2010

Excess Return Estimate and Risk Factors in Hospitality Firms

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EXCESS RETURN ESTIMATE AND RISK FACTORS IN HOSPITALITY FIRMS

A Thesis Presented

by

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Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE

February 2010

Department of Hospitality and Tourism Management

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ACKNOWLEDGMENTS

I am indebted to many persons in writing this thesis. First and foremost, I should thank Professor Atul Sheel, my thesis committee chair, for his guidance throughout my studies. His encouragement supplied the power required for me to get through hard times and to move toward the goal. I would also like to thank the members of my committee, Professor Robert H. Wilson and Linda K. Enghagen for their useful suggestions and patience with my progress.

There are many other persons who have made my life at UMass Amherst enjoyable. Professor Linda Shea was the warmest and most supportive mentor I have ever met. I also want to thank my friends, Jeremy Vight, Iris Chelaru, Dan Cheng, Genta Ramaj, Ergys Islamaj, Jinhoo Kim, Nazende Gunday and Sian Fennessey. They have been beside me in good times and bad times, always giving me great friendship. Thank you all.

I dedicate this thesis, my first official academic paper, to my parents, Janaq and Andoneta Lagji. Given the amount of their love, support, encouragement, and expectation, I should write and dedicate more and better papers to them.

ABSTRACT

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FEBRUARY 2010

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Calculating the expected return has been a longstanding issue in the finance. There is a positive correlation between the undertaken risk and excess return (or loss) but numerous variables need to be considered. This study builds on the Fama and French formula and adds factors unique to the hospitality industry such as labor cost and diversification in order to get results that are a tailored to the hospitality industry. Active hotel and restaurants companies (SIC 7011 and 5812 respectively) in the 2000-2009 period were analyzed in separate samples. The labor cost improves the explanatory on both samples and the diversification proxy was significant in the hotel sample. Based on the results suggestions for further research were made.

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CHAPTER 1

INTRODUCTION

The hospitality industry is often associated with high startup costs, very high labor costs and one of the first industries to be influenced by economic downturns since it is based on derived need (Lim, 1997). The higher risk in this industry is substantiated by the fact that the majority of small startup companies such as restaurants go bankrupt within the first 5 years. Various authors try to come up with techniques to predict the future performance of companies (Kim & Gu, 2006) but a firm's performance is influenced by a large number of internal and external factors therefore the reliability of such techniques is limited. The general accepted conceptual models such as the Capital Asset Pricing Model (CAPM) do not describe what happens in the real market in a satisfactory way and further, it is difficult to find what factors really matter in the hospitality industry. Further complications result from the fact that statistics tools used in most sciences do not have the same reliability properties in the finance world (Mandelbrot & Hudson, 2004). Various authors have researched industry-specific characteristics but no publication covers a wide range of the hospitality subsectors. The products of hospitality companies have various common characteristics; they depend on the traveler's desires, needs and purchase power, they cannot be stored and sold later, known as the product perishability, and they are usually consumed on the premises where they are produced. The hospitality companies are likely to have tangible measurable characteristics that can be used to estimate their risk. This study considers the best known practice and its shortcomings and then looks for adjustments specific to the hospitality industry to improve risk estimates.

CHAPTER 2

LITERATURE REVIEW

What is Firm Risk

Webster's dictionary defines risk as "a hazard; a peril, exposure to loss or injury." Financial risk is associated with the probability of losses, the greater the chance of loss, the riskier the investment (Brigham & Gapenski, 1997). The way how risk is measured is still open to discussion; the historical approach has been to get past data and calculate the probability of future returns using standard deviation. The tighter the probability distribution of future returns the lower the risk. Statistics show that the chances of the result being within 1 standard deviation are 66.7%, within 2 standard deviations are 95% and within 3 standard deviations are 98%.

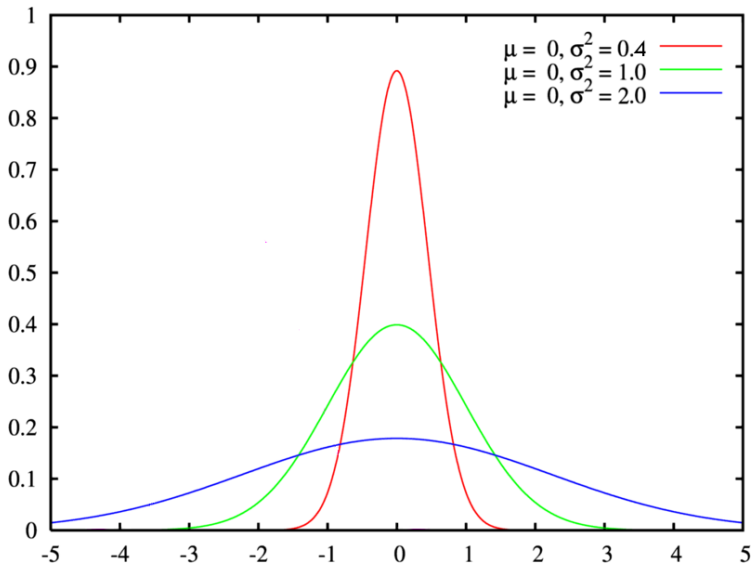

Figure 2.1: Normal Distribution Curves

In the early 50s the norm was to evaluate a company on its own independently of the environment it operated thus a non realistic approach. Calculating the risk that way is limited and does not have much practical use for various reasons. Public companies are much larger than traditional mom-and-pop companies and can have smaller independent divisions such as catering or lodging. Companies can have operations in different regions with possibly different risks.

Analyzing only the company without considering the environment in which it operates is useful when taking a theoretical, micro point of view. When it comes to investors, they usually own a portfolio of different stocks and the risk of the portfolio can be significantly less than the risk of its individual components. Similarly to having independent divisions within a company, owning portfolios could reduce risk further since the firms in a portfolio can be in completely different industries. In order to determine how risky a firm is investors usually take the probabilistic approach (Beenhakker, 1976); they are unable to predict exactly what is going to happen in the future but they analyze several possible outcomes with stated probability. As mentioned above, by having a portfolio of companies in different industries, preferably distributed geographically, it is possible to minimize the impact of a large number of external factors. Portfolio risk is analyzed in the CAPM theory (Sharpe, 1964) that is still commonly used in both financial management and investment analysis. CAPM theory has its roots in the Modern Portfolio Theory (MPT), a term brought by Markowitz (1952). There is a tradeoff between the expected return and the risk and the optimal relationship is represented by the Efficient Frontier line.

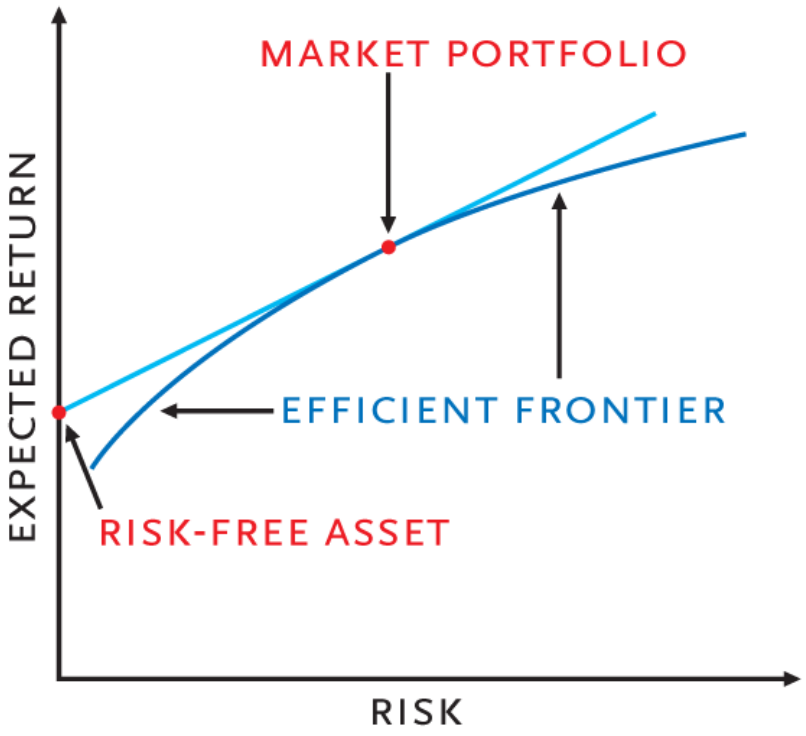

Figure 2.2: Efficient Frontier Line

One major shortcoming of the MPT model was the number of required computation steps. In order to find the overall portfolio variance the investors need to calculate the variance of each investment and the correlation between those investments. As portfolios grew, the number of calculations grew geometrically. The Capital Asset Pricing Model does not have this issue because it has two portfolio-independent points of reference, the market risk and the risk free asset. In applied CAPM analysis the market risk is often calculated using the S&P 500 companies and the risk-free asset is usually represented by government bonds because the chances of a government defaulting on its bonds are practically zero. Fama and French (1992) improved this formula by adding proxies (SMB, HML) that are very statistically significant. The CAPM defines risk as the covariability of the security's returns with the market's returns. The risk of companies of portfolios is expressed by the beta, and it is calculated by the following formula:

$$\beta = \frac{covariance(R_m, R_j)}{Variance(R_m)}$$

Where:
β= Beta
Rm = Return of the market
Rj Return of the stock J

Both MPT and CAPM are based on efficient markets assumption and consequently have a somewhat limited practical use (Brealey, 2006). CAPM is widely accepted in the academic area but not as much within the industry (Harrington, 1987).

