EVA momentum as a performance measure in the United States lodging industry

by

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TABLE OF CONTENTS

LIST OF FIGURES ........................................................................................................ iv
LIST OF TABLES ........................................................................................................... v
ABSTRACT .................................................................................................................. vi

CHAPTER 1. INTRODUCTION ..................................................................................... 1
  Overview .................................................................................................................... 1
  Background of the Study ......................................................................................... 2
  Significance of the Study ......................................................................................... 4
  Purpose of the Study ............................................................................................... 4
  Assumptions ............................................................................................................ 6
  Definitions of Terms ............................................................................................... 6
  Dissertation Organization ....................................................................................... 8

CHAPTER 2. REVIEW OF LITERATURE ..................................................................... 9
  Lodging Industry Performance Measurement Research ................................... 9
    Accounting/Financial ......................................................................................... 10
    Balanced Scorecard ........................................................................................... 11
    Data Envelopment Analysis .............................................................................. 16
    Human Resource ................................................................................................. 22
    Guest Service/Satisfaction ................................................................................. 25
    Other Performance Measurement Research ................................................... 28
  Economic Value Added ........................................................................................ 32
    Framework .......................................................................................................... 32
    EVA and Traditional Performance Measures ..................................................... 34
    EVA Adjustments ............................................................................................... 36
    EVA Adopters and Nonadopters ....................................................................... 38
    EVA and Human Resources .............................................................................. 40
    EVA and the Hospitality Industry ................................................................... 41
    EVA as a Predictive Measure ............................................................................ 43
    EVA Momentum ................................................................................................. 51
  Hypotheses ............................................................................................................. 52

CHAPTER 3. METHODS AND PROCEDURES .......................................................... 57
  Sample ..................................................................................................................... 57
  Research Design .................................................................................................... 59
  Data Analysis ......................................................................................................... 62

CHAPTER 4. RESULTS ............................................................................................. 63
  Hypothesis 1 .......................................................................................................... 64
  Hypothesis 2 .......................................................................................................... 66
  Hypothesis 3 .......................................................................................................... 68
Hypothesis 4......................................................................................................................... 70
Additional Results.................................................................................................................. 72
Hypothesis 5.......................................................................................................................... 73

CHAPTER 5. SUMMARY AND DISCUSSION ........................................................................ 78
  Summary of Findings............................................................................................................. 78
  Limitations of the Study........................................................................................................ 82
  Recommendations for Future Research .............................................................................. 82

APPENDIX. SUPPLEMENTAL MATERIAL .......................................................................... 84

REFERENCES ....................................................................................................................... 99

ACKNOWLEDGEMENTS ..................................................................................................... 114
LIST OF FIGURES

Figure 1. Pooled and individual year lodging and restaurant EVA momentum comparison from 2001-2008 .................................................65

Figure 2. Pooled and individual year lodging and REIT EVA momentum comparison from 2001-2008 .................................................................67
LIST OF TABLES

Table 1.  T-Test and ANOVA Descriptive Statistics for EVA Momentum from 2001–2008 ..........................................................63
Table 2.  Regression Model Descriptive Statistics for EVA Momentum from 2001-2008 ..............................................................64
Table 3.  Two-Tail t-Test Comparing Lodging and REIT EVA Momentum ........................................65
Table 4.  One-way ANOVA Comparing Lodging and REIT EVA Momentum .............................67
Table 5.  Pooled Regression Analysis Predicting Market Capitalization from 2001-2008 .........................69
Table 6.  Pooled Regression Analysis Predicting Total Capitalization from 2001–2008 ..........................71
Table 7.  Pearson's Correlation Matrix ..................................................................................74
Table 8.  Pooled Regression Analysis Predicting Market Capitalization from 2001–2008 ...75
Table 9.  Pooled Regression Analysis Predicting Total Capitalization from 2001–2008 ......76
Table A1. Performance Measurement Research in the Lodging Industry ..............................85
Table A2. Economic Value Added (EVA)-related Research .................................................91
Table A3. EPS to EVA Reconciliation Report—Starwood Hotels & Resorts Worldwide, Inc. ($ millions) ..........................................................97
Table A4. Summary NOPAT Reconciliation Report - Starwood Hotels & Resorts Worldwide, Inc. ............................................................................98
ABSTRACT

Numerous measures and metrics are used to evaluate lodging unit and company performance, but no single measure has been identified that captures the financial performance of a lodging firm. EVA Momentum emerged in 2009 as the newest economic value added (EVA)-related business performance measure. The objective of this study was to understand the value of EVA Momentum as a performance measure in the U.S. lodging industry by: (a) comparing EVA Momentum in similar and dissimilar industries, (b) determining if EVA Momentum was related to future value, and (c) understanding if EVA Momentum was more highly related to future performance than were traditional financial performance measures.

