed the stock valuation models appropriate for restaurant or food-service companies. Compared to research in mainstream finance and accounting, there has been much less research of stock valuation models in relation to restaurants. This study will thus help to fill a gap in restaurant or hospitality research investigating stock valuation models, and will be of benefit not only to academic researchers, but also to practitioners, such as financial analysts and investors.

First, it examines the valuation accuracy and performance of valuation models within the restaurant industry. The results of this study will help researchers to choose an appropriate valuation model and multiples that minimize valuation errors, especially in the context of restaurant companies. In addition, this

study uses actual estimations, which were reported by Bloomberg analysts. To investigate the valuation accuracy, most studies, such as that of Kim and Ritter (1999) and Berkman et al. (2000), made use of ex-post value estimations by academics. However, according to Frankel and Lee (1998), the use of analysts' forecasts in predicting stock returns improved the prediction power, due to the contemporaneous stock prices used. The studies of Kim and Ritter (1998) and Liu et al. (2002) also proved that forward-looking multiples represented more accurate predictors of value. Therefore, by using analysts' forecast data, the valuation models of this study were able to make more accurate estimations. This study can thus suggest more effective valuation models for investors who are interested in restaurant companies.

Chapter 2

LITERATURE REVIEW

There are only a handful of studies that have discussed stock valuation models for lodging companies (Upneja & Lee, 2005; Hua & Upneja, 2006; Lee & Upneja, 2007). However, even fewer studies have researched the valuation models for restaurant companies (Barber et al., 2011). Various approaches and methods have been used in the past to estimate lodging or restaurant stocks.

Related to the income-generating capacity of hotels, Nilsson et al. (2001) investigated and compared four different income capitalization methods for hotel valuation: single capitalization rate (SCR) methodology, discounted cash flow (DCF) analysis, simultaneous valuation formula (SVF), and the band of investment method (BIM). Even though, each model had benefits and limitations, they found that the more sophisticated income-based income capitalization methods, such as the DCF model were more effective in estimating for hotel companies.

To demonstrate the undervaluation of lodging stocks, Lee and Upneja (2007) used the Residual Income valuation model and compared lodging stocks with stocks in other industries. They found that both lodging and non-lodging equity values were overvalued for the 1990s period. In other study, Lee and Upneja (2008) also compared two traditional valuation models for estimating lodging stocks – the capital asset pricing model and the Fama and French three-factor model – with the implied cost-of equity method. They found that using the

implied cost-of-equity model estimated the lodging firms more reliably than using the capital asset pricing model.

Barber et al. (2011) used a modern portfolio investment approach that estimated the equity value of ten restaurant companies. This study compared and valued two investment portfolios based on the discounted cash flow model and weighted average cost of capital model. They found that the positive return rates (5.6 percent) of the portfolio had 75 percent prediction accuracy.

2.1 Stock Valuation

The valuation of a firm is the method of analyzing information in current and past financial statements, and combining this with figures on other firms, with the industry as a whole, and with macroeconomic data to forecast future payoffs and ultimately estimates the firm's intrinsic value (Penman, 2004). Valuation models are useful in helping investors to identify mispriced stocks. They allow us to understand the determinants of a firm's market value, and facilitate investment decisions (Kothari, 2001).

In this study, two types of equity valuation model were summarized: present value models and multiples valuation models.

2.1.1 Present Value Models

Following the research conducted by Markowitz (1952), many academic researchers have developed and selected different methods to estimate a fair value for companies and their stocks. The dividend discount method (DDM),

the discounted cash flow (DCF) method, and the residual income model (RIM) are valuation methods commonly used by researchers (Palepu et al., 2000; Lee & Upeja, 2007). Each valuation method is based on the maximization of returns and focused on similar data using different formulations of the accounting statements (Lee & Upneja, 2007). Many researchers have studied and compared the bias and accuracy of these methods, attempting to identify which method best predicts equity values that most closely approximate the actual equity values. The present value models are typically covered in valuation textbooks and business school classes.

2.1.1.1 Discounted Cash Flow Model

The discounted cash flow (DCF) model is based on cash distribution or cash generation (Gode & Ohlson, 2006). The DCF model determines the present value of free cash flows that a firm is expected to earn in the future. Free cash flows (FCF) are defined as the after-tax cash flow available to all investors (debt holders and equity holders) of a firm, over a certain period. Therefore, FCF is the cumulative amount a firm has invested in the firm's operations. FCF equals net operating profit after taxes less the change in invested capital.

Unlike operating cash flow, FCF is independent of financing and is not affected by capital structure (Copeland et al., 2000). In reality, firms use FCF to distribute dividends, pay debt holders, or retain the cash (Schreiner, 2007). The present value of future FCF represents the intrinsic value of common equity and the market value of debt, including preferred stock, less cash and equivalents

(Schreiner, 2007). The DCF model computes the value of equity, P_e as (Lundholm and O'keefe, 2001);

$$P_e = \sum_{t=1}^{T} \frac{D_t}{(1+r_e)^t} + \frac{D_{T+1}}{(r_e - g)(1+r_e)^T}$$

$D_{T+1} = (1+g)NI_T - (1+g)SE_T + SE_T$,

OA_t = Operating asset balance at time t,

SE_t = Shareholders' equity at time t; $OA_t - L_t = SE_t$,

L_t = Liability balance at time t,

NI_t = Net income for the period ending at time t; $NI_t = OI_t - I_t$,

OI_t = Operating income for the period ending at time t, net of tax

I_t = Interest expense for the period ending at time t, net of tax,

D_t = Dividends paid to common equity; $SE_t = SE_{t-1} + NI_t - D_t$,

r_e = Cost of equity capital,

P_e = Value of the equity holders' claim at time 0.

2.1.1.2 Residual Income Valuation Model

The residual income valuation (RIV) model identifies residual income (RI), as a measure of a firm's ability to create value. The RIV model derives the firm's forecasts from abnormal earnings (Feltham & Ohlson, 1995; Ohlson, 1995). The residual income is the amount that net income exceeds the capital charge on the book value of equity. This capital charge can be regarded as the opportunity cost of invested capital (Peasnell, 1981).

Instead of focusing on cash generation as the DCF model does, the RIV model estimates the value of a firm as the present value of a combination of net income and the book value of equity (Schreiner, 2007). The RIV model reflects all changes during a fiscal period in the book value of equity, such as net income or dividends distributed to common shareholders (O'Hanlon & Peasnell, 2002). In this model, the value of the equity is computed as (Lundholm and O'keefe, 2001);

$$P_e = SE_0 + \sum_{t=1}^{T} \frac{RI_t}{(1+r_e)^t} + \frac{RI_{T+1}}{(r_e - g)(1+r_e)^T}$$

where $RI_t = NI_t - r_e SE_{t-1}$,

$RI_{T+1} = (1+g)NI_T - r_e SE_T$,

OA_t = Operating asset balance at time t,

SE_t = Shareholders' equity (the book value of equity) at time t; $OA_t - L_t = SE_t$,

L_t = Liability balance at time t,

NI_t = Net income for the period ending at time t; $NI_t = OI_t - I_t$,

OI_t = Operating income for the period ending at time t, net of tax

I_t = Interest expense for the period ending at time t, net of tax,

r_e = Cost of equity capital,

P_e = Value of the equity holders' claim at time 0.

Today many large firms use the RIV model as the standard tool for value-based management (Lee, 1996; Schreiner, 2007).

2.1.1.3 Comparison of Present Valuation Models

Penman and Sougiannis (1998) investigated DDM, DCF and RIM models to examine the superiority of their valuations, explaining the relation between value estimates and observed stock prices. They concluded that the RIM, a technique that is based on accrual earnings, predicted better with lower valuation errors. Penman and Sougiannis (1998) found that the valuation errors of the DCF exceeded those of the RIM, when each model was applied over a 10-year horizon. Moreover, they found the accruals of the RIM were more value-relevant than the cash flows of the DCF model or the dividends of the DDM, under generally accepted accounting principles (GAAP).