The degree of risk has a strong impact not only on the investor's returns but also on the future performance of the company due to its effect on the incoming flow of capital and resource allocation during investments decisions. Financial risk is correlated with financial variables such as acid ratio or profitability and external factors such as economic situation, consumer preferences and ultimately investor's preferences. Perceived risk, a term brought by Bauer (1960) is important in the service sector. Risk perception is composed of two parts that are equally important; the intangible personal risk tolerance and the more tangible and quantitative financial risk part.

Personal Risk Tolerance

This is something that is related to one's personality, current financial situation and culture. There has been a great deal of research on this topic and the evidence shows that the human decision making process is based on both objective factors such as the beta or the company's financial figures and subjective, personal factors such as the degree of risk-averseness. Various researchers, such as Downling and Staelin (1994) look at overall perceived risk. What an

investor perceives as relatively risky might be relatively safe for another. Mehra and Prescott (1985) researched this topic and they found something interesting that defies the common logic; the high risk premium earned in the market seems to imply that investors are risk-averse, and they ought to cut back their consumption when stock prices fall and wealth decreases. Evidence shows that when stock prices fall investors continue to spend at almost the same rate. This behavior might be explained by considering both the current situation and the expected future situation. Investors consider the present situation but are actually more interested in the future outcome and if they have reasons to believe that the stock prices will increase they will keep investing. Further, investors know that by not investing they will lose money at the current inflation rate and they will be forfeiting any possible profit. The same logic can also explain why some investors cut spending during exceptional severe crisis such as the current one; when they believe that the worse is still to come they try minimizing their exposure by withholding new investments. Research also shows that investment decisions are often made by small groups, not just by individuals. The differences in decision making between groups and individuals cannot be explained by simple aggregation of individual preferences or choices or by simple theories of group decision making (Kocher & Sutter, 2005). These group interactions resemble beauty-contest games mentioned by Keynes (1936) where the outcome is not necessarily straight forward. Bornstein and Yaniv (1998) have studied individual versus group behavior in a standard, one-shot ultimatum game, where a fixed amount of money "c" is split between a proposer and a responder. If the responder accepts the proposer's offer x, he gets x and the proposer keeps c - x. However, if the responder rejects the offer, both get nothing. Bornstein and Yaniv compare two samples, one with individuals playing against individuals and one with groups playing against groups. Their main finding is that groups are more rational players than individuals by demanding more than individuals in the role of proposer and accepting relatively lower offers in the role of responder. The group behavior seems to match the behavior of institutional investors, since they are generally better informed, have greater access to company information and are in a position to

monitor the performance of corporate managers more effectively (Oak & Dalbor, 2008). The human factor of the decision making process is very important but this study focuses on the more tangible aspect that can be measured with objectivity and uses the public financial information of these hospitality industry companies.

Objective And Quantitative Part

This is the objective risk figure that finance researchers attempt to calculate as accurately as possible. There are different theories and the tools are constantly evolving. It started with the individual firm or micro focus and evolved to more complex theories such as the CAPM theory. Fama and French (1993, 1996) have suggested that the CAPM theory is not very reliable and events that were previously considered highly unlikely are happening far more often than predicted. Fama and French are strong criticizers of the CAPM theory, their "beta is dead" paper (Fama & French, 1993) created a great deal of controversy. Other authors such as Kothari and Shanken (1995) oppose the Fama and French (1993) findings. Kothari and Shanken analyzed Fama and French findings and found some possible limitations based on the sample data but recent economical events bring additional support to Fama and French suggestions.

Research from the last century shows that overall people who risked benefited more in the long term (Dimson, Marsh, & Staunton, 2002). This does not necessarily mean that taking more risk would always mean higher returns. For example many companies during the current crisis lost capital and some even went bankrupt (Sorkin, 2008). The study of Dimson et al (2002) is based mainly on the data from US companies, partial data on their study (Dimson, et al., 2002) and research from other authors (Jorion & Goetzmann, 1999) show a different picture in other countries for various reasons.

Risk related literature in main stream/conventional finance

Risk related research has been mostly based on the CAPM theory. This theory has been the overall framework where a large number of books and articles are based from the late 90's. Companies use CAPM based strategies for active risk management programs to keep their risk at

desired levels, i.e. they introduce new products or services that have different sensitivity to economic factors. To reduce risk banks offer insurance or other securities. Interestingly, Allen & Jagtiani (2000) found that engaging in these type of activities is not necessarily a positive thing. Such practice reduces the firm risk on various investments but increases the systematic risk because it decreases the ability of firm to diversify. Banks invest in assets that due to the information-sensitive nature cannot be traded frictionless in the capital market. They have a relatively fixed capital structure and minimize risk exposure using risk management programs. Since banks have a fixed capital structure, they have two main ways of controlling exposure to risk; they hedge transactions in the capital market and when this approach is not feasible they alter the investment policies (Froot & Stein, 1998). Cebenoyan and Strahan (2004) found that banks that engage in both selling and buying loans as part of their risk management program gain substantial benefits. These banks are able to hold a lower level of capital per dollar of risky assets than banks not engaged in loan buying or selling. Moreover, banks that are on both sides of the loan sales market also hold less capital than either banks that only sell loans but do not buy them, or banks that only buy loans but do not sell them themselves. Banks often engage in interest-rate derivative products. Brewer , Minton & Moser (2000) found that banks using interest-rate derivatives experience greater growth in their commercial and industrial loan portfolios than banks that do not use these financial instruments. Recent economic events illustrate a different story and they are not covered by previous studies. These events are more frequent than what was believed based on the CAPM theory and during the last crisis several banks lost fortunes and even declared bankruptcy (Sorkin, 2008). Hospitality companies also engage in hedging operations (Singh & Upneja, 2007) to lower their cost of capital. The cost of capital is an important factor in the success or failure of an enterprise. Especially in the hospitality industry the effects of the cost of capital are severe because of the seasonality and the overall high capital requirement. Seasonality not only harms the effective use of the faculties but also raises the solvency risk, therefore the overall risk of the companies. Further, hospitality facilities have unique

characteristics, i.e. they cannot be modified easily (Andrew & Denizci, 2005). Hospitality operations are very labor intensive due to the very nature of their products and they cannot be outsourced to cheaper markets. These characteristics affect the riskiness of the company and they need to be considered when analyzing the risk of companies. When comparing various theoretical models the Fama and French 3 factor model is more accurate than CAPM in the measure of risk and although it is more complex to calculate due to the additional proxies, it can explain some of the abnormalities of CAPM (Fama & French, 1996, 2003). Additional proxies addressing these unique characteristics of the hospitality companies could be added to the Fama and French model.

Risk Related Literature For The Hospitality Industry

Until recently, research on this topic was focused more on the general economy with little focus on the hospitality industry. Although we know that in a perfect market the capital structure is not important (Modigliani & Miller, 1958) the presence of regulations needs to be considered and the capital structure may affect the systematic risk of the company. Changes in risk can influence the cost of capital and thus in the feasibility analysis of different projects. Authors like Choi (1997) have summarized some of these topics but more research could be made. For example Chen (2003) in her study on the risk of restaurants discovers that the relationship depends not only in expected factors such as financial ratios but also on the type of properties such as full service or limited service. Chatfield and Chatfield (2003) found that firms in the hospitality industry were paying higher returns for the same kind of bonds that were offered by firms in other industries resulting in a higher overall cost of capital. Gu and Kim (2002) showed that the beta of restaurants is positively related with quick ratio but negatively related with assets turnover, in their sample firms with higher assets turnover have lower betas.

A possible explanation could be that the high asset turnover is a safety margin in case of decreased demand. Gu and Kim have done extensive research on the restaurants, in two other related studies they investigate the possibility of predicting a bankruptcy in the restaurant

business (Gu, 2002; Kim & Gu, 2006). Restaurants and casinos are a large part of the hospitality industry but this study takes a more general approach and includes hotel companies as well.