Compustat and evaDimensions financial data from 2001–2008 for U.S.-based hotel, restaurant, and REIT companies were used in this study. T-test results showed no statistically significant difference between lodging and restaurant EVA Momentum. ANOVA test results found lodging EVA Momentum was higher than for fixed asset-intensive REITs, but the results were not statistically significant. Regression results showed EVA Momentum was not related to future financial performance as measured by market capitalization or total capitalization. Regression results also showed EVA Momentum was more highly related to future performance than were return on assets, return on sales, and earnings per share for the pooled sample, but not for the individual lodging, restaurant, and REIT samples.

This is the first known empirical study of EVA Momentum as a performance measure. The results of the study provided support for using EVA Momentum to compare company performance across different industries, but did not find that EVA Momentum was
related to future financial performance. Using a pooled sample, EVA Momentum was shown to be more highly related to future financial performance than were three traditional financial measures.
CHAPTER 1. INTRODUCTION

Overview

Numerous measures and metrics are used to understand the performance of lodging industry units and companies. Industry practitioners, public company analysts, and investors employ historic financial measures and industry-specific metrics to understand the past and to predict the future financial performance of lodging units and companies. To date, no single performance measure has been identified that captures the historic financial performance and explains the future performance of a lodging firm. Economic value added (EVA) was proposed over two decades ago as a residual income-based financial performance measure that uses components of the income statement and balance sheet as well as the cost of capital to provide a single performance measure (Stewart, 1991). A series of EVA-related measures were subsequently introduced and examined to determine the value of EVA as a performance measure. Evidence that EVA or EVA-based measures are related to future financial performance has been inconclusive.

EVA Momentum® ("EVA Momentum") is a registered trademark of evaDimensions. In 2009 EVA Momentum emerged as the newest EVA-related business performance measure. Stewart (2009) stated that EVA Momentum is "the one ratio that tells the whole story" (p. 74). Colvin (2010) stated in Fortune that savvy investors and managers will focus on EVA Momentum. EVA Momentum has not been empirically investigated in any known previous study. This research investigated the development of EVA and EVA Momentum, compared historic performance as measured by EVA Momentum across related industry and asset types, and compared EVA Momentum’s predictive ability to other widely adopted financial performance measures.
Background of the Study

Lodging industry performance measurement is rooted in accounting and financial reporting. The *Uniform System of Accounts for the Lodging Industry* (Hospitality Financial and Technology Pro, 2006) was first published in 1926 and defined a consistent approach for income statement and balance sheet reporting for lodging properties and parent companies. The chart of accounts detailed in the *Uniform System of Accounts for the Lodging Industry* has been widely implemented, and the adoption of a consistent chart of accounts has facilitated lodging property and company comparisons. The *Uniform System of Accounts for Restaurants* provides a similar template for restaurant accounting and comparability (DeFranco & Graves, 1996).

Lodging industry performance measurement has advanced significantly since oversupply and passive tax law changes resulted in $13.9 billion of losses in the U.S. lodging industry from 1986 through 1993 (Ross, 1998). After implementing an initial wave of cost reductions, the lodging industry responded with a greater emphasis on revenue management, which resulted in the adoption of revenue per available room (RevPAR) as a widely accepted performance measure (Cross, Higbie, & Cross, 2009). During this same time period, G. Bennett Stewart (1991) introduced EVA in his seminal work *The Quest for Value*. EVA extended the concept of residual income as a measure of earnings in excess of the opportunity cost of equity capital invested by shareholders (Forker & Powell, 2008). EVA is derived using adjusted income statement earnings and balance sheet capital amounts as well as return on capital amounts to produce an intuitively appealing measure of business performance.
Numerous research studies were published after a *Fortune* magazine cover story featured Stern Stewart & Co.’s EVA practice (Tully, 1993). Subsequent research focused on the application of EVA to company and division results, EVA as an incentive compensation tool, the use of complex financial adjustments to arrive at net operating profit after taxes (NOPAT) and capital deployed, and EVA-related measures. EVA-related measures include refined EVA (REVA), which replaces book value with market value in the traditional EVA calculation (Bacidore, Boquist, Milbourn, & Thakor, 1997). Bacidore et al. (1997) reported increased REVA corresponded to increased market capitalization, and Griffith (2006) showed market value was related to EVA. Additional studies reported mixed reviews on EVA as a performance measure (Abate, Grant & Steward, 2004; Ferguson, Rentzler, & Yu, 2005; Lee & Kim, 2009).