Francis et al. (2000) also concurred with the study by Penman and Sougiannis (1998). They compared the same three valuation models by using value line forecasts and an ex-ante approach. They also concluded that the RIM outperformed the DCF model with non-price based terminal values. According to them, the RIM estimated the current security prices more accurately and better explained the variation in security prices than did the other models.

Despite the arguments put forward by Penman and Sougiannis (1998) and Francis et al. (2000), Copeland et al. (2000), and Barber et al. (2011) have suggested that the DCF model is the most theoretically sound valuation model. According to Copeland et al. (2000), shareholders' value in the stock market is relevant to intrinsic value, which is generated by the long-term cash flow of the company. The DCF model involves discounting profits, the value that a stockholder will receive in the predictable future plus the terminal value (Kaplan & Ruback, 1995; Copeland et al., 2000). Moreover, the DCF model has the

advantage that most investors are familiar with the concept (Grant, 2003; Barber et al., 2011).

On the other hand, there are several studies that suggest that DCF model and RIM are equivalent. Courteau et al. (2001) demonstrated that the prediction of the DCF and RIM valuation models are equivalent and refuted the superiority of the RIM. To compare two valuation models, they used an arbitrary growth rate approach, Value Line's terminal stock price forecasts over a five-year valuation horizon. Lundholm and O'Keefe (2001) also refuted the idea that the RIM is superior to the DCF model. They insisted those two valuation models should be equivalent in theory, because they are derived from the same assumption: that price is the present value of expected future net dividends discounted at the cost of equity capital.

2.1.1.4 Disadvantage of the Present Valuation Models

There are still certain problems with the arguments for the superiority of present valuation models and arouse controversy on several points. As Courteau et al. (2001) have mentioned, the studies using Value Line's terminal stock price forecasts as a surrogate were not ideal, because Value Line's forecasts contained bias and measurement errors (Abarbanell and Bernard, 2000). This fact may diminish validity of their study.

Moreover, according to Lundholm and O'Keefe (2001), both of those valuation models are easy to make mistakes with in practical use. They identified common inconsistencies when the DCF and RIM models were implemented in research or in practice. Each inconsistency was commonly observed in practice,

and led to large variations in the estimates (Lundholm and O'Keefe, 2001). They suggested three inconsistencies: inconsistent forecast errors, incorrect discount rate errors and missing cash flow errors. The inconsistent forecasts error was identified in both models and caused by an assumption; namely the perpetuity of valuation. The incorrect discount rate error most often occurred with the DCF model because the discount rate is inconsistent under certain conditions. The final mistake, missing cash flow errors, occurred most often with the RIM when the financial statement forecasts do not satisfy the relation to clean surplus (Lundholm and O'Keefe, 2001).

Since the DCF model only considers cash and ignores other assets and liabilities, this model deals with a narrow part of a firm's value. The DCF model also has three specific deficiencies (Schreiner, 2007). First, it is difficult to measure FCF, because the separation between operating, investing and financing activities is blurred. Second, in the negative treatment of investments, FCF becomes troublesome. Anticipated investments reduce FCF even if they create value, and have to be implemented over a very long time to capture the anticipated value added (Schreiner, 2007). Indeed, many good firms have a negative FCF for a long time as new investments exceed operating cash flow (Penman & Sougiannis, 1998). Moreover, the negative treatment of investment has caused managers to manipulate FCF in the short term by delaying new investments (Schreiner, 2007). Third, FCF is difficult to forecast, because FCF does not generate value contemporaneously. This might one of reasons why analysts usually provide estimates of earnings rather than estimates of cash flows (Schreiner, 2007).

The RIV model also has two major problems in practical application. According to Schreiner (2007), the clean surplus relation only holds if equity related capital transactions are value neutral and measured by market values. In practice, capital transactions – such as convertible bonds and employee stock options – impact on the value of a firm, and are driven by market inefficiencies (Ohlson, 2005). Moreover, the RIV model is only justified if book values approximate market values reasonably well. However, book values are misplaced in many other industries, especially when accounting is conservative (Gode & Ohlson, 2006). Only a small number of practitioners used the RIV model for the valuation, because the valuation does not conform to practice (Ohlson, 2002; Schreiner, 2007).

2.1.2 Multiples Valuation Model

The present value models, such as the DDM, RIM and DCF model, are not as commonly used in practice as they are in theory (Block, 1999). Only 15.2 percent of the investment analysts always used present value models, because future cash flows and appropriate discount rates were difficult to estimate (Block, 1999). According to a number of studies, academics did not research and explain the valuation models which are used by professional investors or financial analysts. The analysts used various valuation models based on their preferred metrics, such as earnings or cash flow, independent of firm's industry membership. Articles that address this issue include those by Barker (1999); Demirakos et al. (2004); Liu et al. (2002); Lee (2003); Palepu et al. (2000); Lundholm and Sloan (2004). These articles are based on analysts' investment

reports, questionnaire surveys and interviews with investment analysts and fund managers.

Barker (1999) investigated the valuation models used by analysts and found that the price-earnings ratio is important to investment decisions in practice. According to his survey, the analysts choose the PE model and dividend yield model as important valuation models, and regard the DCF model and DDM as unimportant.

In contrast with the popularity of the RIM amongst researchers, the analysts used heuristic valuation models more than they used present value models when they forecasted the stocks (Bradshaw, 2002). According to Bradshaw (2002), there was little evidence that analysts' recommendations were explained by the RIM. He found that the Price-Earnings-to-Growth (PEG) model and analysts' projections of long-term earnings growth were more correlated with analysts' stock recommendations.

Asquith et al. (2005) found that only 12.8% of analysts used the DCF model or cash flow method in computing their price target. This is consistent with a study by Block (1999) which found that only 15.2 percent of analysts used present value models. Moreover, there was no correlation between the accuracy in predicting price targets and the present value approaches favored by finance textbooks and MBA curriculums (Asquith et al., 2005).

Demirakos et al. (2004) explained the valuation practices of financial analysts and sought out the methodologies analysts used to estimate a firm's value. They found that analysts typically choose the PE model or DCF model as their dominant valuation model, but the analysts who used the DCF model adopted a

comparative valuation model. The theoretical superiority of present valuation models was in contrast to the evidence on valuation models used in practice (Demirakos et al., 2004).

Imam et al. (2008) examined the use of valuation models by UK investment analysts, and found a limitation in applicability of the DCF model. They found that the DCF model was rarely determined by analysts' target prices and their recommendations. Even though analysts used DCF as primary model, consistent with a study of Demirkos et al. (2004), the estimation of analysts relied in practice upon valuation multiples and subjective judgments (Imam et al., 2008).

2.1.2.1 Concept of the Multiples Valuation Model

Properly executed multiples valuation can make forecasts more accurate and allows the company to design multiples analysis that provides valuable insights about itself and its competitors (Goedhart et al., 2005). The multiples valuation method is determined by a firm's equity value based on the market prices of comparable firms. The value of a firm is approximated by the market values of a peer group. Valuation by multiples calculates multiples for a set of benchmark companies, and then implies benchmark multiples to find the value of the company in question (Lie and Lie, 2002). The multiples valuation model assumes that the firms within the peer group are comparable and the market is efficient. Since this model underpins market-based valuation (similar assets should trade at similar prices), the application of a peer group multiple yields the intrinsic value of the target firm (Esty, 2000; Damodaran, 2006).

Compared to the DCF or the RIV model, the multiples valuation method is simple to apply (Damodaran, 2006). This valuation method is also easy to understand and simple to present to clients and customers, so it is very helpful to sell-side analysts and sales staff who are under significant time constraints (DeAngelo, 1990). Furthermore, the information of multiples is easy for investors to access through financial newspapers, magazines and online platforms (Schreiner, 2007). These sources publish common multiples of firms daily, and update them regularly. As multiples allow quick comparisons between firms, industries and markets, many investors use multiples as a substitute for comprehensive valuations and screen on multiples to detect undervalued stocks (Penman, 2006; Liu et al., 2007).