Asset pricing theories have not been clear about what type of events are more likely to influence all assets or specific sets of assets. It is also expected that some variables affect the hospitality industry more than the other industries. Barrows and Naka (1994) investigated the relationship between macroeconomic variables and the hospitality stock prices in the US market. They found that inflation, money supply and domestic consumption were able to explain the movement of restaurant stock returns better than the lodging and industrial sectors. Hospitality industry stock returns for the 1965-1991 periods had a negative relationship with the inflation rate, but a positive relationship with the money supply, and domestic consumption. Barrows and Naka focused on the restaurants and did not define any variables that may have an effect on the general hospitality industry's risk. These variables are extremely important for the potential investors and providing them makes investing in the industry more attractive. Overall, disclosing qualitative and quantitative market risk information is good business practice and often required (Abdelghany, 2005). Since the capital structure and the operation ratios of the lodging companies are quite different from other industries, research on this topic is needed. Gu and Kim (1998) investigated the risk of 35 casino firms for the 1992-1994 period. They analyze several variables such as current ratio, leverage ratio, asset turnover, and profit margin to explain casino firms' systematic risk. They found that asset turnover ratio was significant at $p = 0.10$ level and all other ratios were not significant. On their latter study with Mattila, (Kim, Gu, & Mattila, 2002) they investigated the risk of 75 restaurant firms for the 1996-1999 period. They found that liquidity and asset turnover ratio explained 31 percent of the variation in the restaurant firms' systematic risk (Chen, Roll, & Ross, 1986). Similar to Barrows and Naka (1994), studies conducted by Borde (1998), Gu and Kim (1998; 2002) did not attempt to identify variables that may affect the general hospitality industry's systematic risk. Borde (1998) studied restaurants and for his sample he found that liquidity, dividend-payout ratio, ROA and growth

explain almost half of variation. Research on hospitality REITs (Kim, et al., 2002) found that 84% of the firms' total risk was contributed by firm-specific, unsystematic risk. This can have very significant impact on the cost of capital and the overall bottom line. Sheel (1994) found that lodging companies use past profit trends to decide on short term debt policy. Long term debt policy on the other hand is based on the tax shields to reach an optimum leverage. Inflating debt to increase the financial leverage will benefit the stockholders in the short term but will also increase fixed expenses and can hurt operation leverage. Operation leverage is considered as the second most important determinant of the beta according to Brealey, Myers and Allen (2006). Singh (2009) found that that the majority of lodging firms prefer to maintain a debt structure that is comprised largely of fixed rate debt relative to floating rate debt. The income statement related figures are not the only variables to consider because the accounting determined risk is not necessarily the same as the market determined risk (Beaver, Kettler, & Scholes, 1970). Usually investors are more interested in the market risk. Different authors have interesting views about the validity of the beta in the real life market. In an unusual contest, to test the effectiveness of our financial tools in forecasting, the performance of prominent equity analysts was compared with the performance of journal staffers throwing darts. The result; "The darts out-performed the analysts on a nominal and risk-adjusted basis during the recent market decline, with darts and analysts generating higher nominal and risk-adjusted returns than the market index fund" (Porter, 2004). Considerable research has been made on this topic by Mandelbrot & Hudson (2004) and they strongly criticize the reliability of the beta. Since the '60s there have been reports that the reality does not really support the theory, for example Fama et al (1969) say that the distribution of beta is not standard as we think but rather fat-tailed. This has important implications on the risk assessment. Companies often try to optimize the timing of the transactions to looking at patters but if the distribution is fat-tailed the overall model is broken. These companies normally perform well during normal economic times (Anderson, 1997) and there are authors that suggest techniques for better results (Aby & Vaughn, 1995) but this is not necessarily a preferable

approach when the economy is unstable. Bower et al (1984) compared the CAPM and the Arbitrage Pricing Theory (APT) in utility stock returns and concluded that the APT provides a different and better measure of risk through time and across assets. Fama and French proposed the 3 factor model that yielded better results but was not as practical because of extra steps required. They analyzed the impact of book to market factors (Fama & French, 1995) but the results were not definitive. In another study (Fama & French, 1993) studied the effects of different factors on stocks and bonds as well and they identified variables that did not have a particular role in the CAPM theory had explanation power on the cross-section average of returns. L'Her et al. (2004) found that book to market factor returns are positive and highly significant in down-markets but are in up-markets they are negative and barely significant. In this study we will consider the book to market value of the specific sample generalizing the findings to the hospitality industry. The timing of measurement of various factors may play an important role (Jordan, 1973) and that will be taken into account. Handa et al (1989) found that the annual beta estimates were significantly correlated with both monthly and annual average returns. But Levhari and Levy (1977) showed that beta coefficients estimated with monthly returns are not the same as betas estimated with annual returns. Various researchers such as Fama and MacBeth (1973), Black et al (1972) and Fama French (1993) used monthly return data to examine the risk and return relationship. It appears that the choice of using monthly returns is a result of data availability. Kothari et al (1995) argued that annual betas are better than monthly betas, the main reason being the length of the investment horizon for a typical investor which according to their research it is closer to a year than a month. They demonstrated that the relationship between beta and returns is stronger when betas are estimated using annual returns. Bartholdy and Peare (2005) found that betas obtained from monthly data during a period of 5 years yield better results. Interestingly they found that using equally-weighted index is better than the commonly recommended value-weighted index. This study estimated the Fama-French three factor model using the annual returns. Another benefit of using annual returns is the elimination of some of the

statistical complications that occur due to the significant seasonal component associated with monthly returns (Kiymaz & Berument, 2003; Rozeff & Kinney, 1976). Computing beta estimates using monthly returns can introduce biased as a result of trading frictions, non-synchronous trading which induce systematic cross-sectional covariance in short interval returns (Mech, 1993; Kothari, et al., 1995).

CHAPTER 3

RESEARCH PURPOSE

This research takes an empirical approach to help the decision making process of investor. The objective is to discover general measurable risk factors in the hospitality companies assuming ceteris paribus. Previous studies have focused on specific subsections of the hospitality industry, for example restaurants (Borde, 1998; P. Chen, 2003; Gu & Kim, 2002), hotels (Choi, 1997; Kim, et al., 2002)or casinos (Gu & Kim, 1998). The Fama French 3 factor model (Fama & French, 1993) is able to explain some of expected return by using the SMB and HML proxies but does not take into considerations any of the special characteristics of hospitality industry. We know that different industries and regions have different characteristics (Shum & Tang, 2005) and not all financial variables have the same relevance.

This research uses an improved formula and tries to capture some of the specific risk related to the general hospitality industry (both hotels and restaurants) that can be used in multiple situations. It can be important for the investor when evaluating investment options and it can make the hospitality industry more attractive. Similarly, it is important for management in order to properly evaluate the position and value of the company.

CHAPTER 4

HYPOTHESES, DATA, AND METHODOLOGY

Research Design and Methodology

Data collection methods

Annual data for the period 2000-2009 (fiscal years 1999-2008) were collected from COMPUSTAT Fundamental Annual database via the Wharton Research Data Services (WRDS) database for both lodging and restaurant firms. The sample consisted of hotels/motels, limited service restaurants and full service restaurants. Standard Industrial Classification (SIC) codes 5812 (Eating Places) and 7011 (Hotels and Motels) were used. Firm specific data included financial figures from the balance sheet, income statement and supplemental and miscellaneous categories. The risk free index was retrieved from the Fama and French Data Library. The Dunn & Bradstreet (D&B) Million Dollar Database was used to obtain the business line and SIC codes for the diversification proxy.

Sampling and data analysis methods

The data was separated in two different sets based on the SIC codes. For each set the small minus big (SMB) and high minus low (HML) factors were calculated based on the Fama & French (1993) paper. The median of market value was used to separate firms in big and small and the ratio of book value to market value was used to rank the firms as high, medium and low. The book value was calculated as the book value of stockholders' equity, plus balance-sheet deferred taxes and investment credit, minus the book value of preferred stock. Preferred stock was calculated depending on the availability of redemption, liquidation and par values. Firms with missing or negative book to market equity ratios were removed from the sample. For each year the bottom 30 percent was ranked as low, the middle 40 percent was ranked as medium and the

top 30 percent was ranked as high. On the hotel dataset three outlier firms were removed[1]. Returns were calculated as:

$$r = (p1 - p0 + d0)/p0$$

Where:

r = returns for the fiscal year 1

p0 = Price Close Annual Fiscal on year 0

p1 = Price Close Annual Fiscal on year 1

d1 = Dividend paid on year 1

For the year zero where the closing price for previous year was not available, the average of the Price High Fiscal and Price Low Fiscal was used. The firms in the restaurant sample firms were divided in six portfolios SL, SM, SH, BL, BM and BH based on their size (small or big) and book to market ratio (low, medium and high). Weighted returns based on the firms' market value were calculated for all portfolios. SMB was calculated as the difference between the simple average of the three small-stock portfolios (SL, SM and SH) and the three big-stock portfolios (BL, BM and BH). This variable proxies for effect that size (market value) has on the returns and should be free of the bias that could be introduced by the BE/ME ratio. HML was calculated as the difference between the simple average of the returns of the two SH and BH portfolios and the two SL and BL portfolios. This variable captures the book to market ratio effect on the returns and by using both small and big firms it is possible to eliminate the size effect. The hotel sample was significantly smaller (96 hotel cases versus 492 restaurant cases) and it was not possible to construct six different portfolios in most of the years analyzed. For this reason, in the hotel sample the average[2] of the yearly book to market equity was used to divide firms in two groups,

[1] The following firms were removed from the hotel sample: China Aoxing Pharma Co, Santa FE Financial Corp (only 2 employees), Intergroup Corp (only 12 employees).