Stewart (2009) introduced EVA Momentum as a new financial measurement tool. He described the theoretical weaknesses of using sales growth rate, earnings per share, market share, profit margin, and return on capital measures and stated EVA Momentum was the best performance measurement tool. Stated as a percentage, EVA Momentum is the change in economic income, as measured by EVA, relative to prior period sales. Stewart (2009) described EVA Momentum as an economic measure that is size-neutral, market-calibrated, and presented as a percentage measure that can be used to compare companies across different sizes and industries. He stated EVA Momentum can be used to compare company divisions, is risk adjusted for the market costs of debt and equity, and provides a clear measure of good, neutral, or bad financial performance. Stewart (2009) also suggested EVA Momentum is an early warning system for financial managers and that negative historic EVA
Momentum trends alert owners and managers of poor performance and potential value deterioration.

**Significance of the Study**

Understanding which performance measures most accurately depict the performance of a lodging or restaurant company can be a difficult task that requires a significant investment in training and research. Numerous performance measures are used in the lodging industry, but no single measure may fully capture the customer dynamics, competitive arena, capital invested, and macroeconomic environment. EVA Momentum has been put forward as the single measure that best captures past performance and signals the future financial performance of a firm (Stewart, 2009).

Evidence supporting whether EVA and EVA-related measures are related to financial performance has not been conclusive. Additionally, EVA and EVA-related research in the lodging and restaurant industry has been limited. EVA Momentum is a new measure that has not been empirically investigated, and no known previous EVA Momentum-related research has been published for any industry. This study extends previous lodging industry EVA-related research and is the first known study that empirically investigates EVA Momentum as a performance measure.

**Purpose of the Study**

Stewart (2009) stated EVA Momentum is the single best performance measure. He has suggested EVA Momentum captures the economic performance of a firm and provides stakeholders with an early warning signal of future performance. EVA Momentum is calculated using adjusted generally accepted accounting principles (GAAP) financial statement earnings, adjusted publicly held capital amounts, stakeholder return requirements,
and recent sales information. Specifically, EVA Momentum is the change in current period EVA divided by prior period sales. The purpose of this study was to investigate EVA Momentum as a performance measure in the lodging industry and understand if EVA Momentum is related to financial performance. This study reviews performance measurement techniques used in the lodging industry, includes a discussion of the development of EVA and EVA-related measures from inception through the introduction of EVA Momentum, compares EVA Momentum performance in lodging to a related industry, compares EVA Momentum results for lodging companies with fixed asset-intensive companies, and explores the relationship between EVA Momentum and future financial performance. Specifically, the objectives of this study were to:

1. Compare EVA Momentum in similar industries to determine if there is a difference between lodging and restaurant performance as measured by EVA Momentum.

2. Understand if EVA Momentum can be compared across different industries by determining if EVA Momentum at fee-income producing lodging companies with a relatively lower fixed asset base is higher than at fixed asset-intensive companies.

3. Determine if lodging, restaurant, and real estate investment trust (REIT) EVA Momentum is related to future financial performance as measured by market and total capitalization.

4. Understand if EVA Momentum is more highly related to future financial performance than are traditional financial performance measures.
Assumptions

This study was conducted under the following assumptions:

1. EVA Momentum and EVA calculations from Bennett Stewart’s evaDimensions LLC database were consistently and accurately applied to all companies.

2. Standard & Poor’s Compustat financial data used in this research accurately reflected the GAAP financial statement results for the sample companies.

Definitions of Terms

*Capital asset pricing model (CAPM)*: Developed byLintner (1954) and Sharpe (1964), CAPM describes the relationship between a security’s return and the market’s return. CAPM is calculated as \( R = R_f + \beta (K_m - R_f) \), where \( R \) is the expected return, \( R_f \) is the risk free rate, and \( K_m \) is the rate of return of the appropriate asset class. Beta measures the volatility of a firm’s securities relative to its asset class.

*Economic value added (EVA)*: net operating profit after taxes (NOPAT), less the product of the weighted average cost of capital (WACC) and the total of debt and equity capital.

*Earnings before interest and taxes (EBIT)*: a GAAP measure of net income plus interest and income tax expense.

*Earnings before interest, taxes, and depreciation (EBITDA)*: a non-GAAP measure of a firm’s cash from operations without considering the effects of balance sheet changes.

*Earnings per share (EPS)*: fully diluted earnings per share including extraordinary items.

*Efficient market hypothesis (EMH)*: information is readily available and average risk-adjusted excess market returns cannot be achieved in the long-run.

*EVA Momentum*: the change in EVA from the prior period divided by prior period sales (Stewart, 2009).
Generally accepted accounting principles (GAAP): financial accounting standards; Board (FASB) Standards and Interpretations, Accounting Research Bulletins (ARB), Accounting Principles Board (APB) Opinions, and other bulletins, guides, and statements used to prepare financial statements. In the United States, GAAP is applied to private, public, and non-profit organizations (Kieso, Weygandt, & Warfield 2004).