2.1.2.2 Common Value Multiples

As mentioned above, the theoretical emphasis is on present valuation models, but these are rarely used by investment bankers and analysts. According to Houston et al. (2006), 10 percent of the valuations of analysts' reports are based on the DCF model, while 73 percent of their reports are using multiples valuation models. They regularly use valuation by multiples, as a substitute for or supplement of the DCF or RIM techniques.

Earnings or cash flow multiples, and asset multiples are the most commonly used multiples. Earnings or cash flow multiples include price-to-earnings (P/E) ratios; relative price-to-earnings (Relative P/E) ratios; earnings before interest, tax, depreciation and amortization (EBITDA) multiples; and revenue multiples. Asset multiples include market-to-book values. A commonly

used multiple is the price-earnings ratio (P/E ratio, PER) of stocks in a similar industry. According to Asquith et al. (2005), 99.1 percent of 1,126 analysts used an earnings multiple, (e.g., a price-to-earnings ratio, EBITDA multiple, or a relative price-to-earnings ratio). This research also evaluated the quality of forecasts based on various multiples.

2.1.2.2.1 Price to Earnings Multiple

In the real word, price-to-earnings (P/E) multiples are used to represent the firms' equity market values and are widely used in practice as valuation multiples (Spremann, 2005). The notion behind the P/E ratio is that wealth is created when it is earned, rather than when cash is collected (Schreiner, 2007).

Although P/E multiples are widely used, they have three major flaws (Goedhart et al., 2005; Schreiner, 2007). First, P/E multiples are systematically affected by capital structure (Frykman & Tolleryd, 2003). For example, P/E can be artificially increase its P/E ratio by increasing debt. Second, as the P/E ratio is based on earnings, such as non-operating items, multiples based on P/E can be misleading. The P/E multiple is useless if a firm has a negative or low net income (Pereiro, 2002). Third, different accounting policies affect the net income. Despite these problems, the P/E multiple is the most popular multiple by market participants, largely because of its simplicity (Schreiner, 2007).

2.1.2.2.2 Forward-looking Multiples

If the value driver of a multiple refers to forecasts, instead of to historical data, it is termed a forward-looking multiple (Benninga & Sarig, 1997). Empirical evidence demonstrates that forward-looking multiples are more accurate predictors of value. Liu et al. (2002) compared the performance of historical and forward industry multiples for companies trading on the NYSE, the American Stock Exchange and NASDAQ. They found that the dispersion of historical earnings-to-price (E/P) ratios was nearly twice that of one-year forward E/P ratios. They also examined the pricing errors for each multiple and found that the error of one-year forecasted earnings (18 percent) was lower than that for historical multiples (23 percent). Similarly, Kim and Ritter (1999) also compared the pricing errors of historical and forward earnings multiples for 142 initial public offerings. They found that the average pricing error of one- and two-year forecast multiples fell from 55.0 percent, to 43.7 percent, to 28.5 percent respectively.

2.1.2.2.3 Enterprise Value to EBITDA Multiples

One alternative to the multiples of P/E is the multiples of enterprise value (EV) to EBITDA (Goedhart et al., 2005). As entity value multiples, the EV to EBITA (EV/EBITA) multiples are less affected by capital structure decisions (Goedhart, 2005; Schreiner, 2007). Since enterprise value includes both debt and equity, and EBITDA is the profit available to investors, the changes in capital structure will have no systematic effect. Moreover, the EV/EBITDA multiple measures operating performance and is not affected by different tax rules (Schreiner, 2007). Kim and Ritter (1999) found that the EBITDA multiple yielded

more precise valuations than the P/E, market value to book value, price to sales, and enterprise value to sales multiples did. Gilson et al. (2000) compared the valuation accuracy of the DCF method and that of EBITDA multiples for companies emerging from bankruptcy in the same industry. They found that the valuation error of the DCF model was 21 percent and valuation error fell to within 15 percent, when they applied the median of EBITDA multiples.

2.1.2.2.4 Other Multiples

In contrast to previous research, Lie and Lie (2002) evaluated various multiples and found the asset multiple (market value to book value of assets) was a better estimate than sales and earnings multiples. This goes against the results of several studies that claimed that the book value performed poorly in terms of predicting accurately.

Beatty et al. (1999) suggested different combinations of multiples, earnings, book value, dividends and total assets. They found that harmonic mean book and earnings multiples performed best in terms of the accuracy of the target price. Baker and Ruback (1999) examined econometric problems with computing industry multiples, and found that industry-adjusted EBITDA performs better than EBIT and sales.

Although the price earnings ratio and EV/EBITA are the most popular multiples used for valuation, several researchers demonstrated that analysts applied various multiples and combinations of multiples based on their individual preferences. Barker (1999) showed that analysts used different multiples more appropriate to different industries. For example, analysts in the financial sector

preferred using price-to-book value (P/B) and P/E multiples, and analysts in the consumer service industry preferred using price to operating cash flow (P/OCF) multiples (Barker, 1999; Tasker, 1999). Tasker (1999) found a systematic use of industry specific multiples, described as variations in the effectiveness of accounting standards across the industry.

Moreover, Fernandez (2001) found that the multiples of companies operating in the same industry have a very wide dispersion. For example, within the food and drink industry, the food producers sector commonly use EV/EBITDA and EV/S, and the brewers and pubs sector usually use ROCE, PER to growth and PER relative for valuation. Demirakos et al. (2004) and Imam et al. (2008) found that analysts carefully choose and combine various valuation multiples in understandable ways, such as their familiarity with a particular valuation model and its acceptability to clients. For instance, one food sector report stated that their price target is based on an average of DCF and PE (Imam et al., 2008). However, those multiples used in practice did not take into account the accuracy of valuation or the client driven factor.

2.1.3 Present Valuation Models vs. Multiples Valuation Model

In theory, the present value models and the multiples valuation model should yield identical valuations (Demirakos et al., 2010). However, implementation of these models generates different valuations in the real world. Various studies have examined the accuracy of valuation models.

Kaplan and Ruback (1995) compared the performance of DCF valuation and multiple valuation models. They found that both methods performed

similarly when companies were in similar industries and made similar transactions. Similarly, Gilson et al. (2000) also concluded the DCF and multiples valuation approaches have the same degree of accuracy, when used for firms in bankruptcy. However, comparing analyst valuation choice between P/E and DCF models, the study undertaken by Demirakos et al. (2004) showed that P/E multiples models outperformed DCF models at the 1 percent level for IPO companies.

2.2 Target Price

Analysts often mention valuations as the 'target' or 'objective' price in their reports, and the target price reflects the analyst's valuation of stock (Bradshaw, 2000). According to Asquith et al. (2005), several factors are considered by analysts in their forecasting of target price. An analyst first evaluates the firm's cash flows and risk level, then evaluates the industry's prospects, and then undertakes an assessment of the macroeconomic factors that affect the overall market. The availability of analyst data to individual investors, and the interest it generated, was increased particularly by its inclusion on popular websites, such as TheStreet.com, Yahoo! Finance, and The Motley Fool (Bradshaw, 2000).

Target price has received a great deal of attention from media, most of it skeptical (Bradshaw, 2000). According to Asquith et al. (2005), headlines such as "Price Targets are Hazardous to Investors' Wealth'' (New York Times, 2001), or ''Forget Analysts' Price Targets: They're Really Just for Show'' (Forbes, 2000) are representative of this issue. According to Dow Theory Forecasts (2002), as target price is a stock's expected appreciation, it could be quite a subjective

measurement. In addition, target prices that are influenced by other things than company fundamentals are problematic. For example, analysts have received guidance on earnings and sales prospects from corporate insiders (Dow Theory Forecasts, 2002). Moreover, because of the relationship with insiders, several analysts issued highly favorable target prices for personal compensation, such as to win lucrative corporate finance work for their investment banking divisions (Dow Theory Forecasts, 2002; Asquith et al., 2005).