[2] Using average as the cut-off point yielded better results than using the median.

high and low. SMB was calculated as the difference between the simple average of the two small-stock portfolios (SL and SH) and the two big-stock portfolios (BL and BH). HML was calculated as the difference between the simple average of the returns of the SH and BH portfolios and the SL and BL portfolios. For both SMB and HML, on years where one of the portfolios was missing, the remaining portfolio was used as the only unit to calculate the proxies. For the full list of variables, see Appendix C and D.

The data was analyzed with SPSS program version 17. Correlation and regression statistical tools were used to see the relationships between the variables. This study analyzed a sample of 85 companies representing most of the active public companies in North America operating in under the SIC codes of 7011 and 5812.

The coefficients of Fama-French three factor model are estimated as follows:

$$r_{it} - r_{ft} = \alpha_i + b_{mt}(r_{mt} - r_{ft}) + b_{SMB}SMB_t + b_{HML}HML_t + \varepsilon_{it},$$

Where:
r_{it} = return on asset i at time t
r_{ft} = return on the risk free asset at time t
α_i = intercept term
b_{mt} = beta coefficient of the excess return on the market
r_{mt} = return on the market portfolio at time t
b_{SMB} = beta coefficient of the size proxy
SMB_t = size proxy
b_{HML} = beta coefficient of the book to market proxy
HML_t = book to market proxy
ε_{it} = error term

In the second step, the specifics b_{P1} and b_{P2} for the hospitality industry and related proxies are identified and included in the modified Fama-French three factor model to examine whether with the addition of these factors would yield an improvement in the estimation of the hospitality industry's risk and its expected return.

$$r_{it} - r_{ft} = \alpha_i + b_{mt}(r_{mt} - r_{ft}) + b_{SMB}SMB_t + b_{HML}HML_t + b_{P1}P1_t + b_{P2}P2_t + \varepsilon_{it}$$

Where
r_{it} = return on asset i at time t
r_{ft} = return on the risk free asset at time t
α_i = intercept term

b_{mt} = beta coefficient of the excess return on the market
r_{mt} = return on the market portfolio at time t
b_{SMB} = beta coefficient of the size proxy
SMB_t = size proxy
b_{HML} = beta coefficient of the book to market proxy
HML_t = book to market proxy
b_{P1} = beta coefficient of the labor proxy
P1 = hospitality industry labor proxy
b_{P2} = beta coefficient of the diversification proxy
P2 = hospitality industry diversification proxy
ε_{it} = error term

The coefficients of each variable in the regressions are tested to assess if the betas are significantly different from zero at the p=0.05 level. To test the hypothesis of the study, ANOVA tests are run to examine whether beta coefficients of the hospitality industry related proxies were significantly different from zero at the p=0.05 level. Prescreening analysis was run to find industry specific relevant variables. The input of the prescreening was used to adjust the research hypothesis.

Research Hypotheses

The hospitality industry has unique properties, i.e. it is very labor intensive and it cannot adjust easily to changing demand. The ratio of number of employees to market value in the hospitality industry divided by the ratio of number of employees to total market value in another industry is used to capture the effect of labor cost. Arbitrarily the manufacturing industry was selected and twenty different SIC codes pertaining to the manufacturing industry (Appendix A) were used. The direct figure of labor expenses would have been a better measure than the number of employees but unfortunately less than half of the companies reported that figure in their income statements. The number of employees and labor expenses are correlated at a=0.000 level, (the Pearson's correlation is p= 0.985) so the number of employees is an excellent substitute.

$$P1 = \frac{\frac{E_h}{M_h}}{\frac{E}{M}} = \frac{E_h}{E}\frac{M}{M_h}$$

Where:
P1 = Labor expense proxy
E_h = Number of employees of the company in the hospitality industry.
M_h = Market value of the company in the hospitality industry
E = Number of employees of the company in the manufacturing industry
M = Market value of the company in the manufacturing industry

This ratio can capture the labor related cost savings that hospitality firms cannot achieve by outsourcing the service component of their business. This extra cost becomes a burden; in favorable economic situations it is not easy to increase the labor force quickly without sacrificing quality and in less than favorable economic times it is not simple to downsize because the hospitality industry is very labor intensive. The labor cost in the hospitality industry becomes a forced cost different from other industries and should have a negative effect on returns. The hospitality industry firms can utilize "limited outsourcing" compared to the manufacturing industry. They can outsource simple services like housekeeping or security to other firms in the local area but hospitality companies cannot outsource to totally different geographic markets such as China or India for saving costs. Such lack of outsourcing ability could influence the values of the beta and the coefficients in the Fama and French 3 factor model.

The labor cost related proxy adds to the explanatory power of the Fama & French equation

The labor cost related proxy adds additional explanation power to the modified Fama French equation. By including the labor proxy we can explain better the extra returns in the hospitality industry.

H1 (0): The labor cost related proxy does not add any additional explanation power to the modified Fama & French equation.

H1 (A): The labor cost related proxy adds additional explanation power to the modified Fama & French equation.

Another way to reduce the risk of any portfolio is to diversify (Markowitz, 1952). Similarly to portfolio diversification, firms can decide to diversify in order to reduce the dependency on a specific market by investing in other markets. It is possible for firms to diversify in completely unrelated sectors and markets but that does not tend to happen often since it requires a different of knowhow and firms would not benefit from economies of scale. To capture the diversification factor, this paper uses the number of the lines of business (SIC codes) the company is operating in. A company with only one SIC code would have a diversification index of one. The line of businesses was obtained from the D&B's Million Dollar Database and includes operations in restaurants, timeshare, hotel, health products, amusement etc (Appendix B). Firms with lower diversification index might have a more variable income thus their returns can be significantly different from the risk free asset r_{it}. A negative relationship between the diversification and the extra returns is expected. To check this relationship this paper uses the difference between the return on the firm at time t express by r_{it} and the risk free asset at time t expressed by r_{ft}.

The diversification proxy adds to the explanatory power of the Fama & French equation

Diversified firms might have a lower systematic risk because they have multiple revenue sources. This can have an impact on the returns of the firms in the hospitality industry.

H2 (0): The diversification index proxy does not add any additional explanation power to the modified Fama & French equation.

H2 (A): The diversification index proxy adds additional explanation power to the modified Fama & French equation.

Another focus point of this research is the information analyzing process of the investors and what available figures they generally consider relevant. During the evaluation of a company investors consider several variables and the capital structure of the company could have an impact on the investor's perception, thus on the stock price of the company. Capital structure data is commonly available and possibly one of the first factors to be considered. Borde (1998), Gu and Kim (1998, 2002) and Chen (2003) found that the beta of companies is correlated with balance sheet and income statement figures such as quick ratio and ROA. It is interesting to see whether including ROA helps in the estimate of the excess return (or loss) of a company.

The return on asset ratio (ROA) adds to the explanatory power of the Fama & French equation

Return on asset ratio (ROA) is positively correlated with the beta of a company and it might be used by investors as a figure of the financial performance of the company. The stock price and returns of a company depends largely on supply and demand; it is interesting to see if ROA would add additional explanatory power to the estimate of extra returns.

H3 (0): The ROA proxy does not add any additional explanation power to the modified Fama & French equation.

H3 (A): The ROA proxy adds additional explanation power to the modified Fama & French equation.

CHAPTER 5

RESULTS

Overall results support the suggestions that adding industry specific proxies can help in the explanation of extra returns. The labor proxy was very significant on both samples studied and added explanatory power to the original Fama & French equation. The diversification proxy was not as significant although it shows promise; it was significant at the p=0.024 level for the hotel sample but only significant at the p=0.113 level for the restaurant sample. The ROA proxy was not significant in the explanation of extra returns. The ROA proxy results were consistent on both samples.

Labor and Diversification Proxies

As a first step correlation tests were run on both samples to see the relationship between the variables and the labor and diversification proxies. On a second step the significance of the ROA proxy is explored. The restaurant sample is the first analyzed.

Table 5.1: Restaurant Sample Correlation Matrix

		Extra Returns	Extra Market Returns	HML	SMB	Diversification Proxy	Labor Proxy
Extra Returns	Pearson Correlation	1	.179**	.156**	.210**	-.056	-.165**
	Sig. (2-tailed)		.000	.001	.000	.259	.000
	N	492	492	492	492	414	492
Extra Market Returns	Pearson Correlation	.179**	1	-.104*	.133**	.016	.097*
	Sig. (2-tailed)	.000		.021	.003	.744	.031
	N	492	492	492	492	414	492
HML	Pearson Correlation	.156**	-.104*	1	.172**	.023	-.193**
	Sig. (2-tailed)	.001	.021		.000	.644	.000
	N	492	492	492	492	414	492
SMB	Pearson Correlation	.210**	.133**	.172**	1	.002	-.105*
	Sig. (2-tailed)	.000	.003	.000		.968	.020
	N	492	492	492	492	414	492
Diversification Proxy	Pearson Correlation	-.056	.016	.023	.002	1	-.074
	Sig. (2-tailed)	.259	.744	.644	.968		.133
	N	414	414	414	414	414	414
Labor Proxy	Pearson Correlation	-.165**	.097*	-.193**	-.105*	-.074	1
	Sig. (2-tailed)	.000	.031	.000	.020	.133	
	N	492	492	492	492	414	492

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The matrix shows that the correlation is significant at the p=0.000 level between the extra returns, SMB, extra market returns and the labor proxy. HML is very close at the 0.001 significance level. The correlation of the diversification proxy is not significant (p=0.259). After examining the correlation matrix a regression test was run. The original Fama & French equation for the restaurants sample is significant at the p=0.000 level but can explain only 8.3 percent of the variance.