Internal rate of return (IRR): the discount rate, which when applied to future cash flows, results in a present value amount equal to the initial capital investment.

Leverage: the use of debt in a firm’s capital structure to increase returns to equity holders.

Market capitalization: the market value of outstanding equity securities.

Market value added (MVA): the difference between the market value of debt and equity and the capital invested in the firm (Kramer & Peters, 2001).

Net operating profit after taxes (NOPAT): after tax profit from operations, net of depreciation and amortization expense but before financing costs and other adjustments.

Pro forma earnings: GAAP income adjusted for non-recurring or unusual items.

Refined economic value added (REVA): Net operating profit after taxes (NOPAT), less weighted-average cost of capital ($k_w$), times the sum of the end-of-period market value of equity and market value of debt net of current liabilities (MV$_{t-1}$) (Bacidore et al., 1997).

Revenue per available room (RevPAR): room revenue divided by number of available rooms; alternatively, average daily room rate times occupancy percentage.

Residual income: accounting profit in dollars less capital charges based on invested capital (Dillon & Owers, 1997).
Return on assets (ROA): net income divided by total assets.

Return on sales (ROS): net income divided by total sales.

Value-based management (VBM): “a management philosophy that uses analytical tools and processes to focus an organization on the single objective of creating shareholder value” (Athanassakos, 2007, p. 1397).

Weighted average cost of capital (WACC): \( r_D \cdot (1 - T_C)(D/V) + r_E \cdot (E/V), \) where \( r_D \) equals borrowing costs, \( T_C \) is the tax rate, \( r_E \) is the expected return on the firm’s equity, \( D \) is the market value of debt, \( E \) is the market value of equity, and \( V \) is the total value of the firm (Brealey & Myers, 1984).

**Dissertation Organization**

The introduction is followed by the review of literature, methods and procedures, results, summary and discussion, appendices, and reference sections. Appendices include materials relevant to the research.
CHAPTER 2. REVIEW OF LITERATURE

This literature review is organized to provide an overview of lodging industry performance measurement research from 2000–2010, to explore the development of EVA EVA-related research, to introduce EVA Momentum, and to develop the hypotheses for this study.

Lodging Industry Performance Measurement Research

Recent lodging industry research has explored a number of non-accounting-related measures. Lodging industry performance measurement has evolved from an accounting-based approach to the adoption of RevPAR, balanced scorecard (BSC), human resource, guest satisfaction, and other measurement techniques. The establishment of STR Global in 1985 led to the dissemination of comparative information across price segments, geographic boundaries, and hotel sizes that facilitated industry-wide performance benchmarking (STR Global, 2010). The introduction of RevPAR over 20 years ago provided the lodging industries’ most widely accepted non-accounting metric. Earnings before interest, taxes, and depreciation (EBITDA), a non-GAAP term, and earnings before interest and taxes (EBIT) are commonly used by major lodging companies when reporting results and by financial analysts when making securities recommendations. This section discusses the most common non-EVA-related lodging performance measurement research threads from 2000–2010. These include accounting and financial, BSC, data envelopment analysis, human resource, guest service/satisfaction, and other lodging performance measurement research. In addition, this section discusses selected restaurant and other hospitality performance measurement literature. Table A1 (in the appendix) summarizes lodging industry-related performance measurement research published from 2000–2010.
Accounting/Financial

Lodging industry accounting- and financial-based performance measurement techniques are highly developed. The *Uniform System of Accounts for the Lodging Industry* (Hospitality Financial and Technology Pro, 2006) provides a template for accounting measurement that is tailored to and widely adopted by the industry. Recent lodging research has concentrated on introducing new financial metrics and understanding the predictive value of financial performance measures. Ganchev (2000) reviewed methodology to measure value drivers that determined the value of a hotel asset. The four-step methodology involved developing the cash-flow forecast, determining the appropriate time horizon, estimating value drivers and reversion, and discounting the cash flow. The study included an early explanation and example of EVA in the hospitality industry.

Ryu and Jang (2004) compared 10 traditional financial ratios for commercial and casino hotel companies for the period from 1998–2002. The ratios measured were current, quick, total asset-to-total liability, times interest earned, profit margin, cash flow from operations to current liabilities, cash flow from operations to total liabilities, cash flow interest coverage, cash flow margin, and cash flow from operations to net income. The results showed financial measures differed across segments of the hospitality industry. Casino companies reported better liquidity measures than did commercial hotel companies.

