

Journal of Hospitality Financial Management

The Professional Refereed Journal of the International Association of Hospitality Financial Management Educators

Volume 17
Issue 1 *Issue 1*

Article 6

2009

The Predictive Ability of the Historic Beta of Hotel Stocks in the 2008 Market Downturn

Barry Bloom

Follow this and additional works at: <https://scholarworks.umass.edu/jhfm>

Recommended Citation

Bloom, Barry (2009) "The Predictive Ability of the Historic Beta of Hotel Stocks in the 2008 Market Downturn," *Journal of Hospitality Financial Management*. Vol. 17 : Iss. 1 , Article 6.
Available at: <https://scholarworks.umass.edu/jhfm/vol17/iss1/6>

This Refereed Article is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Journal of Hospitality Financial Management by an authorized editor of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

THE PREDICTIVE ABILITY OF THE HISTORIC BETA OF HOTEL STOCKS IN THE 2008 MARKET DOWNTURN

Barry A. N. Bloom

Abstract

This study investigates the performance of hotel common stocks relative to specific market indices and assesses whether or not historic beta was an appropriate measurement of future risk for hotel stocks in the market downturn of 2008. Using three different measurements of beta, the study finds statistically significant differences in beta between typical and up-market scenarios as compared with a down-market scenario. This difference was persistent regardless of the beta measure used. The study also identifies a statistically significant difference in betas between hotel real estate investment trusts and hotel C corporations in the down-market scenario. This study identifies the significant risk taken on by investors in assuming that betas for hotel stocks will be persistent across varying market scenarios.

Introduction

The year of 2008 marked a series of watershed events in the capital markets in the United States. During that period of time, capital markets experienced extreme volatility as the result of a prolonged credit crisis, ultimately resulting in government intervention in an effort to restore market stability and investor confidence. The Standard & Poor's 500 Stock Market Index declined 37.4 percent in 2008, while the Dow Jones Hotel Index declined 54.7 percent.

This paper investigates several factors related to stock market declines in hotel stocks that are of importance to investors, researchers, and practitioners. The purpose of this study is to investigate the performance of hotel stocks relative to specific market indices. This investigation will assess whether or not future performance relative to market indices was in line with the perceived risk associated with those stocks as determined by common market measures from prior periods, most notably beta. Three different calculations of beta for hotel stocks are compared over three independent periods reflecting a typical low-growth market period, a period of significant growth, and a period of significant decline. The differences between real estate investment trusts (REITs) in the hotel sector and non-REITs in the hotel sector are also investigated in an effort to identify company characteristics that either mitigated or heightened both risk and return during these periods.

Literature Review

Definition of Beta

Beta is a measure of the sensitivity of a stock's price relative to changes in a market index and, as such, is a measure of volatility (Levy, 1974). In statistical terms, beta is the slope of the linear regression of a stock's returns (S) on a market index's return (M) and is the covariance of S and M divided by the variance of M (Levy). Companies that have a beta of 1.00 are considered to be the least volatile relative to the specified market index and are considered to have the same amount of risk as the specified market index. Companies with betas in excess of 1.00 are more volatile than the specified market index, while companies with betas below 1.00 are less volatile than the specified market index. Companies that move opposite to the overall stock market can have betas that are negative.

Beta as a Determinant of Risk

The earliest work on determining risk for individual stocks and stock portfolios was conducted by Markowitz (1952), whose work was the first to identify a process for stock portfolio selection that was based on estimates of future stock performance, developing an efficient set of portfolios, and selecting the optimum portfolio for an investor's needs. His work in this area was advanced significantly by Sharpe (1963, 1964) who is credited with the first development of a single-index market model (SIMM) that could be used to determine single-period stock price changes as shown in Equation 1:

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it} \quad (1)$$

where R_{it} equals the excess return on security i for time period t , and R_{mt} equals the excess return on a market index for period t . In this model, beta (β) is considered to represent the systematic risk in a stock and it has been widely applied as a risk measure on both a historic and forecast basis.