Table 5.2: Restaurant Sample Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.288[a]	.083	.076	64.3429722
2	.340[b]	.115	.105	63.3469606

a. Predictors: (Constant), SMB, HML, Extra Market Returns
b. Predictors: (Constant), SMB, HML, Extra Market Returns, Diversification Proxy, Labor Proxy

Table 5.3: Restaurant Sample ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	153393.747	3	51131.249	12.350	.000[a]
	Residual	1697407.410	410	4140.018		
	Total	1850801.157	413			
2	Regression	213563.492	5	42712.698	10.644	.000[b]
	Residual	1637237.665	408	4012.837		
	Total	1850801.157	413			

a. Predictors: (Constant), SMB, HML, Extra Market Returns
b. Predictors: (Constant), SMB, HML, Extra Market Returns, Diversification Proxy, Labor Proxy
c. Dependent Variable: Extra Returns

Adding the labor and diversification proxies yielded a better picture. The modified Fama-French equation is still significant at the p=0.000 level but it now explains 11.5 percent of the variance of the extra returns.

Table 5.4: Restaurant Sample Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.484	3.950		1.388	.166
	Extra Market Returns	.619	.185	.162	3.349	.001
	HML	.442	.149	.144	2.973	.003
	SMB	.563	.172	.159	3.266	.001
2	(Constant)	20.732	7.487		2.769	.006
	Extra Market Returns	.680	.183	.177	3.721	.000
	HML	.345	.149	.113	2.314	.021
	SMB	.496	.171	.141	2.911	.004
	Diversification Proxy	-4.901	3.084	-.074	-1.589	.113
	Labor Proxy	-1.502	.413	-.175	-3.638	.000

a. Dependent Variable: Extra Returns

The labor proxy is very significant at the p=0.000 level and it is negatively related with the expected returns. The negative relationship could be explained by nature of the hospitality industry; a larger workforce is necessary to support the business during the day to day operation and high demand but it becomes quite expensive during the times of low demand. Further, during the times of high demand there are physical limits to the amount of work employees can do and human resource assets do not scale in a similar fashion as other assets such as manufacturing equipment. The diversification proxy is not significant (p= 0.113) but its negative relationship with the extra returns is expected. While diversifying the firm is lowering the risk by investing in multiple segments and by doing so the firm is giving up some of the extra returns that would have received had it invested more in the most profitable segment. It is important to note that the diversification index obtained from the D&B database reflects the status of the company in 2009. The D&B database does not have the same information on a yearly basis. Another issue with measuring diversification through the SIC codes is that having a license to operate in an industry does not measure the actual scale of the company's operations in that particular industry. When a

firm starts operations in a different SIC it can take some time, months to years depending on the circumstances, for the operations to grow. A correlation test was run for the hotel sample as the next step.

Table 5.5: Hotel Sample Correlation Matrix

		Extra Returns	Extra Market Returns	HML	SMB	Diversification Proxy	Labor Proxy
Extra Returns	Pearson Correlation	1	.298**	.095	-.060	-.133	-.132
	Sig. (2-tailed)		.003	.357	.559	.242	.200
	N	96	96	96	96	79	96
Extra Market Returns	Pearson Correlation	.298**	1	.298**	-.504**	.045	-.049
	Sig. (2-tailed)	.003		.003	.000	.696	.636
	N	96	96	96	96	79	96
HML	Pearson Correlation	.095	.298**	1	-.492**	-.014	-.084
	Sig. (2-tailed)	.357	.003		.000	.906	.414
	N	96	96	96	96	79	96
SMB	Pearson Correlation	-.060	-.504**	-.492**	1	-.048	.009
	Sig. (2-tailed)	.559	.000	.000		.675	.930
	N	96	96	96	96	79	96
Diversification Proxy	Pearson Correlation	-.133	.045	-.014	-.048	1	-.341**
	Sig. (2-tailed)	.242	.696	.906	.675		.002
	N	79	79	79	79	79	79
Labor Proxy	Pearson Correlation	-.132	-.049	-.084	.009	-.341**	1
	Sig. (2-tailed)	.200	.636	.414	.930	.002	
	N	96	96	96	96	79	96

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation between the extra returns, SMB and HML is not as significant in the hotel sample. Only the extra return of the market variable is significant at the p=0.003 level, the other variables are not statistically significant. The original Fama-French equation is significant at the p=0.005 level. After adding the labor and diversification proxies the significance of the equations increases to p=0.001 level and the explanation power increases from 15.5 percent to 24.6 percent.

Table 5.6: Hotel Sample Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.393[a]	.155	.121	123.6060361
2	.496[b]	.246	.194	118.3532225

a. Predictors: (Constant), SMB, HML, Extra Market Returns

b. Predictors: (Constant), SMB, HML, Extra Market Returns, Diversification Proxy, Labor Proxy

Table 5.7: Hotel Sample ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	209753.423	3	69917.808	4.576	.005[a]
	Residual	1145883.911	75	15278.452		
	Total	1355637.334	78			
2	Regression	333090.909	5	66618.182	4.756	.001[b]
	Residual	1022546.425	73	14007.485		
	Total	1355637.334	78			

a. Predictors: (Constant), SMB, HML, Extra Market Returns

b. Predictors: (Constant), SMB, HML, Extra Market Returns, Diversification Proxy, Labor Proxy

c. Dependent Variable: Extra Returns

Table 5.8: Hotel Sample Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.961	17.053		.760	.450
	Extra Market Returns	1.589	.452	.424	3.515	.001
	HML	.008	.562	.002	.014	.989
	SMB	.280	.469	.079	.597	.552
2	(Constant)	117.882	42.504		2.773	.007
	Extra Market Returns	1.668	.434	.445	3.845	.000
	HML	-.283	.548	-.062	-.517	.607
	SMB	.009	.459	.002	.019	.985
	Diversification Proxy	-40.348	17.507	-.252	-2.305	.024
	Labor Proxy	-19.019	7.368	-.289	-2.581	.012

a. Dependent Variable: Extra Returns

Because of the small sample and the modifications that were done to the original Fama-French computation steps of the SMB and HML variables, the new SMB and HML variables are not significant. In the years 2000 and 2001, there were no firms in the SL portfolio and in 2008 there were no firms in the BH portfolio. Because of the modifications, the HML and SMB variables carried some bias from the size and ME/BE factor. The hospitality industry specific proxies nevertheless are significant at the p=0.024 level (Diversification Index) and p=0.012 level (Labor Proxy). They add considerably to the explanatory power of the original equation since now the equation explains 24.6 percent of the extra returns at a p=0.001 significance level.

Return on Assets (ROA) Proxy

The Return on Asset proxy was analyzed on both samples and it does not aid on the explanation of returns. Including the ROA proxy actually decreases the explanatory power of the equation on both samples if the value of the adjusted R Square is considered.

Table 5.9: Restaurant Sample ROA Proxy Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.296[a]	.088	.082	6.570800689614582E1
2	.296[b]	.088	.080	6.577235325894277E1

a. Predictors: (Constant), SMB, HML, Extra Market Returns

b. Predictors: (Constant), SMB, HML, Extra Market Returns, ROA

Table 5.10: Restaurant Sample ROA Proxy - ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	202490.645	3	67496.882	15.641	.000[a]
	Residual	2105892.450	488	4315.353		
	Total	2308383.096	491			
2	Regression	202671.490	4	50667.872	11.718	.000[b]
	Residual	2105711.606	487	4323.843		
	Total	2308383.096	491			

a. Predictors: (Constant), SMB, HML, Extra Market Returns

b. Predictors: (Constant), SMB, HML, Extra Market Returns, ROA

c. Dependent Variable: Extra Returns

Table 5.11: Restaurant Sample ROA Proxy -Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.635	3.712		1.249	.212
	Extra Market Returns	.680	.173	.173	3.938	.000
	HML	.462	.140	.146	3.300	.001
	SMB	.586	.161	.161	3.634	.000
2	(Constant)	4.619	3.717		1.243	.215
	Extra Market Returns	.679	.173	.173	3.927	.000
	HML	.462	.140	.146	3.293	.001
	SMB	.584	.162	.161	3.605	.000
	ROA	3.275	16.016	.009	.205	.838

a. Dependent Variable: Extra Returns

It is obvious that the ROA proxy does not add to the explanation of the extra returns. The results from the hotel sample confirm the findings from the restaurant sample.