Mongiello and Harris (2005) reported on eight interviews with industry managers to better understand managerial accounting’s linkage to corporate governance in international hotel companies. The authors identified the need to provide a cohesive reporting framework between owners, corporate managers, and hotel general managers. Mongiello and Harris reviewed communication systems to share best practices from “centre-to-units and units-to-
centre” (p. 368). Management by values (MBV) goals and management by objectives (MBO) targets were explored. Interestingly, the results showed hotel general managers used a wider range of performance indicators than the indicators required by corporate management.

Future research will continue to use accounting-based information to understand lodging performance measures. Research will concentrate on measures that have predictive value, identify activities that contribute to value creation, and compare traditional financial measures with alternative performance measures at lodging properties and companies.

**Balanced Scorecard**

Lodging industry BSC research in the last decade has moved from an accounting and finance measurement focus to recognizing measures that relate to customers, employees, and service areas. Kaplan and Norton (1992) introduced the BSC and provided a template for BSC implementation at a hypothetical company. Although not specific to the lodging industry, Kaplan and Norton’s (1992) seminal work served as the basis for subsequent lodging-related BSC research. They defined the BSC as “a set of measures that gives top managers a fast but comprehensive view of the business” (p. 71). Kaplan and Norton (1992) argued that financial measures are valuable, but provide a backward looking view of one aspect of a company’s performance. The authors stated no single measure is adequate for a business to determine performance and the BSC should be used to link perspectives in four key performance measurement areas, namely customer, innovation and learning, internal, and financial perspectives. Kaplan and Norton (1993) followed their groundbreaking 1992 BSC work with examples of early BSC adopters. Adopters included a Halliburton subsidiary, Advanced Micro Devices (AMD), and Apple.
Denton and White (2000) completed a case study of White Lodging Service’s implementation of a BSC system. The BSC model developed by White followed the format originated by Kaplan and Norton (1992) and showed the relationship between attracting and retaining employees, executing best practices, enhancing guest satisfaction, and achieving financial success. Specific metrics were identified to measure each of the BSC quadrants. In one of the most detailed lodging industry performance measurement papers, Denton and White provided a roadmap for the successful implementation of a BSC and specific hotel-related measurement metrics. The roadmap was an important contribution for lodging practitioners desiring to enhance and expand hotel performance measurement systems. The authors noted the BSC can be used to better align the interests of lodging property and hotel management companies. This research could be extended to full service hotels and hotel companies to better understand performance measures in complex operations and to determine if adopters of BSCs achieve improved results.

Harris and Mongiello (2001) surveyed leaders from different hotel brands to understand key performance indicators adopted by general managers and to understand the interpretation and use of these indicators in the decision-making process. The model developed by Harris and Mongiello described the hotel manager decision-making process as selecting the performance indicator, interpreting the indicator, and making the decision. The study showed that human resource, operations, and customer perspectives were most important to managers. The companies’ comparative profiles revealed which branded hotel managers emphasized customer, operations, finance, or human resources approaches to decision making. The authors ranked the top 10 performance measures and found competitor benchmarking was the highest ranked measure, with gross operating profit percentage.
Harris and Mongiello provided a detailed BSC article that is relevant to industry practitioners.

Atkinson and Brown (2001) surveyed 88 United Kingdom-based lodging companies to understand the use of financial and nonfinancial performance measures. A 20% response rate showed that performance measurement was focused primarily on financial measures. Atkinson and Brown reported that service quality, customer satisfaction, sales growth, customer loyalty, and market share were the most commonly used nonfinancial measures. The authors concluded that lodging companies focused on historic measures and not on factors that influenced future performance. Atkinson and Brown reported an increased use of new measures at United Kingdom (U.K.) and U.S. lodging companies that better linked financial with employee and customer measures.

Doran, Haddad, and Chow (2002) reviewed BSC implementation at Hilton Hotels and White Lodging Services. Five hotel general managers were interviewed to better understand the benefits of a BSC system. Detailed BSC measures were reported and a four-stage implementation model was presented. This research extended Denton and White (2000), provided a model for a BSC implementation at lodging companies, and reviewed BSC-related pitfalls. Pitfalls included lack of a clear strategy, not understanding what the BSC will accomplish, confusing data with information, not recognizing the links between BSC measures, not obtaining employee buy-in, failing to respond to results, failing to understand that the BSC is not static, and failing to review strategy to ensure BSC feedback is appropriate.

Evans (2005) reviewed hotel-related BSC literature and completed an exploratory study of three- and four-star hotels in the U.K. to compare existing literature to actual
practices. The survey questionnaire was designed around the four BSC components developed by Kaplan and Norton (1992). Evan’s research was limited by the sample and the absence of an in-depth questionnaire. Additional research is necessary to better understand how strategy and vision should be related to the BSC.