The use of beta has been widely debated, most notably by Fama and French (1992), whose development of their three-factor model has spurred significant debate regarding whether or not beta continues to be a relevant measure of systematic risk for individual stocks (Fama & French, 1996; Pettengill, Sundaram, & Mathur, 1995). The Fama-French three-factor model included risk factors related to value and size as explanatory variables for the returns of publicly traded stocks (Fama & French, 1992). These risks are represented using factors known as SMB (Small Minus Big), which measures the additional return investors have historically received by investing in small company stocks, and HML (High Minus Low), which measures the additional return investors have historically received by investing in stocks with high book-to-market values (Womack & Zhang, 2003). The equation is expressed as:

$$R_{it} = \alpha_i + \beta_i R_{mt} + S_i \text{SMB} + H_i \text{HML} + e_{it} \quad (2)$$

where S_iSMB represents the level of exposure to size risk and H_iHML represents the level of exposure to value risk.

Although the capital asset pricing model (CAPM) beta is still considered to be an appropriate measure by many academics and practitioners (Black, 1993; Madanoglu & Olsen, 2005), the Fama-French model is generally considered to be the more relevant measure. Hospitality researchers have also commented on the pros and cons of the CAPM beta as compared to the Fama-French model (Madanoglu & Olsen; Madanoglu, Olsen, & Kwansa, 2005) and have generally concluded that the Fama-French model is more appropriate for general use. This study will utilize both the CAPM and Fama-French three-factor models to estimate beta in an effort to confirm and further the research in this area.

Beta and Market Performance

Several studies have focused on beta as a predictor of performance in rising and declining stock markets. Fabozzi and Francis (1977) studied a sample of 700 New York Stock Exchange stocks and found that the SIMM was not significantly different in bull (up) markets than in bear (down) markets. Their finding was in contrast to the earlier findings of Levy (1974), who found that betas were positively correlated in bull markets and negatively correlated in bear markets. M. K. Kim and Zumwalt (1979) further investigated the hypothesis that securities respond differently in up and down markets and ultimately developed a two-beta model that separated systematic risk into the variation between upside and downside activity. Chen (1982) found significant issues with their model due to multicollinearity issues, but generally confirmed that a down-market beta measuring downside risk is a more appropriate measure of portfolio risk than a single beta measure.

Wiggins (1992) revisited this issue a decade later and found that beta is not necessarily a sufficient measure of conditional market risk when market volatility is relatively high (as in periods such as the depression and the 1970s).

Hotel Stock Risk and Performance

There is a relatively small body of literature relating to hotel stock market activity, much of which has been developed within the last few years. Most of that literature has been primarily focused on the underlying components of risk rather than looking at whether or not historic measures of risk were important factors in predicting future stock performance.

H. Kim, Gu, & Mattila (2002) were the first researchers to look at the risk features and beta determinants of hotel stocks, specifically hotel REITs, finding that 84 percent of the firms' total risk was contributed by firm-specific, unsystematic risk. Gu and Kim (2003) followed up on this article with a closer examination of the determinants of hotel REITs' unsystematic risk, finding that unsystematic risk was positively associated with debt

and dividend payout and negatively associated with capitalization. The same authors also conducted a comparative analysis of Jensen indexes of hotel REITs as compared to other REIT sectors, finding that hotel REITs had the highest market risk and that the performance of the average hotel REIT underperformed office, industrial, residential, and diversified REITs (H. Kim, Mattila, & Gu, 2002). Most of the work by these authors centered on research that had been previously conducted in the general finance field, and then focused it on the hotel industry.

Lee and Upneja (2007) questioned whether or not Wall Street understood the valuation of publicly traded lodging stocks, using an equity valuation model and finding that for much of the 1990s lodging stocks were undervalued relative to non-lodging stocks. Also relevant to this study is Lee and Upneja's (2008) recent work that looks at the CAPM to estimate cost-of-equity for the lodging industry, as well as Lee's (2008) recent work, which analyzes financial risk measures using factor analysis. Lee and Upneja (2008) found that an implied cost of equity (ICE) model, in particular a model based on a price-to-forward earnings model, was a better estimator of cost-of-equity capital. Most recently, Weinbaum (2009) looked at the historical performance of hospitality stocks over a 42-year period, but focused on actual returns achieved by investors rather than the prediction of returns.