Compared to the perspective of the media, target price is regarded as valuable in recent academic studies, but has only been included in a few recent studies (Brav and Lehavy, 2003; Bonini et al., 2010). Several researchers found that target price contains information which can be valuable to investors, and may thus have an influence on their investment strategies (Bradshaw, 2000; Dow Theory Forecasts, 2002; Asquith et al., 2005; Bonini et al., 2010). Understanding how analysts value and recommend stocks is of interest to many investors (Bradshaw, 2000). Analysts provide target prices to support their stock recommendations (Bradshaw, 2002; Bradshaw, 2004). There was evidence that investors considered target price forecasts to be valuable and reacted significantly after the release of target prices (Brav & Lehavy , 2003; Asquith, et al.,2005).

Brav and Lehavy (2003) suggested that target prices are significant to capital markets. Target prices are informative in the presence of earnings forecasts, because they are computed as the product of forecasted earnings and a financial ratio such as an earnings yield (Fernandez, 2001; Asquith, et al. 2005). Bonini et al. (2010) also showed that target price provides valuable information to investors, because it is a straightforward measure of the potential change in the value of the

underlying security. The central question then becomes whether the investor and market should react to target price.

There were several studies to measure the accuracy of target price forecasts. The studies conducted by Barber et al. (2001), and Brown and Mohd (2003) tried to measure relative performance at the end of a fixed period of 12 months or after the release of actual earnings by companies. On the other hand, Asquith et al. (2005), and Bradshaw and Brown (2006) provided simple measures of target price accuracy; namely, that target price is accurate, if the share price reaches or exceeds the target at the time horizon.

Chapter 3

METHODOLOGY

This study will be guided by the following research questions, outlined in section 1.3:

1) Which type of valuation model, the Residual Income Model or multiples valuation model, estimated restaurant stocks more accurately, and performed well for this particular industry?
2) Which common multiples valued restaurant stocks more precisely and provided more accurate estimations?
3) Are restaurant stocks underestimated based on the stock valuation models?

3.1 Research Design

A non-experimental quantitative research design was used for this study, to examine the valuation accuracy and the performance of stock valuation models, to compare different multiples, and to determine the most effective valuation model for restaurant stocks. A quantitative research method was used for this study, because it allowed the comparison of results (valuation errors), and enabled the explanations and predictions that may be generalizable to the restaurant stock market (Leedy and Ormrod, 2003).

Secondary data were used for this study and were collected from the Bloomberg and FactSet databases. Both databases provide current and historical

financial quotes, business news, research and statistics on worldwide companies. In this study, the longitudinal data was also used for comparison of valuation models. The longitudinal design allows for the examination of variables, such as the accuracy or the performance exhibited by a group or groups over time (Creswell, 2012). The data for this study were from the period 2005 to 2012, and the estimation of restaurant stock prices was based on annual data.

Using descriptive statistics, this study compared the bias of estimation and the effectiveness of each stock valuation model and the common multiples. Descriptive statistics enable the use of frequencies or percentages, averages, and sometimes variability (McMillan, 2006), and for this study the researcher used descriptive statistics to evaluate the valuation models.

3.1.1 Sample and Data

Alford (1992) examined the effect of the choice of the companies for the accuracy of multiples valuation models and found that a peer group based on same industry generated the smallest number of valuation errors. To increase the valuation accuracy of valuation models, the firms in this study were selected from the restaurant industry, which is classified under Standard Industrial Classification (SIC) code 5812. This study included 50 restaurant companies publicly traded on the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), and National Association of Securities Dealers Automated Quotations (NASDAQ) system. Following previous studies on the restaurant industry, the sample of this study were selected from each three restaurant segments – full-service,

economy/buffet and fast-food – based on a restaurant firm's major service features. Table 1 lists the sample restaurants in the three restaurant sectors.

Table 1. List of Restaurant Firms

Full-Service Restaurants (Thirty firms)	Economy Restaurants (Five firms)	Fast-Food Restaurants (Fifteen firms)
Applebee's Int'l, Inc.	CEC Entertainment, Inc.	AFC Enterprises
Ark Restaurants Corporation	Einstein Noah Restaurant	Back Yard Burgers, Inc.
Benihana, Inc.	Luby's, Inc.	Chipotle Mexican Grill Inc.
Biglari Holdings Inc.	Panera Bread Company	CKE Restaurants, Inc.
BJ's Restaurants, Inc.	Pizza Inn, Inc.	Domino's Pizza, Inc.
Bob Evans Farms, Inc.		Friendly Ice Cream Corporation
Boston Restaurant Association		Good Times Restaurants
Brinker International		McDonald's Corporation
Buffalo Wild Wings Inc.		Nathan's Famous, Inc.
CBRL Group, Inc.		Papa John's Int'l, Inc.
Champps Entertainment		Red Robin Gourmet burgers Inc.
Cheesecake Factory, Inc.		Sonic Corporation
Chefs International, Inc.		Starbucks
Darden Restaurants, Inc.		Wendy's International
Dave & Buster's, Inc.		Yum! Brands, Inc.
DineEquity Inc.		
Elmer's Restaurants, Inc.		
Famous Dave's of America		
Flanigan's Enterprises		
Grill Concepts, Inc.		
J. Alexander's Corporation		
Landry's Restaurants, Inc.		
Max & Erma's Restaurants		
Mexican Restaurants, Inc.		
Mortons Restaurant Group Inc		
O'Charley's, Inc.		
Outback Steakhouse, Inc.		
P.F. Chang's China Bistro, Inc.		
Ryan's Restaurant Group		
Worldwide Restaurant Concepts		

Table2. Descriptive Statistics

	Mean	Median	25th Percentile	75th Percentile
Book value of assets ($ millions)	975	298	152	597
Total enterprise value ($ millions)	4778	1083	404	2256
EBITDA/book value of assets	0.0059	0.0036	0.0026	0.0055

Table 2 presents the summary statistics for the sample of this study. The median book value of assets was $298 million, and total enterprise value (i.e., book value of assets less book value of equity plus market value of equity) was $1083 million. The median ratio of EBITDA to book value of assets was 0.0036. On the other hand, the mean book value of assets was $975 million, the mean of total enterprise value was $4778 million, and the mean ratio of EBITDA to book value of assets was 0.0059. The distributions for most of these financial characteristics are skewed, as indicated by the large difference between the means and medians. Compared to other values, the ratio of EBITDA/book value of assets was indicated less dispersion

For these 50 sample firms, each data was collected from January 2005 to March 2012. All of the financial data are from the fiscal year 2005, when the sales growth of the restaurant industry started to decrease (National Restaurant Association, 2012). All of the financial data were collected daily, weekly and annually from the Bloomberg and FactSet financial databases and each data was averaged per year to estimate the restaurant values.

The data for this study included both historical data and forecasted data. The historical data used in this study were retrieved from FactSet and

Bloomberg databases and incorporated the book value per share, the shares outstanding, the risk-free rate, the systematic risk for the firm, the market risk premium, the price-to-earnings ratio, the enterprise value/EBITDA ratio, the enterprise value/book value ratio and actual prices. The forecasted data collected for this study were retrieved from the Bloomberg database and incorporate the estimates of book value for current fiscal year, the estimates of book value for the next fiscal year, the estimates of net income for the current fiscal year, the estimates of net income for the next fiscal year, and the average forecasted price-to-earnings ratios.

3.2 Design for Valuation Models

This section explains the design and assumptions of the residual income valuation model and multiples valuation models that were used for this study. It describes how the estimates were predicted by the valuation models, and demonstrates how those estimations were compared in the study.