Table 5.12: Hotel Sample ROA Proxy Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.320[a]	.102	.073	130.0835279
2	.320[b]	.102	.063	130.7869217

a. Predictors: (Constant), SMB, HML, Extra Market Returns

b. Predictors: (Constant), SMB, HML, Extra Market Returns, ROA

Table 5.13: Hotel Sample ROA Proxy -ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	176342.914	3	58780.971	3.471	.019[a]
	Residual	1557841.375	92	16933.058		
	Total	1734184.289	95			
2	Regression	176523.092	4	44130.773	2.578	.043[b]
	Residual	1557661.197	91	17117.156		
	Total	1734184.289	95			

a. Predictors: (Constant), SMB, HML, Extra Market Returns

b. Predictors: (Constant), SMB, HML, Extra Market Returns, ROA

c. Dependent Variable: Extra Returns

Table 5.14: Hotel Sample ROA Proxy - Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.693	15.141		.838	.404
	Extra Market Returns	.906	.438	.238	2.069	.041
	HML	-.553	.717	-.113	-.771	.443
	SMB	.729	.630	.187	1.158	.250
2	(Constant)	12.900	15.356		.840	.403
	Extra Market Returns	.910	.442	.239	2.059	.042
	HML	-.543	.727	-.111	-.747	.457
	SMB	.721	.638	.185	1.130	.262
	ROA	10.732	104.605	.010	.103	.919

a. Dependent Variable: Extra Market Returns

The ROA is a significant factor in the prediction of beta thus it should be correlated with the riskiness of the company based on the CAPM theory. The fact that it does not add to

the explanation of extra returns might be considered another highlight the poor relationship beta has in the prediction of extra returns.

H1 – Labor proxy

Based on the results above from both samples the null hypothesis is rejected. The labor proxy does add to the explanatory power of the Fama & French equation for the hospitality industry. It is highly significant based the tests from both samples studied. Furthermore, the calculation of the labor proxy is much easier than the calculation of SMB and HML so it can be a useful resource for the prospective investor and/or the management.

H2 – Diversification proxy

The diversification proxy was highly significant in the hotel sample ($p= 0.024$) but not as significant in the restaurant sample ($p= 0.113$). Based on the regression tests and the correlation matrixes the null hypothesis is accepted. This decision was also based on the sample sizes (the restaurant sample is much larger) although accepting the null hypothesis can be considered a somewhat conservative approach. The diversification proxy shows promise in the hotel industry and it is interesting to see if it will have the same significance level with a larger sample.

H 3 – ROA proxy

From both samples it is clear that the ROA proxy does not add to the explanatory power of the Fama & French equation for the hospitality industry. The results could be replicated on both samples therefore the null hypothesis is accepted. The ROA can be considered a bottom up approach where the day to day operations of the company have a direct effect on the net income of the company and therefore they could affect the stock price of the company. In both samples this is clearly not the case, other variables are far more significant. It can be assumed that investors use other figures to evaluate the company's risk and its stock price.

CHAPTER 6

DISCUSSION

This paper analyzed the hospitality industry and built on the Fama and French SMB equation (1993). Overall results support the suggestion that industry specific variables can add explanatory power to the Fama and French equation. By using industry specific variables investors can better estimate extra returns. The labor proxy was very significant for both sample studied (restaurants and hotels) and the diversification proxy was highly significant for the hotel sample. The return on asset (ROA) proxy was not significant for both samples.

The labor proxy significance can have important implications for both management and investors. From the results it is clear that the number of employees has a negative effect on the extra returns. The effect of the recent status of the economy is not the only factor for this negative relationship considering that this paper analyzes data spanning ten years. Based on the results, hospitality firms can achieve higher extra returns by minimizing their ratio of labor expenses to the market value.

Limitations of this study included the sample size for the hotel sample and the availability of data for each SIC code for the diversification proxy. As mentioned before, the small size of the hotel sample resulted in significant issues in the calculation of SMB and HML. Further, because of the sample size it is not possible to generalize to the whole industry and/or other markets.

The significance of the diversification proxy was lower than expected in the restaurant sample. A better way to measure diversification could have been to use the following formula because it does capture the true diversification of the company.

$$P2 = \frac{1}{\sum_{i=1}^{N} r_i^2}$$

Where:
P2 = Diversification index
r_i = sales in the line of business i as a percentage of the total sales of the company.

Companies with only once source of income would have a diversification index d = 1 and companies more diversified would have a higher diversification index. It was not possible to use this formula because the detailed revenue data was not available for each SIC code and firms are not required to provide such detailed information to the stockholders.

Other proxies

This paper did not include any data about the interaction between the investors in the trading market. The research from Kocher & Sutter (2005) shows that decision making between the individuals and groups differ. It is interesting to see in future research whether the number of shares, number of shareholders and number of shares traded would proxy for any of this information. Further, from Barrows and Naka (1994) we know that inflation, money supply and domestic consumption are able to explain the movement of restaurant stock returns. These variables can be included in a more thorough Fama and French equation, together with the findings of L'Her et al. (2004) about the significance of BE/ME in up-markets and down-markets.

Other markets

This study analyzes only the active companies in the US market. It would be interesting to include stock exchanges from Europe and possibly Asia to get a larger sample and to

see how significant is the original Fama & French equation is in those markets and how much explanatory power the labor and diversification proxies add.

APPENDIX A

LIST OF SIC CODES IN THE MANUFACTURING INDUSTRY USED TO CALCULATE THE LABOR PROXY

- 2000 Food and Kindred Products
- 2100 Tobacco Manufacturing
- 2200 Textile Mill Products
- 2300 Apparel and Other Textile Products
- 2400 Lumber and Wood Products
- 2500 Furniture and Fixtures
- 2600 Paper and Allied Products
- 2700 Printing and Publishing
- 2800 Chemicals and Allied Products
- 2900 Petroleum and Coal Products
- 3000 Rubber/Misc. Plastic Products
- 3100 Leather and Leather Products
- 3200 Stone, Clay, Glass and Concrete Products
- 3300 Primary Metal Industries
- 3400 Fabricated Metal Products
- 3500 Industrial and Commercial Machinery and Computer Equip
- 3600 Electrical Equipment and Components
- 3700 Transportation Equipment
- 3800 Measurement Analyzing, Control Instr and Related Prod.
- 3900 Misc. Manufacturing Industries

APPENDIX B

DIVERSIFICATION MATRIX

SIC Code	Company Name	Ticker Symbol	Line of Business	SIC Codes	Diversification Index
5812	ARK RESTAURANTS CORP	ARKR	Eating place; wholesale or wholesale & retail combined bakery; bar & lounge drinking establishment	58120000 - Eating places (Primary) 58130100 - Bars and lounges 20519903 - Bakery: wholesale or wholesale/retail combined	3
5812	EINSTEIN NOAH RESTAURANT GRP	BAGL	Delicatessen; manufactures frozen or refrigerated doughs from purchased flour; selling or licensing of franchises	58120305 - Delicatessen (eating places) (Primary) 20450202 - Doughs, frozen or refrigerated: from purchased flour 67949902 - Franchises, selling or licensing	3
5812	FLANIGANS ENTERPRISES INC	BDL	Owns And Operates Restaurants	58120000 - Eating places (Primary) 59210000 - Liquor stores 58130200 - Night clubs	3
5812	BJ'S RESTAURANTS INC	BJRI	Restaurant Chain	58120600 - Pizza restaurants (Primary)	1
5812	BURGER KING HOLDINGS INC	BKC	Operates & Franchises Fast Food Restaurants	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
5812	BENIHANA INC -CL A	BNHNA	Japanese Restaurant Operator	58120109 - Japanese restaurant (Primary)	1

5812	BOB EVANS FARMS	BOBE	Full service chain family restaurant; manufactures sausages from slaughtered meat; manufactures perfumes, flavorings & food additives; manufactures salads	58120501 - Restaurant, family: chain (Primary) 20119907 - Sausages, from meat slaughtered on site 20990705 - Salads, fresh or refrigerated 28690500 - Perfumes, flavorings, and food additives	4
5812	SCHLOTZSKY'S INC	BUNZQ	Sandwich Shops	58120313 - Sandwiches and submarines shop (Primary)	1
5812	CHEESECAKE FACTORY INC	CAKE	Ret Food	58130000 - Drinking places (Primary) 20510202 - Cakes, bakery: except frozen	2
5812	MEXICAN RESTAURANTS INC	CASA	Operates Mexican Restaurants Franchise Agreements And Resturant Accessories	58120112 - Mexican restaurant (Primary) 67949902 - Franchises, selling or licensing 50460306 - Restaurant equipment and supplies, nec	3
5812	CARIBOU COFFEE CO	CBOU	Coffee Shops Ret Whole Beans Food Items & Related Merchandise	58120304 - Coffee shop (Primary) 54990201 - Coffee 57190100 - Kitchenware	3
5812	CRACKER BARREL OLD CTRY STOR	CBRL	Restaurant Operator Ret Gifts/Novelties	58120501 - Restaurant, family: chain (Primary) 59470104 - Gift shop	2