There have been a number of related studies of restaurant companies as well, by many of the same researchers who have investigated hotel stocks. H. Kim and Gu (2003) utilized Sharpe Index, Treynor Index, and Jensen Index analysis to compare the performance across restaurant sectors from 1996 to 2000. They found that the stocks of companies in the fast-food segment outperformed companies in the full-service and economy/buffet segments, but that their performance was inferior to the overall stock market. Mao and Gu (2007) furthered this work by examining casino, restaurant, and hotel stocks through a similar analysis from 2000 to 2003 in an effort to capture the risk and return characteristics during an industry downturn, a period not dissimilar to the period being investigated in this paper. None of the existing research in hospitality literature has looked at whether or not historic betas were appropriate predictors of hotel stock performance under varying market conditions.

Hotel REITs and C Corps

Literature and research on the performance of hotel stocks is a nascent field and has been primarily focused on the performance of REITs. A REIT is an investment vehicle that invests primarily in income-producing real estate and is generally publicly owned and traded. In order for a company to qualify as a REIT in the United States, it must comply with specific rules outlined in the Internal Revenue Code. These rules include: investing at least 75 percent of total assets in real estate; deriving at least 75 percent of gross income as rents from real property or interest from mortgages on real property; and distributing annually at least 90 percent of taxable income to shareholders in the form of dividends (National Association of Real Estate Investment Trusts, n.d.).

Although REITs were authorized based on 1960 federal legislation (Zietz, Sirmans, & Friday, 2003), hotel-specific REITs are a relatively new phenomenon—in 1993, there were only two hotel REITs with a total market capitalization of approximately \$100 million (L. A. Jackson, 2007). The existing literature in this area has primarily focused on the identification of the risk features of hotel REITs and the performance of hotel REITs relative to REITs that focus on other property types. These studies have generally found that hotel REITs carry the highest market risk as compared to other REIT sectors; that the predominant risk in hotel REITs is firm-specific, unsystematic risk; and that the hotel REIT sector has generally underperformed office, industrial, residential, and diversified REITs (Gu & Kim, 2003; H. Kim, Gu, et al., 2002; H. Kim, Mattila, et al., 2002).

As it relates to lodging stocks in general, there is a discrete but limited body of existing literature. Lee and Upneja (2007) found that lodging stocks are considered to be undervalued relative to other stocks in the general economy, the service economy, and the real estate economy, but they did not identify the factors that lead to undervaluation of lodging stocks.

While the studies that have been conducted to date do an adequate job of highlighting risk factors on a backward-looking basis, none of them identify whether or not there is a relationship between risk, as measured by various well-known indices, and future stock performance. Further, most of the studies that have been performed have used data that was several years dated by the time of publication. The market downturn of 2008 provides an excellent backdrop for this area of study and the opportunity to apply the concept of beta performance in up and down markets to the hotel industry.

Hypotheses

The literature review identified several interesting studies from which further testing can be derived. Specifically, the literature regarding beta in up and down markets is of particular interest, given the dramatic market events of 2008. For the purpose of this study, the period from January 1, 2005, to December 31, 2005, was selected to represent a typical market with an S&P 500 Composite Index return of 3.5 percent and a CRSP Value Weighted Index return of 7.6 percent. The period from July 1, 2006, to June 30, 2007, was selected to represent an up market with an S&P 500 Composite Index return of 17.4 percent and a CRSP Value Weighted Index return of 19.9 percent. The period from January 1, 2008, to December 31, 2008, was selected to represent a down market with an S&P 500 Composite Index return of -40.1 percent and a CRSP Value Weighted Index return of -40.0 percent.

The effectiveness of beta as an estimator of risk is of interest to academics and practitioners, most notably stock analysts. The following hypotheses are proposed regarding stock market beta for hotel stocks based on the literature review and results identified in previous studies.

H₁: The difference in beta for hotel stocks in an up market as compared to a down market is not statistically significant and this difference is persistent, regardless of market index or beta model used.

H₂: The difference in beta for hotel stocks in a typical market as compared to an up market is statistically significant and this difference is persistent, regardless of market index or beta model used.

H₃: The difference in beta for hotel stocks in a typical market as compared to a down market is not statistically significant and this difference is persistent, regardless of market index or beta model used.