3.2.1 Residual Income Model

The Residual Income Model (RIM) was selected as a representative of the present value model for this study, rather than the DCF model. The superiority of RIM has been proved by many studies. For example, the valuation estimates of RIM were more accurate for a short time periods than estimates of DCF model (Palepu et al., 2000). The RIM method used in this study was as follows:

$$P_e = SE_0 + \sum_{t=1}^{2} \frac{RI_t}{(1+r_e)^t} + \frac{NI_2\,(1+0.03) - r_e SE_2}{[(r]_e - 0.03)(1+r_e)^2} \quad ,$$

Where P_e = value of the equity holder's claim at time 0;

RI_t = residual income for the period ending at time t; $RI_t = NI_t - r_e SE_{t-1}$;

r_e = cost of equity capital at the firm-specific discount rate, estimated by the CAPM;

SE_t = shareholders' equity of the period ending at time t;

NI_t = net income for the period ending at time t;

CAPM (Capital Asset Pricing Model) = $r_f + \beta[E(r_m) - r_f]$;

r_f = risk-free rate;

β = estimate of the systematic risk for the firm; and

$[E(r_m) - r_f]$ = market risk premium

A firm's market value of RIM is determined by the firm's book value plus discounted RIs for the first three years. In this study, three consecutive years of historical and forecasted financial data were required to estimate each restaurant firm's value. The RI is defined in this study as the difference between actual income and expected income.

Unlike other studies, using historical data for the RIM, this study used forecasted data. According Frankel and Lee (1998), the prediction of stock return improves when analysts' forecasts are used for the RIM. Moreover, by using recent data from 2005 to 2012, this study was able to imply the contemporaneous restaurant stock price that could well represent the current trends in the restaurant industry.

This study used the Bloomberg database to collect the forecasted data for expected income, instead of historical data. To compute the current equity value, the estimates of book value for the current fiscal year, the estimates of book value for the next fiscal year, the estimates of net income for the current fiscal year, and the estimates of net income for the next fiscal year were retrieved from the Bloomberg database.

Because of the present value of perpetuity, the year 3 of RI used in this study assumed 0.03 growth rate for the RI after year 2. This assumption is reasonable, when considering the recent economic turmoil in the United States. Historically, from 1947 until 2011 the United States' average quarterly growth rate was 3.28 percent (Trading Economics, 2012). To estimate the required rate of return on equity, this study employed the CAPM model, the most frequently used model for the required rate of return.

All 3-year period financial data, such as shares outstanding, risk-free rate, risk premium, and the systematic risk for the firm, were collected daily, weekly, and annually through the Bloomberg and FactSet databases. Based on the RIM method, the estimates of restaurant value were calculated per year from 2005 to 2012. The valuation error was then calculated as the natural log ratio of estimated values relative to market values.

3.2.2 Multiples Valuation Model

This study also evaluated various multiples that are used to estimate company value. The research design for the multiples valuation model follows that used in the study conducted by Lie and Lie (2002).

3.2.2.1 The Multiples

Four multiples which were judged to be most suitable for this study were chosen from the ten multiples used in Lie and Lie's (2002) study. As Lie and Lie (2002) pointed out, adjusting for companies' cash levels does not improve the estimates of a company's value, so this study excluded the adjusted value multiples. According to Liu et al. (2001), the sales multiple performed the worst among the multiples, so this study rejected the sales multiple. The EBIT multiple was also exempt from this study, because the EBITDA multiple estimated better than EBIT multiple did (Lie & Lie, 2002). Furthermore, the EBITDA multiple is more reasonable than EBIT multiple for this study, because the EV/EBITDA multiple is the most commonly used valuation multiple in the food and drink industry (Fernandez, 2001). Finally, four multiples of companies in the restaurant industry were selected for this study: P/E, forecasted P/E, enterprise value/book value and enterprise value/EBITDA. The definitions of these multiples are as follows:

- P/E – price of the company's common equity at the end of the fiscal year scaled by earnings per share for the same year
- Forecasted P/E – price of common equity scaled by the median forecast of next year's EPS from the Bloomberg database
- Enterprise value/EBITDA – enterprise value scaled by earnings before interest, taxes, depreciation and amortization
- Enterprise value/Book value – enterprise value scaled by book value of assets

These four multiples were computed the same way they were computed in Lie and Lie (2002), except for the fact that this study used forecasted P/E ratios estimated by Bloomberg analysts. The P/E multiple is the stock price divided by the actual earnings per share. The EBITDA is earnings before interest, taxes, depreciation and amortization, and the Book value is the book value of total assets. Enterprise value multiples were defined as the total enterprise value divided by EBITDA or Book value. Total enterprise value was estimated as total assets less book value of equity plus the product of price per common share and number of common shares outstanding. Table 3 provides summary statistics for the four multiples.

Table 3. Multiples Used in Analyses

	Mean	Median	25th Percentile	75th Percentile
P/E	29.9	18.4	14.7	25.9
Forecasted P/E	63.6	17.6	13.5	23.9
EV/EBITDA	9.81	8.29	6.97	10.3
EV/Book value	13.0	3.51	2.07	5.3

Note: Total enterprise value was estimated as total assets less book value of equity plus the product of price per common share and number of common shares outstanding (Lie & Lie, 2002).

The median P/E multiple based on current earnings was 18.4, whereas the median based on forecasted earnings was 17.6. The median ratio of total enterprise value to EBITDA was 8.29, whereas the median enterprise value-to-book ratio was 3.51. All of the means are greater than medians, suggesting that the distributions of multiples are positively skewed. Compared to other multiples the EBITDA multiple was less skewed.

3.2.2.2 Estimation of Value

To estimate the value, the median multiple for peer group was multiplied by the relevant financial figure for the company. For example, the estimated value was calculated as the product of its EBITDA or book value and the median firm value multiple. All four benchmark multiples were used in the same manner as in the studies conducted by Kim and Ritter (1999), Lie and Lie (2002) and Liu et al. (2007). Finally, this study calculated the valuation error as the natural logarithm of the ratio of the estimated value to the market value, following Kaplan and Ruback (1995), Kim and Ritter (1999), Gilson et al. (2000), Lie and Lie (2002) and Liu et al. (2007).

Chapter 4

RESULTS AND DISCUSSION

The findings of this study are presented in three segments: comparison of different valuation methods, a comparison of different multiples, and the phenomenon of undervalued restaurant market. In the first segment, this study attempts to identify the most effective valuation model for restaurant companies by comparing the valuation accuracy of various valuation methods. In next segment, the study considers different multiples in order to determine the best multiple for valuation of restaurants. Finally, the phenomenon of undervalued restaurant companies is addressed.

4.1 Results

4.1.1 Comparison of Different Valuation Methods

Table 4 presents summary statistics for the valuation errors of the RIM and multiples valuation methods. The valuation errors are computed as the natural log of the ratio of estimated values to the market value. The log ratio was used because it is symmetric with respect to overestimates and underestimates (Kaplan & Ruback, 1999). The estimation errors were reported as percentages, in order to interpret the percentage difference between the estimated value and market value.