Phillips and Louvieris (2005) interviewed 10 executives from U.K.-based hotels, pubs, restaurants, leisure facilities, and visitor attractions to understand performance measurement best practices at small, medium-sized enterprise (SME) organizations. This exploratory case study utilized interviews of 38 SME stakeholders to determine detailed performance measurement research areas. The telephone survey explored organization information, financial information systems, information sources, current measurement practices, targets, revenue management, and future development of performance measurement. The respondents’ suggestions included collecting and computerizing critical financial information, linking forecasting and management information systems, building customer profiles and relationships, measuring quality, investing in staff, measuring productivity, and benchmarking. Phillips and Louvieris summarized the four important BSC concepts as budgetary control, customer relationship management, strategic management, and collaboration. The survey yielded high-level comments but contributed little to performance measurement or benchmarking research in the lodging industry.

Park and Gagnon (2006) surveyed managers and executives at 129 Korean hotels to test six hypotheses concerning the causal relationships among BSC perspectives. Structural equation modeling (SEM) was used to address potential latent variable issues. The results showed learning and growth positively affected internal business process, internal business process positively affected customer perspective, customer perspective positively affected
financial performance, and higher levels of internal business process resulted in higher levels of financial perspective performance. Demonstrating the linkage of the BSC perspectives in hotels was an important contribution to industry practitioners and BSC literature.

Phillips (2007) completed a three-year longitudinal case study of a BSC used at a major U.K.-based lodging company to understand the use of a BSC as a “strategic control tool” (p. 736). Phillips stated the BSC should be used as a strategic control tool to better understand performance measurement indicators and to achieve strategic objectives. Phillips suggested companies should benchmark against the highest performing competition. Marketing was identified as a key factor in organization success that should be measured with a BSC.

Cruz (2007) used semi-structured interviews of 24 hotel managers and local lodging ownership partners to understand performance measurement methods. The study explored the weaknesses of historic budget processes and how lodging units implemented rolling forecasts to shift management focus to forward-looking performance. The local lodging unit owners developed an electronic dashboard that replicated some features of a BSC, including RevPAR and other performance measures. A weakness of the study was the exclusion of the global brand managers in the sample. Future research should investigate the use of electronic dashboards in lodging units and global hospitality companies to determine if electronic dashboard implementation yields improved results.

Hao-Chen, Wenyi, and Wei-Kang (2007) developed a model to study the relationships between the learning and growth, internal process, customer, and financial perspectives of the BSC at 186 three-, four-, and five-star Chinese hotels. Structural equation modeling (SEM) was used to test the theoretical model and three modified models. A
strategy map showed the relationships between the four BSC perspectives and the sampled hotels’ missions. This research presented a rigorous approach to, and developed a new understanding of, the BSC in lodging. The results showed learning and growth, internal process, and customer perspectives were related to financial performance measures. Learning and growth was positively related to internal process, which was positively related to the customer and financial perspectives. This research and the resulting strategy map could be extended to samples outside China.

BSC, in contrast to a single best measure as suggested by supporters of EVA Momentum, relies on using multiple performance measures. Recent BSC-related lodging research is relevant to practitioners, and future research should use broader industry samples and provide more specific examples of hotel metrics used in BSCs. Additionally, research should attempt to determine if lodging companies or individual lodging properties that implement BSC reporting outperform non-BSC companies and properties.

Data Envelopment Analysis

Data envelopment analysis (DEA) was developed by Farrell (1957) and Charnes, Cooper, and Rhodes (1978). DEA has been used to measure the relative efficiency of decision-making units (DMUs) and benchmark DMU efficiency using inputs and outputs. DEA has been one of the most extensively researched topics in the lodging area in the last decade.

Tsaur (2001) used DEA to measure the relative efficiency of 53 tourist hotels in Taiwan. Tsaur used seven inputs and six outputs from 1996–1998 to rank hotels based on efficiency. The inputs were operating expenses, number of employees, number of guest rooms, catering floor space, rooms division employees, catering division employees, and
catering costs. Model outputs were operating revenues, number of rooms occupied, average daily rate, the ratio of catering revenues to catering employees, room division revenues, and catering division revenues. The results showed total hotel, rooms division, and catering division efficiency rankings. The highest individual hotel efficiency score indicated there was an opportunity to increase efficiency across the sample hotels by reducing inputs relative to outputs. Chain hotels reported higher efficiency scores than did unaffiliated hotels. Hotels with individual guests outperformed hotels with a larger base of group business. Although the earliest published lodging DEA article in this review, Tsaur used one of the most robust sets of inputs and outputs in lodging DEA-related research.