Further, based on the literature review regarding the unique components of REITs and performance differences in various restaurant segments, we propose the following hypotheses regarding beta for hotel (REITs) and C corps.

H₄: The difference in beta for hotel REITs and C corps is statistically significant in an up market.

H₅: The difference in beta for hotel REITs and C corps is statistically significant in a typical market.

H₆: The difference in beta for hotel REITs and C corps is not statistically significant in a down market.

Methodology

Population and Study Design

The sample for this research consisted of all public hotel companies that were traded on the NYSE, AMEX, or NASDAQ stock exchanges for all trading days from 2005 to 2008. Stock market data was accessed through the Wharton Research Data Service (WRDS), which provides access to the Center for Research in Security Prices (CRSP) data published by the University of Chicago.¹ CRSP is the primary database used for academic research on stock price and trading volume.

This study used daily return data adjusted for dividends and splits. The study identifies excess returns for hotel stocks as compared with the Standard & Poor's 500 Composite Index as well as the CRSP Value Weighted Index, as these are the two most commonly used market indices in studies of this type. Stock market data was obtained from the Center for Research in Security Prices (CRSP) database for 21 companies for

¹ ©2008 CRSP®, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved. www.crsp.chicagogsb.edu.

three separate 12-month periods (as specified earlier) intended to represent varying market conditions.

Using Microsoft Excel, CAPM beta was calculated for each stock shown in Table 1 for each period using ordinary least squares regression and the daily returns for the subject stock and the S&P 500 Composite Index in the first case and the CRSP Value Weighted Index in the second case. The Fama-French three-factor analysis beta was calculated using Microsoft Excel using the CRSP Value Weighted Index, the SMB average return on the Fama-French three small portfolios minus the average return on the three big portfolios, and the HML average return on the Fama-French two value portfolios minus the average return on the two growth portfolios. The CRSP Value Weighted Index is the appropriate index for use in the Fama-French three-factor model and the SMB and HML data was obtained from Kenneth R. French's website at Dartmouth College (French, n.d.). The use of beta based on daily stock return is indicated for a short-term analysis, provided at least one year of trading data is obtainable (M. Jackson & Staunton, 2001; Levy, 1974).

Table 1
Hotel companies included in data set for all available trading days
between January 1, 2005, and December 31, 2008

Company Name (Ticker Symbol)	Company Name (Ticker Symbol)
Ashford Hospitality Trust (AHT)	Marcus Corp. (MCS)
Choice Hotels International, Inc.(CHH)	Marriott International, Inc (MAR)
Felcor Lodging Trust, Inc. (FCH)	Orient Express Hotels, Inc. (OEH)
Gaylord Entertainment Co. (GET)	Red Lion Hotels Corp. (RLH)
Great Wolf Resorts, Inc. (WOLF)	Sonesta International Hotels Corp. (SNSTA)
Hersha Hospitality Trust (HT)	Starwood Hotels & Resorts Worldwide, Inc. (HOT)
Hospitality Properties Trust (HPT)	Strategic Hotels & Resorts, Inc. (BEE)
Host Hotels & Resorts, Inc. (HST)	Sunstone Hotel Investors, Inc. (SHO)
Interstate Hotels & Resorts, Inc. (IHR)	Supertel Hospitality, Inc. (SPPR)
Lodgian, Inc. (LDG)	Vail Resorts, Inc. (MTN)
LaSalle Hotel Properties (LHO)	

After betas were calculated, they were input into SPSS and descriptive statistics and paired-samples *t*-tests were performed on the data to determine if the differences in beta between the different time periods and for each methodology were statistically significant. Further analysis was then conducted using independent *t*-tests to determine whether there was a statistically significant difference in the betas between hotel REITs and C corps under the various market conditions analyzed. Of the 21 stocks in the data set for this study, 12 were identified as REITs and nine were identified as C corps. REITS

derive their income purely from real estate operations, whereas C corps generally have a blend of real estate and management or franchise operations.

Results

The research objectives were to determine (1) whether historic beta was an appropriate estimate of risk for hotel stocks in up and down markets, and (2) whether there was a difference in beta between hotel REITs and C corps in various market conditions. Table 2 contains information regarding the calculated beta for each stock in the study using the Fama-French three factor model.