Table 4. Valuation Errors for the Restaurant Companies

	Present Valuation	Multiples Valuation			
	Residual Income Model	Equity Valuation		Total Enterprise Valuation	
		P/E	Forecasted P/E	EV/ EBITDA	EV/ Book Value
Panel A: Summary Statistics for Valuation Errors					
Mean	-28.15%	0.58%	-6.21%	-0.49%	13.31%
Median	-32.73%	4.93%	8.67%	1.27%	1.27%
Standard deviation	62.58%	33.38%	31.94%	24.65%	57.84%
Inter-quartile range	74.18%	42.03%	43.17%	35.27%	88.88%
Panel B: Performance Measures for Valuation Errors					
Fraction within 15%	17.81%	38.61%	38.91%	43.75%	25.00%
Mean absolute error	-11.76%	-14.33%	-18.77%	0.42%	116.39%
Median absolute error	-29.66%	-3.77%	-12.58%	-0.41%	92.63%

Note: Comparison of present value model (Residual Income Model) and multiples valuation model in 50 restaurant companies, between 2005 and 2012. The first four rows present the means, medians, standard deviations and interquartile ranges of the valuation errors. The valuation errors equal the natural log of estimated values relative to market values. Valuation errors are reported in percentages. The performance was measured by the fraction within 15 percent, the means and the medians of absolute error. The fraction within 15 percent was defined as the fraction of valuation errors whose absolute value was less than 15 percent (Lie & Lie, 2002). The mean and median absolute errors of the valuations were reported in percentages. P/E is the price of the company's common equity at the end of the fiscal year scaled by earnings per share for the same year. Forecasted P/E is a price of common equity scaled by the median forecast of next year's EPS from the Bloomberg database. Enterprise value/EBITDA is an enterprise value scaled by earnings before interest, taxes, depreciation and amortization. Enterprise value/Book value is an enterprise value scaled by book value of assets.

Panel A of Table 4 shows that the mean valuation error of the Residual Income Model was -28.15 percent, which means that the RIM estimate was 28.15 percent lower than the market value. Moreover, other errors – the median valuation error (-32.73 percent), the mean absolute error (-11.76 percent), and the

median absolute error (-29.66 percent) – also show that RIM method underestimated the value of restaurants.

On the other hand, the mean valuation errors of the four multiples were much lesser than the mean error of the RIM. The mean valuation error of the P/E multiple was 0.58 percent, that of the forecasted P/E multiple was -6.21 percent, that of the EBITDA multiple was -0.49 percent, and that of the book value multiple was 13.31 percent. This means that the P/E multiple overestimated by 0.58 percent, the forecasted P/E multiple underestimated by 6.21 percent, the EBITDA multiple underestimated by 0.49 percent, and the book value multiple overestimated by 13.31 percent compared to the market value. This finding shows that the multiples valuation method estimated the restaurant firms' value more accurately than the RIM did. The median of valuation errors in multiples valuation also showed a similar result, and was lower than the median error of the RIM.

In Panel B, the data for the fraction within 15 percent indicated that the multiples valuation model provided more accurate estimates than the RIM. According to Lie and Lie (2002), the definition of 'fraction within 15 percent' is "the fraction of valuation errors whose absolute value is less than 0.15". In other words, the fraction within 15 percent row in Table 4 indicated the percentage of valuation errors, ranging from -0.15 to 0.15. The results showed that the Fraction within 15 percent of all multiples valuation models was greater than that of the RIM. This indicated that all multiples valuation models performed better than the RIM, providing estimations that are more precise. The EBITDA multiple valuations provided the most accurate estimations (43.75 percent), and the RIM provided the least accurate estimates (17.81 percent).

Based on the dispersion of the mean absolute errors and the median absolute errors, the multiples valuation methods performed better than the RIM, with the exception of the EBITDA multiples valuation method. The mean absolute error of the RIM was -12 percent, that of the P/E multiples was -14 percent, that of the forecasted P/E multiples was -19 percent, that of the EBITDA multiples was 0.4 percent and that of the book value multiples was 116 percent. On the other hand, the median absolute error of the RIM was -30 percent, that of the P/E multiples was -4 percent, that of the forecasted multiples was -13 percent, that of the EBITDA multiples was -0.4 percent, and that of the book value multiples was 93 percent. Compared to the RIM, most of the multiples valuation models are less skewed, except for the book value multiple. The dispersion of the multiples valuation models was less than that of the RIM; in other words, most of the multiples valuation models performed and explained more effectively than RIM.

Overall, most of the multiples valuation methods performed better than the RIM. Based on the Fraction within 15% and the median absolute errors, the P/E, forecasted P/E, and EBITDA multiple valuation models provided more accurate estimates than the RIM method. This means that the valuation accuracy of the RIM was more dispersed than that of the multiples valuation method, with the exception of the book value multiple. Despite the fact that the RIM demonstrated more bias than the book value multiples for the restaurant firms, it had a lower dispersion of the valuation error than book value multiple.

The mean absolute error also allowed for the comparing of this study's findings and those of Lee and Upneja (2007). The mean absolute error for Lee and Upneja (2007), using historical data with the RIM for non-lodging firms (including

restaurants), was 33 percent. A direct comparison of the valuation accuracy in the restaurant group and non-lodging group may not be entirely fair, but this comparison demonstrated an important point. The data for the mean absolute error of this study (-11.76 percent) indicated that the RIM based on the forecasted data estimated more accurately than the RIM based on historical data.

4.1.2 Comparison of Different Multiples

Comparing the valuation errors, the multiples valuation method estimated the value of restaurant firms more accurately than the RIM method did. In this segment, different multiples valuations are compared, with the aim of selecting the best multiples for restaurant stock valuation. As mentioned in Chapter 3, to estimate a firm's value, the median multiple for the peer group was multiplied by the relevant financial figure for the company. For example, the estimated value was calculated as the product of the firm's EBITDA and the median firm value multiple. Table 5 provided the evidence and justified the use of the median multiples for valuation, instead of the mean multiples.

Table 5. Valuation Errors of the Mean Multiples and the Median Multiples

	Mean	Median	Standard Deviation
Mean P/E	-3.7%	148.0%	39.9%
Median P/E	0.6%	4.9%	33.4%
Mean Forecasted P/E	116.2%	126.4%	50.0%
Median Forecasted P/E	-6.2%	-8.7%	31.9%
Mean EV/EBITDA	12.7%	9.4%	41.0%
Median EV/EBITDA	-0.5%	1.27%	24.7%
Mean EV/book value	98.1%	105.4%	121.7%
Median EV/book value	13.31%	1.3%	57.8%

Note: Table compares the mean multiples and the median multiples in 50 restaurant companies, between 2005 and 2012. The first four rows present the means, medians and standard deviations of the valuation errors. The valuation errors equal the natural log of estimated values relative to market values. P/E is a price of the company's common equity at the end of the fiscal year scaled by earnings per share for the same year. Forecasted P/E is a price of common equity scaled by the median forecast of next year's EPS from the Bloomberg database. The enterprise value/EBITDA is an enterprise value scaled by earnings before interest, taxes, depreciation and amortization. Enterprise value/Book value is an enterprise value scaled by book value of assets.

To estimate the value, the mean multiples for peer group and the median multiples for peer group were calculated and multiplied by the relevant financial figure for the company. Then, the valuation errors of each the mean multiples and the median multiples were calculated.

All the valuation errors of the four median multiples were less than the errors of the four mean multiples. This result showed that the median multiples predicted better than the mean multiples did. This finding is consistent with the studies of Kim and Ritter (1999), Lie and Lie (2002), and Liu et al. (2007). Even within the same industry, the use of mean multiples overlooks the fact that companies have different expected growth rates, returns on invested capital and capital structures (Goedhart et al., 2005).

Based on this finding, the study focused on four medians of multiples, as benchmark multiples. Statistics for the valuation errors for the multiples are reported in Table 6.