5812	CEC ENTERTAINMENT INC	CEC	Family Restaurant & Entertainment Center	58120601 - Pizzeria, chain (Primary) 67949902 - Franchises, selling or licensing 79930000 - Coin-operated amusement devices	3
5812	O'CHARLEY'S INC	CHUX	Restaurant Chain	58120501 - Restaurant, family: chain (Primary)	1
5812	CHIPOTLE MEXICAN GRILL INC	CMG	Mexican Restaurant Chain	58120310 - Grills (eating places) (Primary) 58130000 - Drinking places	2
5812	COSI INC	COSI	Owns Operates And Franchises Premium Convenience Restaurants	58120000 - Eating places (Primary) 67949902 - Franchises, selling or licensing	2
5812	CALIFORNIA PIZZA KITCHEN INC	CPKI	Casual Dining & Pizza Restaurants & Franchises	58120600 - Pizza restaurants (Primary) 67949902 - Franchises, selling or licensing	2
5812	FAMOUS DAVES OF AMERICA INC	DAVE	Restaurants And Franchising	58120500 - Family restaurants (Primary) 67949902 - Franchises, selling or licensing	2
5812	DINEEQUITY INC	DIN	Develops Franchises & Operates A National Family Restaurant Chains	58120501 - Restaurant, family: chain (Primary) 67949902 - Franchises, selling or licensing	2

5812	DOMINO'S PIZZA INC	DPZ	Pizza Dough Manufacturing Distribution And Franchising	51499906 - Pizza supplies (Primary) 67949902 - Franchises, selling or licensing 58120601 - Pizzeria, chain	3
5812	DARDEN RESTAURANTS INC	DRI	Seafood Restaurants	58120700 - Seafood restaurants (Primary)	1
5812	BRINKER INTL INC	EAT	American Italian And Mexican Restaurants Franchisors Of Restaurants	58120000 - Eating places (Primary) 67949902 - Franchises, selling or licensing	2
5812	ELXSI CORP	ELXS	Eating Place Mfg Service Industry Machinery	58120501 - Restaurant, family: chain (Primary) 35890302 - Sewer cleaning equipment, power	2
5812	FOG CUTTER CAPITAL GROUP INC	FCCG	Fast Food Restaurant Software Development & Real Estate Investment	58120307 - Fast-food restaurant, chain (Primary) 73710301 - Computer software development 67999905 - Real estate investors, except property operators	3
5812	FRISCH'S RESTAURANTS INC	FRS	Restaurant-Fam Chain	58120501 - Restaurant, family: chain (Primary)	1
7011	GAYLORD ENTERTAINMENT CO	GET	Hotels Entertainment & Broadcasting	70110000 - Hotels and motels (Primary) 48320104 - Country 73890000 - Business services, nec	3

5812	GRILL CONCEPTS INC	GLLC	Development Ownership Operation Management And Licensing Of Dining Restaurants	58120502 - Restaurant, family: independent (Primary)	1
5812	GOOD TIMES RESTAURANTS INC	GTIM	Eating Place	58120306 - Drive-in restaurant (Primary)	1
7011	ARLINGTON HOSPITALITY INC	HOST			
7011	STARWOOD HOTELS&RESORTS WRLD	HOT	Hotel & Leisure Operations And Management	70110000 - Hotels and motels (Primary) 87419904 - Hotel or motel management	2
5812	ICH CORP	ICHP			
7011	INTERCONTINENTAL HOTELS GRP	IHG	Hotels And Motels	70110000 - Hotels and motels (Primary)	1
5812	JACK IN THE BOX INC	JACK	Operator Fast Food Chain Restaurants	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
5812	J. ALEXANDER'S CORP	JAX	Operates Full-Service Casual Dining Restaurants	58120307 - Fast-food restaurant, chain (Primary)	1
5812	KONA GRILL INC	KONA	Owns And Operates Upscale Casual Dining Restaurants	58120000 - Eating places (Primary)	1
5812	KRYSTAL CO	KRYS	Eating Place Patent Owner/Lessor	58120101 - American restaurant (Primary) 67949902 - Franchises, selling or licensing	2

7011	LODGIAN INC	LGN	Hotel/Motel Operation Drinking Place	70110000 - Hotels and motels (Primary) 58130000 - Drinking places	2
5812	LANDRYS RESTAURANTS INC	LNY	Seafood Restaurants And Casino Hotel	58120700 - Seafood restaurants (Primary) 70110300 - Hotels	2
5812	LUBYS INC	LUB	Restaurants	58120500 - Family restaurants (Primary)	1
7011	MARRIOTT INTL INC	MAR	Hotel/Motel Operation Patent Owner/Lessor Real Estate Agent/Manager	70110000 - Hotels and motels (Primary) 67949902 - Franchises, selling or licensing 65310402 - Time-sharing real estate sales, leasing and rentals	3
5812	MCDONALD'S CORP	MCD	Operates & Franchises Restaurants	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
7011	MORGANS HOTEL GROUP CO	MHGC	Hotel Operations	70110000 - Hotels and motels (Primary)	1
5812	MERITAGE HOSPITALITY GROUP	MHGU	Eating Place Patent Owner/Lessor	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
7011	MAUI LAND & PINEAPPLE CO	MLP	Production And Sale Of Pineapple Products Resort Operations & Real Estate Development & Sales	01799908 - Pineapple farm (Primary) 65310000 - Real estate agents and managers 70110303 - Resort hotel	3

5812	MORGANS FOODS INC	MRFD	Fast Food Restaurants	58120307 - Fast-food restaurant, chain (Primary)	1
5812	MORTONS RESTAURANT GROUP INC	MRT	Restaurant Operating Company	58120802 - Steak restaurant (Primary)	1
5812	MCCORMICK & SCHMICKS SEAFOOD	MSSR	Seafood Restaurants	58120700 - Seafood restaurants (Primary)	1
5812	NATHAN'S FAMOUS INC	NATH	Restaurants And Franchisor	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
5812	NUTRITION MGMT SVCS -CL A	NMSCA	Provider Of Food Facilities Operations Housekeeping Management Services Through Management & Supervision	58129906 - Contract food services (Primary) 73490103 - Hospital housekeeping 87440000 - Facilities support services	3
7011	ORIENT-EXPRESS HOTELS	OEH	Eating Place Hotel/Motel Operation	58120000 - Eating places (Primary) 70110300 - Hotels	2
5812	ORGANIC TO GO FOOD CORP	OTGO	Retail Eating Places	58120000 - Eating places (Primary)	1
5812	P F CHANGS CHINA BISTRO INC	PFCB	Chinese Restaurants	58120103 - Chinese restaurant (Primary)	1
5812	PLANET HOLLYWOOD INTL INC	PHWDQ	Theme Restaurant	58120501 - Restaurant, family: chain (Primary)	1
5812	PICCADILLY CAFETERIAS INC	PICZQ	Eating Place	58120402 - Cafeteria (Primary)	1

5812	PANERA BREAD CO	PNRA	58129902 - Cafe (Primary) 54610000 - Retail bakeries 67949902 - Franchises, selling or licensing	58129902 - Cafe (Primary) 54610000 - Retail bakeries 67949902 - Franchises, selling or licensing	3
5812	PAPA JOHNS INTERNATIONAL INC	PZZA	Limited service chain pizzeria restaurant; selling or licensing of franchises; manufactures food preparations	58120601 - Pizzeria, chain (Primary) 67949902 - Franchises, selling or licensing 20990000 - Food preparations, nec	3
7011	RED LION HOTELS CORP	RLH	Hotel/Motel Operation	70110300 - Hotels (Primary)	1
5812	RED ROBIN GOURMET BURGERS	RRGB	Restaurants And Franchises	58120501 - Restaurant, family: chain (Primary) 67949902 - Franchises, selling or licensing	2
5812	RUBY TUESDAY INC	RT	Owns And Franchises Restaurants	58120501 - Restaurant, family: chain (Primary) 67949902 - Franchises, selling or licensing 58130101 - Bar (drinking places)	3
5812	RUBIO'S RESTAURANTS INC	RUBO	Mexican Restaurant	58120112 - Mexican restaurant (Primary)	1
5812	STARBUCKS CORP	SBUX	Specialty Coffee Shop Chain	58120304 - Coffee shop (Primary) 54619906 - Pastries 51490901 - Coffee, green or roasted 59610100 - Food, mail order 54990201 - Coffee 57190100 - Kitchenware	6

5812	SODEXO	SDXAY	Hotel/Motel Operation Eating Place	70110000 - Hotels and motels (Primary) 58120000 - Eating places	2
5812	STEAK N SHAKE CO	SNS	Family Chain Restaurants Franchisor	58120501 - Restaurant, family: chain (Primary) 67949902 - Franchises, selling or licensing	2
7011	SONESTA INTL HOTELS -CL A	SNSTA	Operates Hotels	70110300 - Hotels (Primary)	1
5812	SONIC CORP	SONC	Drive-In Restaurants Franchisor Of Restaurants	67949902 - Franchises, selling or licensing (Primary) 58120306 - Drive-in restaurant	2
5812	STEAKHOUSE PARTNERS INC	STKPQ	Operates As A Chain Family Restaurant	58120501 - Restaurant, family: chain (Primary)	1
5812	STAR BUFFET INC	STRZ	Buffet Restaurants	58129901 - Buffet (eating places) (Primary)	1
5812	CARROLS RESTAURANT GROUP INC	TAST	Fast-Food Restaurant Chain	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
5812	TEXAS ROADHOUSE INC	TXRH	Restaurant	58120802 - Steak restaurant (Primary)	1
5812	WENDY'S/ARBY'S GROUP INC	WEN	Eating Place/Franchisor	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2
5812	WESTERN SIZZLIN CORP	WEST	Franchise And Operate Restaurants	58120000 - Eating places (Primary)	1