Table 2
Hotel company betas derived using Fama-French three-factor model

Stock	Typical Market Beta	Up Market Beta	Down Market Beta
AHT	0.84	0.88	1.47
BEE	1.01	1.12	2.48
CHH	0.73	0.78	1.07
FCH	1.37	0.93	3.60
GET	0.99	1.14	1.75
HOT	1.25	1.31	1.47
HPT	0.87	0.90	1.61
HST	1.06	1.00	1.94
HT	0.59	0.57	1.29
IHR	0.30	0.41	0.51
LDG	0.59	1.17	1.95
LHO	0.96	1.07	1.80
MAR	1.08	1.07	1.18
MCS	1.20	1.46	1.43
MTN	0.98	0.71	1.23
OEH	0.80	0.93	1.48
RLH	0.12	0.28	0.43
SHO	0.72	0.97	2.05
SNSTA	1.76	-0.19	0.56
SPPR	0.15	0.15	1.09
WOLF	1.25	0.93	1.65
Mean (Unweighted)	0.89	0.84	1.53

Hypothesis 1

The study identified a significant difference between CAPM beta for 21 hotel stocks in up and down markets using the S&P 500 Composite Index as the market return. The mean CAPM beta for the up market was 1.06 (SD = 0.50) and the mean CAPM beta for the down market was 1.46 (SD = 0.62). The difference was statistically significant [$t(20) = -3.37, p = 0.003$ (two-tailed)].

Similarly, the study also identified a significant difference between CAPM beta for 21 hotel stocks in up and down markets using the CRSP Value Weighted Index as the market return. The mean CAPM beta for the up market was 1.06 (SD = 0.50) and the mean CAPM beta for the down market was 1.51 (SD = 0.63). The difference was statistically significant [$t(20) = -3.70, p = 0.001$ (two-tailed)].

Finally, the study identified a significant difference between the Fama-French three-factor (FF) beta for 21 hotel stocks in up and down markets using the CRSP Value Weighted Index as the market return along with the FF factors. The mean FF beta for the up market was 0.84 (SD = 0.40) and the mean FF beta for the down market was 1.53 (SD = 0.70). The difference was statistically significant [$t(20) = -5.46, p = 0.000$ (two-tailed)].

Hypothesis 1 is rejected. This finding is notable as it identifies the large difference in beta of hotel stocks in an up market as compared to a down market and indicates that reliance on historical betas may not be appropriate in down markets such as those experienced in 2008.

Hypothesis 2

As hypothesized, the study did not identify a significant difference between CAPM beta for 21 hotel stocks in typical and up markets using the S&P 500 Composite Index as the market return. The mean CAPM beta for the typical market was 0.96 (SD = 0.41) and the mean CAPM beta for the up market was 1.06 (SD = 0.50). The difference was not statistically significant [$t(20) = -1.01, p = 0.325$ (two-tailed)].

Similarly, the study also did not identify a significant difference between CAPM beta for 21 hotel stocks in typical and up markets using the CRSP Value Weighted Index as the market return. The mean CAPM beta for the typical market was 0.99 (SD = 0.41) and the mean CAPM beta for the up market was 1.06 (SD = 0.50). The difference was not statistically significant [$t(20) = -0.79, p = 0.440$ (two-tailed)].

Finally, the study did not identify a significant difference between the Fama-French three-factor (FF) beta for 21 hotel stocks in typical and up markets using the CRSP Value Weighted Index as the market return along with the FF factors. The mean FF beta for the typical market was 0.89 (SD = 0.40) and the mean FF beta for the up market was .84 (SD = 0.40). Again, the difference was not statistically significant [$t(20) = 0.46, p = 0.648$ (two-tailed)].

Hypothesis 2 is rejected. This finding is also important as it indicates that there is a relatively small variance in beta of hotel stocks in a typical market as compared to an up market. This indicates that reliance on historical betas may be more appropriate as a determinant of future performance in typical and up markets.

Hypothesis 3

Given the findings for Hypotheses 1 and 2, it is not surprising that the study also found a significant difference between a typical market and a down market using the S&P 500 Composite Index as the market return. The mean CAPM beta for the typical market was 0.96 (SD = 0.40) and the mean CAPM beta for the down market was 1.46 (SD = 0.62). The difference was statistically significant [$t(20) = -4.05$, $p = 0.001$ (two-tailed)].