Table 6. Valuation Errors for the Multiples Valuation

	Equity Valuation		Total Enterprise Valuation	
	P/E	Forecasted P/E	EV/ EBITDA	EV/ Book Value
Panel A: Summary Statistics for Valuation Errors				
Mean	0.58%	-6.21%	-0.49%	13.31%
Median	4.93%	8.67%	1.27%	1.27%
Standard deviation	33.38%	31.94%	24.65%	57.84%
Inter-quartile range	42.03%	43.17%	35.27%	88.88%
Panel B: Performance Measures for Valuation Errors				
Fraction within 15%	38.61%	38.91%	43.75%	25.00%
Mean absolute error	-14.33%	-18.77%	0.42%	116.39%
Median absolute error	-3.77%	-12.58%	-0.41%	92.63%

Note: Comparison of multiples valuation models in 50 restaurant companies, between 2005 and 2012. The first four rows present the means, medians, standard deviations and interquartile ranges of the valuation errors. The valuation errors equal the natural log of estimated values relative to market values. Valuation errors are reported in percentages. The performance was measured by the fraction within 15 percent, the means and the medians of absolute error. The fraction within 15 percent was defined as the fraction of valuation errors whose absolute value was less than 15 percent (Lie & Lie, 2002). The mean and median absolute errors of the valuations were reported in percentages. P/E is the price of the company's common equity at the end of the fiscal year scaled by earnings per share for the same year. Forecasted P/E is a price of common equity scaled by the median forecast of next year's EPS from the Bloomberg database. Enterprise value/EBITDA is an enterprise value scaled by earnings before interest, taxes, depreciation and amortization. Enterprise value/Book value is an enterprise value scaled by book value of assets.

The mean valuation error for the P/E multiples (0.58 percent) and EV/EBITDA multiples estimates (-0.49 percent) were not significantly different from zero, indicating no bias in the estimations. However, the mean valuation error of the forecasted P/E multiples were more biased than the P/E multiples and

EBITDA multiples. The mean valuation error of the forecasted P/E multiples was reported as -6.21 percent, which means that the forecasted P/E multiples estimated 6.21 percent lower than the market value. Moreover, this result also contrasted with other studies, such as Liu et al. (2002), and Kim and Ritter (1999), which found that the forecasted multiples estimated better than historical multiples. This result suggests that this is one piece of the evidence that the analysts tend to underestimate when they value restaurant firms. The mean valuation errors of book value multiples were 13.31 percent, suggesting that the book value multiple overvalued the restaurant companies, and among the four multiples were worst at predicting value.

The other statistics in Panel B of Table 6 describe the distribution of the valuation errors and the performance of estimates: the mean and median absolute errors, and the fraction of errors that are less than 15 percent. The fraction within 15 percent in Table 6 varied from 25.00 percent to 43.75 percent. Among the four multiples, the fraction within 15 percent of the EBITDA multiples was greater (43.75 percent) than that of the P/E multiples (39 percent), forecasted P/E multiples (39 percent), and book value multiples (25 percent). This result suggested that the EBITDA multiple provided better estimates and valued more effectively than the other three multiples. The book value multiple also performed worst and provided least accurate estimations among the four multiples.

Moreover, there were no significant difference between the forecasted P/E multiple (38.91 percent) and P/E multiple (38.61 percent) for prediction performance. Contrasted with the findings of Kim and Ritter (1999), Lie and Lie

(2002), and Liu et al. (2002), the forecasted P/E multiple provided similarly accurate estimations to the historical P/E multiple.

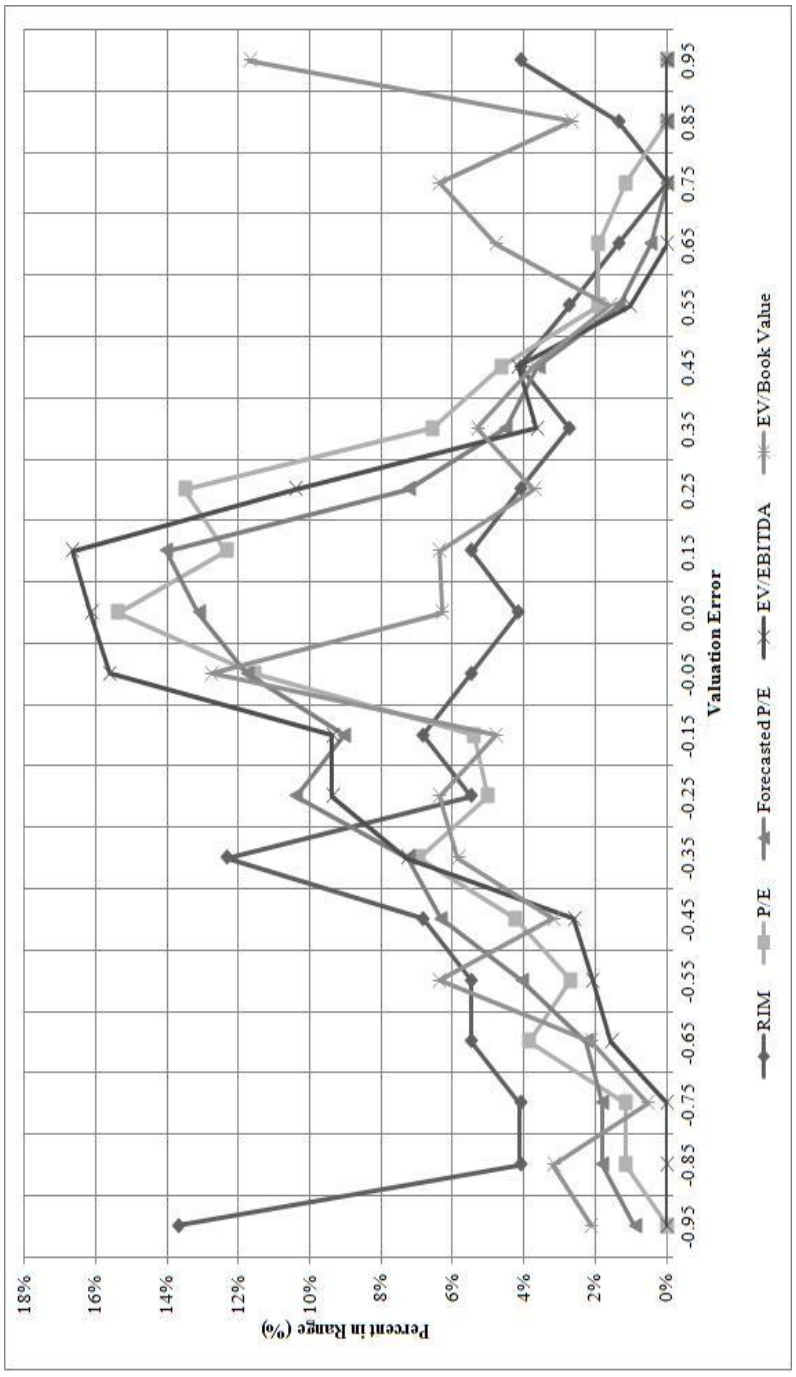
Based on the mean absolute error and median absolute error, the result of the performance of estimation was consistent with the result of the fraction within 15 percent. The EBITDA multiple was least skewed among the four multiples, indicating that the dispersion of estimations was less than for other multiples. The book value multiple was more skewed and had more widely dispersed estimations than other multiples.

Overall, the EBITDA multiple estimated more accurately and performed more effectively than other multiples. On the other hand, the book value multiple had more biased prediction and provided less accurate estimations among the four multiples, indicating that the book value multiple was the worst multiples valuation method among the four multiples.

4.2 Discussion

This section discusses whether restaurant stocks have been underestimated based on the valuation methods which have been commonly employed by analysts and investors. Figure 1 provides the entire distribution of valuation errors for each valuation method: RIM, P/E, forecasted P/E, EBITDA, and Book value multiples.

Figure 1. Distribution of Valuation Errors



Note: Distribution of valuation errors for Present valuation model and Multiples valuation models in 50 restaurants companies, between 2005 and 2012. The valuation errors equal the natural log of estimated values relative to market values.

The horizontal axis in Figure 1 contained the ranges for valuation errors with width equal to 0.1. For example, 0.05 refers to valuation errors lying in the range between 0 and 10 percent. The vertical axis represented the percentage of the valuation model with valuation errors that lie within that range. Combining the percentages contained in the two ranges indentified by -0.05 and 0.05 might suggest a superior performance of the valuation methods (Liu et al., 2007). As a result, the EBITDA multiples provided remarkably accurate valuations for U.S. restaurant companies. The EBITDA multiples would thus represent a reasonable restaurant valuation model. On the other hand, the RIM performed the worst among valuation models. These findings are also consistent with the results from previous sections of this thesis.