Christou and Sigala (2002) reviewed the challenges associated with measuring service quality and discussed the application of total quality management (TQM) in the hospitality industry. Christou and Sigala indicated the success of implementing a TQM solution was dependent on an organization’s ability to measure TQM efforts. A hospitality service total quality (HOSTQUAL) model was introduced to provide a framework for future empirical studies. DEA was recommended as the best approach for measuring TQM using the HOSTQUAL model. The model was:

\[
\text{HOSTQUAL efficiency score} = \frac{\text{CRA}}{\text{HIS}+\text{RCM}+\text{HRSE}},
\]

where CRA was the cost and revenue advantage, HIS was hospitality service and process improvement, RCM was response to customer and hospitality market orientation, and HRSE was human resource superiority and excellence. The proposed independent variables are not easily measured and the Christou and Sigala model has not been empirically tested in subsequent lodging industry DEA research.
Hwang and Chang (2003) used DEA to measure efficiency in 45 Taiwanese hotels. Using four input and three output factors, the results ranked the sample hotels based on efficiency. Efficiency changes were measured over a five-year period to determine which properties were improving efficiency and becoming more competitive. A management decision matrix showing efficiency change and relative efficiency advanced the application of DEA to hotels. Hwang and Chang’s methodology and reporting format should be further tested with lodging unit samples in markets outside Taiwan.

Hu and Cai (2004) used DEA to measure labor productivity in 242 California bed and breakfast, limited-, and full-service hotels. Model inputs were the number of full- and part-time employees, and the single output was room revenue. The results showed bed and breakfast properties were most productive. Regression results showed average daily room rate was significant in explaining the difference in labor productivity in limited-service properties. Commercial luxury hotels were less productive than were bed and breakfast or limited-service hotels, and occupancy did not explain productivity variances in the three hotel segments. Highly paid managers operated hotels with higher labor productivity. This research was important in extending DEA results with a regression model to explain the underlying performance across hotel size, quality, employee wages, and volume. Sample issues limited making inferences. Additionally, using full- and part-time headcount input as input factors did not consider the complexity or mix of food and beverage operations in lodging units.

Chiang, Tsai, and Wang (2004) used DEA to compare efficiency at Taiwanese franchised, internationally managed, and independently owned and operated hotels. Four inputs, including yielding which is the ratio of individual hotel RevPAR and market
RevPAR, and three output variables were used. The results for the 24-hotel sample did not show franchised, international, or independently owned and operated hotels were more efficient. The use of yielding and comparison of hotel types contributed to DEA research.

Sigala (2004) surveyed three-star, full-service U.K.-based hotels to demonstrate how step-wise DEA can be used to measure hotel productivity. Defining inputs and outputs, measuring inputs and outputs, and *ceteris paribus* were described as problems when using DEA. *Ceteris paribus* referred to “holding the influences constant when examining the impact of a particular factor on productivity” (p. 41). The step-wise process involved varying the inputs and outputs to understand the factors’ impact on efficiency scores. Results for all hotels surveyed using four different step-wise models showed productivity was significantly affected by the hotel design, ownership, and management situation. Chain hotels outperformed independent hotels. Sigala demonstrated how inputs and outputs can be isolated in a DEA model to better understand productivity factors.

Barros (2005) used DEA to estimate a production frontier for 43 small Portuguese hotels. Using seven inputs and three outputs, the study ranked the hotels from most to least efficient. The results showed historic, rural, and small-scale hotels were less efficient than were newer, city center, and larger-scale hotels, respectively. Barros stated DEA was more cost effective than were operational audits and that DEA helped identify “strategically important hotels” (p. 472). A DEA weakness in this study was its inability to identify the factors that contributed to inefficient operations. The sample was not homogeneous and the study could have been strengthened with inputs and outputs that considered external factors. Larger lodging units, different geographic regions, and the use of additional model inputs and outputs should be considered in future studies.
Sun and Lu (2005) studied 55 Taiwanese hotels using DEA to measure catering, occupancy, and management efficiency. Sun and Lu extended previous DEA research using a slack-based measure to determine relative performance. The slack-based approach was designed “to find the maximum virtual profit,” unlike other models, which were designed “to find the maximum ratio of virtual output over virtual input” (p. 496). A ranking was presented based on managerial, occupancy, and catering efficiency. The results showed proximity to the airport, number of employees, and availability of catering space were related to managerial efficiency. As was the case with most DEA studies, numerous outputs, including customer satisfaction and quality of service were not accounted for in the model. Again, the results only provided relative efficiency between the hotels studied but not necessarily an efficient solution.

C. F. Chen (2007) studied 55 Taiwanese hotels using a stochastic cost frontier function to measure cost efficiencies. C. F. Chen stated the stochastic methodology, unlike DEA, was able to “isolate the influence of factors other than inefficient behavior” (p. 702). Labor price, food and beverage price, and price of materials were used as inputs. Total room revenue was the single output variable and additional control variables were included in the model. Estimated efficiencies were reported for all properties. Chain hotels were found to be closer to the efficient frontier than were independent hotels. Location and hotel size differences were not statistically significant. This study provided an alternate model to DEA that could be further investigated using a broader sample with additional inputs and outputs.