Similarly, the study also identified a significant difference between CAPM beta for 21 hotel stocks in typical and down markets using the CRSP Value Weighted Index as the market return. The mean CAPM beta for the typical market was 0.99 (SD = 0.41) and the mean CAPM beta for the down market was 1.51 (SD = 0.63). The difference was also statistically significant [$t(20) = -4.30$, $p = 0.000$ (two-tailed)].

Finally, the study identified a significant difference between the Fama-French three-factor (FF) beta for 21 hotel stocks in typical and down markets using the CRSP Value Weighted Index as the market return along with the FF factors. The mean FF beta for the typical market was 0.89 (SD = 0.40) and the mean FF beta for the down market was 1.53 (SD = 0.70). The difference was statistically significant [$t(20) = -4.35$, $p = 0.000$ (two-tailed)].

Hypothesis 3 is rejected. This finding is of note since most previous studies have considered only up and down markets, but have not reviewed a relatively typical market. This further confirms the concept that beta is different in down markets than in typical or up markets. Table 3 summarizes the results of the paired sample t -tests for Hypotheses 1, 2, and 3.

Table 3
Results of paired-sample t -tests among different beta calculations

Type of Beta	Up Market Beta	Typical Market Beta	Down Market Beta	H ₁ Up vs. Down t -statistic	H ₂ Typical vs. Up t -statistic	H ₃ Typical vs. Down t -statistic
CAPM – S&P 500	1.06	0.96	1.46	-3.37**	-1.01	-4.05***
CAPM – CRSP Value	1.06	0.99	1.51	-3.70**	-0.79	-4.30***
Fama-French	0.84	0.89	1.53	-5.46***	0.46	-4.35***

** $p < .01$ *** $p < .001$

Hypothesis 4

An independent *t*-test was performed to determine if there was a difference between the Fama-French three-factor (FF) betas for the hotel REITs and C corps in an up market. The relationship between REITs and C corps in the up market was not statistically significant [$t(19) = -0.06$, $p = 0.956$ (two-tailed)] and as a result Hypothesis 4 is rejected. The mean FF beta for REITs in the up market was 0.84 (SD = 0.30) and the mean FF beta for C corps in the up market was 0.83 (SD = 0.47).

Hypothesis 5

The same independent *t*-test was performed to determine if there was a difference between the Fama-French three-factor (FF) betas for the hotel REITs and C corps in a typical market. The relationship between REITs and C corps in the typical market was not statistically significant [$t(19) = 0.44$, $p = 0.662$ (two-tailed)] and as a result Hypothesis 5 is rejected. The mean FF beta for REITs in the typical market was 0.84 (SD = 0.34) and the mean FF beta for C corps in the typical market was 0.92 (SD = 0.45).

Hypothesis 6

Finally, an independent *t*-test was performed to determine if there was a difference between the Fama-French three-factor (FF) betas for the hotel REITs and C corps in a down market. The relationship between REITs and C corps in the down market was found to be statistically significant [$t(19) = -2.56$, $p = 0.019$ (two-tailed)] and as a result Hypothesis 6 is rejected. The mean FF beta for REITs in the down market was 1.92 (SD = 0.75) and the mean FF beta for C corps in the down market was 1.22 (SD = 0.50).

Table 4 summarizes the results of the independent-sample *t*-tests between REITs and C corps using Fama-French beta for Hypotheses 4, 5, and 6.

Table 4
Results of independent-sample *t*-tests between REITs and C corps using Fama-French beta

<u>Market Condition</u>	<u>REITs Beta</u>	<u>C Corps Beta</u>	<u><i>t</i>-statistic</u>
Up Market	0.84	0.83	-0.60
Typical Market	0.84	0.92	0.92
Down Market	1.92	1.22	-2.56*

* $p < .05$

Conclusions, Limitations, and Implications

This is the first study to investigate the variability of stock returns across different market return scenarios for hotel stocks. The results of this study indicate that both CAPM beta and Fama-French three-factor beta would have been very poor estimators of hotel stock performance in the downturn of 2008. It is noted that beta calculations were similar in the sample typical- and up-market scenarios. However, beta and, thereby, stock performance relative to standard market indices were dramatically more volatile during the sample down-market period. This finding has important implications for researchers and practitioners, as many practitioners rely on various measures of historic beta in the construction of stock portfolios.