7011	GREAT WOLF RESORTS INC	WOLF	Family Entertainment Resort	70110000 - Hotels and motels (Primary)	1
5812	YUM BRANDS INC	YUM	Operator/Franchiser Quick Service Restaurant Chains	58120307 - Fast-food restaurant, chain (Primary) 67949902 - Franchises, selling or licensing	2

APPENDIX C

VARIABLES OBTAINED FROM COMPUSTAT

Variable	Mnemonic	Category	Periodicity	Format	Units	Description
Stock Exchange	EXCHG	Identifying Information		Number		This item identifies the major exchange on which the company's Common/Ordinary Stock (Capital) is traded. Below are some of the common exchange codes. A complete list is available in the Compustat manual. Used Code Descriptions: 1 Non-traded Company or Security 11 New York Stock Exchange 12 American Stock Exchange 13 OTC Bulletin Board 14 NASDAQ-NMS Stock Market 19 Other-OT
Assets - Total	AT	Balance Sheet	Annual	Number	Millions	This item represents the total value of assets reported on the Balance Sheet.
Net Income (Loss)	NI	Income Statement	Annual	Number	Millions	This item represents the income or loss reported by a company after expenses and losses have been subtracted from all revenues and gains for the fiscal period including extraordinary items and discontinued operations.
Revenue - Total	REVT	Income Statement	Annual	Number	Millions	This item represents the gross income received from all divisions of the company.
Staff Expense - Total	XLR	Income Statement	Annual	Number	Millions	This item represents salaries, wages, pension costs, profit sharing and incentive compensation, payroll taxes and other employee benefits. This item excludes commissions.

Employees	EMP	Miscellaneous Items	Annual	Number	Thousands	This item represents the number of company workers as reported to shareholders. This is reported by some firms as an average number of employees and by some as the number of employees at year-end. No attempt has been made to differentiate between these bases of reporting. If both are given, the year-end figure is used.

Dividends per Share - Ex- Date - Fiscal	DVPSX_F	Supplemental Data Items	Annual	Number	Dollars and Cents	This item represents the cash dividends per share for which the ex-dividend dates occurred during the reporting period, adjusted for all stock splits and stock dividends that occurred during the period. This item, unlike Common Dividends, excludes payments in preferred stock in lieu of cash, spin-offs and stock of other corporations. The ex-dividend date of the cash dividend is, in all cases, used to determine the reporting period in which the dividend is included. In cases where dividends are normally paid quarterly, but the ex-dividend dates of two dividend payments fall in the same quarter, both dividends will be included in that quarter.Any extra dividend whose ex-dividend date occurred during the period will be included in this item. Common Dividends is the sum of all classes outstanding when there is more than one class of Common/Ordinary Stock (Capital) outstanding, but dividends per share is the major class outstanding. The dividends are adjusted by the Adjustment Factor ? Cumulative by Ex-Date that appears for that year or quarter.This data item is updated the week after the fiscal year-end.The dividends per share for companies having more than one class of Common/Ordinary Stock (Capital) outstanding will be based on the stock class that is most widely traded (based on volume of shares traded)..Dividends will always be zero until a company goes public.This item is gross of tax.

Market Value - Total - Fiscal	MKVALT	Supplemental Data Items	Annual	Number	Millions	Consolidated company-level market value is the sum of all issue-level market values, including trading and non-trading issues. Market value for single issue companies is common shares outstanding multiplied by the month-end price that corresponds to the period end date.
Price High - Annual - Fiscal	PRCH_F	Supplemental Data Items	Annual	Number	Actual Currency	This item contains the absolute high market prices for each fiscal year. Bid prices are reported for over-the-counter issues which are not traded on NASDAQ National Market System. (Generally, only the close price is available for over-the-counter companies prior to 1971.)
Price Low - Annual - Fiscal	PRCL_F	Supplemental Data Items	Annual	Number	Actual Currency	This item contains the absolute low market prices for each fiscal year. Bid prices are reported for over-the-counter issues which are not traded on NASDAQ National Market System. (Generally, only the close price is available for over-the-counter companies prior to 1971.)
Price Close - Annual - Fiscal	PRCC_F	Supplemental Data Items	Annual	Number	Actual Currency	This item represents the absolute close transactions during the fiscal year for companies on national stock exchanges and bid prices for over-the-counter issues. If a company suspends trading, the close price of the stock will be presented as of the last trading day.
Investment Tax Credit (Balance Sheet)	ITCB	Balance Sheet	Annual	Number	Millions	This item represents accumulated tax deferrals of investment tax credits generated by new capital investments. This item is a component of Deferred Taxes and Investment Tax Credit (TXDITC).

Preferred/Preference Stock (Capital) - Total	PSTK	Balance Sheet	Annual	Number	Millions	This item represents the net number of preferred shares at year-end multiplied by the par or stated value per share as presented in the company's Balance Sheet. This item is a component of Shareholders' Equity (SEQ).
Preferred Stock - Convertible	PSTKC	Balance Sheet	Annual	Number	Millions	This item represents the carrying value of outstanding preferred stock which is reported as being convertible into Common/Ordinary Stock (Capital) of a company.
Preferred Stock - Liquidating Value	PSTKL	Balance Sheet Supplemental	Annual	Number	Millions	This item represents the total dollar value of the net number of preferred shares outstanding in the event of involuntary liquidation (such as, bankruptcy) multiplied by the per share involuntary liquidating value.
Preferred/Preference Stock - Nonredeemable	PSTKN	Balance Sheet	Annual	Number	Millions	This item represents the number of the company's nonredeemable preferred shares issued at yearend multiplied by the par or stated value per share.
Preferred/Preference Stock - Redeemable	PSTKRV	Balance Sheet Supplemental	Annual	Number	Millions	This item represents any stock which the issuer undertakes to redeem at a fixed or determinable price on a fixed or determinable date or dates by operation of a sinking fund or other methods.
Preferred Stock - Redemption Value	PSTKRV	Balance Sheet Supplemental	Annual	Number	Millions	This item represents the total dollar value of the net number of preferred shares outstanding multiplied by the voluntary liquidation or redemption value per share?whichever is greater. Standard & Poor's uses the involuntary liquidation or redemption value when the voluntary liquidation or redemption value is not reported. When an involuntary liquidation figure is not reported, Standard & Poor's uses the carrying value.

Stockholders Equity - Total	SEQ	Balance Sheet	Annual	Number	Millions	This item represents the common and preferred shareholders' interest in the company.
Deferred Taxes (Balance Sheet)	TXDB	Balance Sheet	Annual	Number	Millions	This item is a component of Deferred Taxes and Investment Tax Credit (TXDITC). This item represents the accumulated tax deferrals due to timing differences between the reporting of revenues and expenses for financial reporting and tax purposes. This item includes deferred investment tax credits, when combined with deferred taxes and a separate figure is not available.

APPENDIX D

SUMMARY OF CALCULATED VARIABLES

Variable	Formula	Description
Book Equity	Stockholders' equity, + deferred taxes and investment credit - preferred stock	Value of stockholders' equity, plus balance-sheet deferred taxes and investment credit, minus the book value of preferred stock. Preferred stock was calculated depending on availability of redemption, liquidation or par values.
Extra Returns	r=(p1-p0+d0)/p0	Where: r = returns for the fiscal year 1 p0 = Price Close Annual Fiscal on year 0 p1 = Price Close Annual Fiscal on year 1 d0 = Dividend paid on year 0 On the first year where p-1 is not available, the average of price fiscal high and price fiscal low was used.
Extra Market Returns	∑(rM)/∑M	Where: r = returns of the firm for the fiscal year M = Market value of the firm on that year
SMB (Restaurants)	Average (SL, SM and SH) - Average (BL, BM and BH)	SMB was calculated as the difference between the simple average of the three small-stock portfolios (SL, SM and SH) and the three big-stock portfolios (BL, BM and BH). This variable proxies for effect that size (market value) has on the returns and should be free of the bias that could be introduced by the BE/ME ratio.
HML (Restaurants)	Average (SH and BH) - Average (SL and BL)	HML was calculated as the difference between the simple average of the returns of the SH and BH portfolios and the SL and BL portfolios. This variable should be free of the size effect; by using both small and big firms we can remove the size effect and capture the book to market ratio effect on the returns.

SMB (Hotels)	Average (SL and SH) - Average (BL and BH)	SMB was calculated as the difference between the simple average of the two small-stock portfolios (SL and SH) and the two big-stock portfolios (BL and BH). This variable proxies for effect that size (market value) has on the returns and should be free of the bias that could be introduced by the BE/ME ratio.
HML (Hotels)	Average (SH and BH) - Average (SL and BL)	HML was calculated as the difference between the simple average of the returns of the SH and BH portfolios and the SL and BL portfolios. This variable should be free of the size effect; by using both small and big firms we can remove the size effect and capture the book to market ratio effect on the returns.

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