Furthermore, the phenomenon of undervalued restaurants could be identified from Figure 1. The percentages contained in the range from -0.95 to -0.05 represented the range of valuation errors between -1 (-100 percent) and 0 (0 percent). This range is the percentage of underestimated value by the RIM and multiples valuation models. Overall, 53 percent of estimations were undervalued. Especially the percentage of undervalued estimations by the RIM (70 percent) and by the forecasted P/E multiple (56 percent) were greater than the percentage of other valuation models. This indicated that the RIM and forecasted P/E multiple provided undervalued estimates more than other valuation models.

Both valuation models – the RIM and forecasted P/E multiples – used the forecasted data estimated by Bloomberg analysts. The RIM used the forecasted net income and forecasted book value to compute the discounted residual income, and the forecasted P/E multiple used forecasted P/E ratios to compute the

estimations. As mentioned above, the RIM and the forecasted P/E multiple provided a greater number of underestimates than other multiples valuation models. Taking these all these facts into consideration, it could be inferred that the (Bloomberg) analysts do undervalue restaurant firms.

Chapter 5

CONCLUSION AND LIMITATIONS

5.1 Conclusion

This study was concerned with examining the valuation methods that could provide a reliable estimate of a restaurant's market value. Two valuation methods, the RIM and multiples valuation models, were selected for this study and compared based on valuation errors. The RIM was chosen as representative of a present valuation model, and is commonly used by theoretical researchers. In contrast, the multiples valuation models are commonly used by real world practitioners, such as analysts. Both valuation models were compared based on the valuation accuracy and the performance of valuation, and in this way the more effective method was determined.

As a result, the absolute value of valuation errors for the multiples valuation models was less than that for the RIM. This indicated that the multiples valuation models estimated values more accurately and their estimations were less biased than those of the RIM. The value of the fraction within 15 percent for the multiples valuation model was greater than that for the RIM. This suggests that the multiples valuation models provided more precise estimations and thus performed better than the RIM.

Moreover, this study extended the research about the multiples valuation model. Four multiples – P/E, forecasted P/E, EV/EBITDA, and EV/Book value – were selected for this study. Each multiple was compared based

on the valuation errors to determine the most reliable multiples for restaurant companies. The mean valuation error of the book value multiple showed that the book multiple overestimated market values the most, indicating the book value multiple has the most biased estimations among the four multiples. Compared to the mean valuation errors, the P/E multiple has less biased estimations than the forecasted P/E multiple. This showed that the P/E multiple predicted the value more precisely than forecasted P/E, in contrast to the findings of Liu et al. (2002) and Kim and Ritter (1999). The EBITDA multiple had the lowest percentage of valuation errors among the four multiples, which indicated that among the four multiples the EBITDA multiple estimates were closest to the market value.

To estimate the performance of valuation models, the multiples were also compared by the fraction within 15 percent of valuation errors. The fraction within 15 percent of EBITDA was greater than that of other multiples. This indicated that the EBITDA provided more accurate estimations than did the other multiples. In other words, the variation in the valuation errors was lowest for the EBITDA multiples, suggesting that the accuracy was less varied across restaurant companies. The values of the fraction within 15 percent of the P/E multiple, and that of the forecasted P/E multiple, were not significantly different. This result showed that both multiples had a similar performance, and both multiples valuation models provided similar number of accurate predictions. This finding also contrasted to the studies of Lie and Lie (2002), Liu et al. (2002), and Kim and Ritter (1999), which claimed that the forecasted earning multiple performed better than the historical earnings multiple. Among the four multiples employed, the

book value multiple had the lowest fraction within 15 percent, which indicated that it performed worst among the four multiples.

In sum, the EBITDA multiple estimated the restaurant value more accurately, and performed better than other valuation models. Historically, the restaurant industry has used EBITDA as the benchmark for establishing valuation (The Cypress Group, 2010). Moreover, the restaurant industry has also struggled with low sales growth and low profit margins, and because the EV/EBITDA multiple requires prudent use for companies with low profit margins, especially when the companies were undervalued (Wikipedia, 2012), EBITDA might be considered to be reasonably accurate in its estimations. Moreover, this result is contrary to the findings of other studies which concluded that the forecasted earnings multiples or the asset multiples estimated more accurately.

Although the EBITDA multiple and P/E multiple predicted the market value for restaurant companies well, overall estimates were still undervalued by the valuation models. To demonstrate the undervaluation of restaurant companies, this study compared the distribution of valuation errors for the valuations models. Consistent with previous results, multiples valuation models overall performed better than the RIM, and the EBITDA multiple performed the best among the five valuation models. In addition, more than 53 percent of estimates, based on the RIM and the multiples valuation models, were undervalued. In particular, the RIM and the forecasted multiple yielded more undervalued estimations than the other valuation models. Both models, the RIM and the forecasted P/E multiple, predominantly used the forecasted data estimated by Bloomberg analysts. This finding showed that financial analysts tend to underestimate restaurant stocks.

The findings of this study will have implications for researches in the restaurant industry. First, as mentioned before, there have been few stock valuation studies with particular relation to the hospitality and restaurant industry. This study will help to fill the gap in stock valuation research in this area. Furthermore, by comparing the multiples valuation model and the present value model, this study demonstrated that the multiples valuation models were more reliable than the RIM for application to the restaurant industry. In addition, this study examined the phenomenon of undervaluation of restaurant stocks, and considered the distribution of valuation error for each valuation model. It found evidence to suggest a tendency for analysts to undervalue restaurant stocks.

In addition, the findings of this study will also have implications for analysts and potential investors in the restaurant industry. In suggesting the EBITDA multiple as an effective valuation model, this study can assist analysts valuing restaurant companies and provide another investment strategy for investors in the mispriced restaurant market. This study also encourages analysts to be aware and informed about the evidence of the undervaluation of restaurant stocks.

5.2 Limitations and Future Studies

The first limitation of this study is due to the sampling procedure. The Bloomberg and FactSet databases were used to collect data. However, the availability of historical data and forecasted data was extremely limited for restaurant companies. In future studies, the sample size could be enlarged by using different databases, and the time period covered could also be expanded.

The second limitation of this study was the sample. As documented in the literature, having a sample of companies that are dissimilar in terms of size and operating characteristics presents challenges to the research model. The lack of peer group companies with equal operating and financial characteristics, the difference in inter-country accounting and regulation, and fluctuations in accruals or cash flows would bring various multiples into play and could lead to mispricing of samples (Schreiner, 2007). This study did not consider and divide the sample based on size or earnings. By selecting different restaurants as a sample, the result could have been different. In future studies, the sample of restaurant companies should be divided based on their financial characteristics and compared by multiples.

Lastly, the precise reasons for the undervaluation of restaurant stocks were not investigated, and remain unclear. It is hoped that future research will help to identify the factors that lead to the undervaluation of restaurant stocks.

Based on the findings of this study, the several questions for the future studies of restaurant valuation are offered for consideration:

1) Instead of a single multiple method, does the combination of multiples provide a more accurate estimate for restaurant companies?
2) Are there particular reasons for the fact that the EBITDA multiple was reliable for restaurant stock valuation? Are there other multiples which could estimate more accurately than the EBITDA multiple?
3) How effective is the EBITDA multiples model in estimating restaurant stocks?

4) Does the EBITDA multiple perform and measure value more accurately for small or large sized restaurant companies?
5) Does the EBITDA multiple perform and value differently according to the level (low, medium, high) of earnings of restaurant companies?
6) What are the main reasons for undervaluing restaurant stocks?

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