It is important to note that the Fama-French three-factor model indicates a much closer relationship between the typical-market beta and the up-market beta than do either of the CAPM betas. In addition, the Fama-French three-factor model indicates a much more significant difference between both the typical-market beta and the up-market beta and the down-market beta than do either of the CAPM betas. These findings are indicative of the previously established higher validity afforded the Fama-French three-factor model. The study also found that the Fama-French three-factor betas had higher explanatory power (r^2) than either of the CAPM betas, explaining 49 percent of the variance in the relationship in the down-market scenario as compared with 41 percent and 42 percent for the S&P 500 Composite Index CAPM beta and CRSP Value Weighted Index beta, respectively.

Based on an analysis of historic beta for hotel stocks included in portfolios prior to the downturn of 2008, investors would have expected the hotel stocks to perform at levels roughly approximating the market return. In fact, the returns for hotel stocks during 2008 were over 50 percent more volatile than the market indices reviewed and in a negative direction. The financial implications of this added volatility during a market downturn are distinct and severe and should serve as a cautionary warning to investors. Further research should focus on the levels of change in the economic fundamentals of hotel stocks during this period to determine what impact they may have had on price activity in these stocks.

The study's findings regarding the difference in performance between hotel REITs and C corps are also significant. While previous studies have identified differences in economic fundamentals between REITs and C corps (Ghosh, Miles, & Sirmans, 1996; Tang & Jang, 2008), they have not investigated differences in price activity and common risk measures such as beta. The findings of this study point to a dramatic difference in performance between REITs and C corps during the down market and a risk relationship that is not adequately accounted for by beta. Historically, studies have identified very low betas for REITs (Corgel & Djoganopoulos, 2000; Ghosh et al.), which is contradicted by the data in this study. It is possible that hotel REITs are more volatile than hotel C corps due to their higher leverage as it relates to net income being derived from real estate

operations rather than management or franchising. This effect would have been expected to be persistent during the up market as well. Further research in this area should focus on the reasons for the difference in price activity and risk measures between companies operating under these two investment structures.

Limitations to this study include the analysis of hotel stocks only during three distinct periods designed to represent typical, up, and down markets. Further studies could identify additional periods representing these different markets for analysis. This study could also be extended to analyze restaurant and other hospitality companies over these periods to determine whether or not the effects identified are persistent among all hospitality companies.

In conclusion, various calculations of beta were very poor predictors of the performance of hotel stocks during the market downturn of 2008. While further investigation is necessary, researchers and practitioners should proceed with caution in their use of beta as a predictive tool for stock performance under varying market conditions, as past performance certainly does not guarantee future results.

References

- Black, F. (1993). Beta and return. *Journal of Portfolio Management*, 20 (1), 8–18.
- Chen, S. N. (1982). An examination of risk-return relationship in bull and bear markets using time-varying betas. *Journal of Financial and Quantitative Analysis*, 17 (2), 265–286.
- Corgel, J. B., & Djoganopoulos, C. (2000). Equity REIT beta estimation. *Financial Analysts Journal*, 56 (1), 70–79.
- Fabozzi, F. J., & Francis, J. C. (1977). Stability tests for alphas and betas over bull and bear market conditions. *Journal of Finance*, 32 (4), 1093–1099.
- Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *Journal of Finance*, 47 (2), 427–465.
- Fama, E. F., & French, K. R. (1996). The CAPM is wanted, dead or alive. *Journal of Finance*, 51 (5), 1947–1958.
- French, K. R. (n.d.). *Data Library*. Retrieved April 1, 2009 from http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library.
- Ghosh, C., Miles, M., & Sirmans, C. F. (1996). Are REITs stocks? *Real Estate Finance*, 13, 46–53.

Gu, Z., & Kim, H. (2003). An examination of the determinants of hotel REITs' unsystematic risk. *Journal of Hospitality & Tourism Research*, 27 (2), 166–184.

Jackson, L. A. (2007). Lodging REIT performance and comparison with other equity REIT returns. Ph.D. dissertation, Oklahoma State University, United States—Oklahoma. Retrieved November 1, 2008, from Dissertations & Theses: Full Text database. (Publication No. AAT 3259595).

Jackson, M., & Staunton, M. (2001). *Advanced modelling in finance using Excel and VBA*. New York: Wiley.

Kim, H., & Gu, Z. (2003). Risk-adjusted performance: A sector analysis of restaurant firms. *Journal of Hospitality & Tourism Research*, 27 (2), 200–216.

Kim, H., Gu, Z., & Mattila, A. S. (2002). Hotel real estate investment trusts' risk features and beta determinants. *Journal of Hospitality & Tourism Research*, 26 (2), 138–154.

Kim, H., Mattila, A. S., & Gu, Z. (2002). Performance of hotel real estate investment trusts: a comparative analysis of Jensen indexes. *International Journal of Hospitality Management*, 21 (1), 85–97.

Kim, M. K., & Zumwalt, J. K. (1979). An analysis of risk in bull and bear markets. *Journal of Financial and Quantitative Analysis*, 14 (1), 1015–1025.

Lee, S. (2008). Examination of various financial risk measures for lodging firms. *Journal of Hospitality & Tourism Research*, 32 (2), 255–271.

Lee, S., & Upneja, A. (2007). Does Wall Street truly understand valuation of publicly traded lodging stocks? *Journal of Hospitality & Tourism Research*, 31 (2), 168–181.

Lee, S., & Upneja, A. (2008). Is capital asset pricing model (CAPM) the best way to estimate cost-of-equity for the lodging industry? *International Journal of Contemporary Hospitality Management*, 20 (2), 172–185.

Levy, R. A. (1974). Beta coefficients as predictors of return. *Financial Analysts Journal*, 30 (1), 61–69.

Madanoglu, M., & Olsen, M. D. (2005). Toward a resolution of the cost of equity conundrum in the lodging industry: a conceptual framework. *International Journal of Hospitality Management*, 24 (4), 493–515.

Madanoglu, M., Olsen, M. D., & Kwansa, F. A. (2005). Empirical investigation of the CAPM vs. Fama-French model: Evidence from the lodging industry. *The Journal of Hospitality Financial Management*, 13 (1), 127.

Mao, Z., & Gu, Z. (2007). Risk-adjusted stock performance: A cross-sector analysis of hospitality firms in the recent economic downturn. *International Journal of Hospitality and Tourism Administration*, 8 (4), 77–98.

Markowitz, H. (1952). Portfolio selection. *Journal of Finance*, 7 (1), 77–91.

National Association of Real Estate Investment Trusts. (n.d.). *All about REITs*. Retrieved April 1, 2009 from <http://www.reit.com/AllAboutREITs/tabid/54/Default.aspx>.

Pettengill, G. N., Sundaram, S., & Mathur, I. (1995). The conditional relation between beta and returns. *Journal of Financial and Quantitative Analysis*, 30 (1), 101–116.

Sharpe, W. F. (1963). A simplified model for portfolio analysis. *Management Science*, 9 (2), 277–293.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19 (3), 425–442.

Tang, C. H., & Jang, S. C. (2008). The profitability impact of REIT requirements: A comparative analysis of hotel REITS and hotel C corporations. *International Journal of Hospitality Management*, 27 (4), 614–622.

Weinbaum, D. (2009). Assessing the historical performance of hospitality stocks: The investor's perspective. *Cornell Hotel and Restaurant Administration Quarterly*, 50 (1), 113–125.

Wiggins, J. B. (1992). Betas in up and down markets. *Financial Review*, 27 (1), 107–123.

Womack, K., & Zhang, Y. (2003). *Understanding risk and return, the CAPM, and the Fama-French three-factor model* (Vol. 03-111). Hanover, NH: Trustees of Dartmouth College.

Zietz, E. N., Sirmans, G. S., & Friday, H. S. (2003). The environment and performance of real estate investment trusts. *Journal of Real Estate Portfolio Management*, 9 (2), 127–165.

Barry A. N. Bloom is a Ph.D. student in Foodservice and Lodging Management at Iowa State University.