Sanjeev (2007) applied DEA to 68 India-based hotel and restaurant companies using a unique approach for inputs and outputs. Rather than following previous research, which used hotel unit-level inputs and outputs, Sanjeev used company-wide financial inputs and
outputs. Capital employed, gross fixed assets, current assets, and operating costs were model inputs. Outputs were operating income and profit before depreciation, interest, and taxes. The results included a ranking of all companies based on DEA efficiency. Although two of the outputs, operating income and taxes, were highly related, this study provided an interesting application of DEA using financial inputs and outputs. A refinement of the financial inputs and outputs applied to an international lodging sample is a promising area for future research.

Jones and Siag (2009) cited weaknesses in DEA, stating actual productivity performance is not measured and only relative performance is determined by DEA. Jones and Siag studied 45 U.K.-based hotels over a one-year period to understand which factors affected performance. Using the industry’s widely accepted measure of rooms cleaned per hours worked, the authors reported no statistically significant difference in productivity based on hotel location, size, age, or variability in demand. These findings contradicted Hu and Chai (2004) and Sigala (2004). Though limited in scope, the DEA model inputs and outputs were relevant to industry practitioners.

T. H. Chen (2009) applied DEA to rank seven Asian resort hotels based on efficiency. Using a common weights approach for inputs and outputs, the study narrowed the initial results to a smaller set of efficient hotels that were described as “strategically important hotels” (p. 419). The common weights approach provided a better comparison of hotel properties. The sample was relatively small and the use of only two inputs and two outputs limited T. H. Chen’s findings.

DEA has been extensively studied in lodging. While intuitively appealing, DEA does not provide a measure of which input factors improve efficiency. DEA is used to determine
an efficient horizon and rank the relative efficiency of lodging operations. The use of a limited number of inputs and outputs, its inability to easily isolate which inputs are most relevant, the use of high-level inputs such as headcount, and DEA’s ability to define only relative efficiency relegate DEA to an academic exercise that has not been adopted by practitioners. Sanjeev (2007) offered a promising approach to applying DEA to hospitality companies. Sanjeev used financial statement inputs and outputs to determine relative efficiencies at Indian lodging operations. This approach could be applied to international hotel companies using a more robust set of financial inputs and outputs to determine relative efficiencies, and would be of interest to lodging industry managers, lenders, and investors.

**Human Resource**

The people-intensive nature of lodging industry services makes human resource performance measurement an important activity. The impact of employee behavior on customer satisfaction and brand value is significant, but difficult to measure. Employee payroll and related benefit costs average 35% of total lodging unit costs (PKF Consulting, 2005). Recent lodging research has concentrated on measuring employee turnover and related costs.

Tracey and Hinkin (2006) studied employee turnover to better understand the underlying component costs of turnover and how they differ across various types of hotel properties. Turnover costs were segmented into hard, soft, and opportunity cost categories. Five major types of turnover costs were identified. These were pre-departure, recruitment, selection, orientation and training, and lost productivity costs. The results indicated that selection costs were higher for jobs with low complexity versus high complexity. Tracey and Hinkin found no statistical differences between independent and chain hotels, or between
high and low occupancy hotel turnover costs. Significantly higher pre-departure, recruiting, and orientation costs in hotel properties with low average daily rates (ADRs) were reported. Selection and total turnover costs were greater in high ADR properties. Tracey and Hinkin concluded that the highest turnover costs are in complex jobs in higher ADR hotels located in higher cost-of-living areas. Correcting for missing data and applying a consistent testing approach for turnover costs would have improved the validity of the results. Further, using the number of rooms available was not a good proxy for complexity. Business mix, number of food and beverage outlets, and quality of guest services often impact complexity more than additional available rooms. Hinkin and Tracey subsequently studied 12 hotels and identified average costs for each category of turnover. The categories included pre-departure, recruiting, selection, orientation and training, and productivity loss. Productivity loss was the highest and pre-departure was the lowest reported turnover cost.

Cho, Woods, Jang, and Erdem (2006) surveyed 78 hotel and restaurant company human resource managers to understand the relationship between human resource practices and company performance. Twelve human resource practices were measured on a five-point scale and company performance was measured using turnover, labor productivity, and return on assets (ROA). The regression results showed only the turnover rate of non-managerial employees had a statistically significant relationship with organization performance. Incentive plans were positively related to increased sales and earnings and to lower non-managerial employee turnover. Turnover was lower in companies that adopted pre-employment tests. Surprisingly, companies that adopted grievance procedures and internal recruiting methods experienced higher turnover. A weakness of Cho et al. was using revenue per employee as a labor productivity measure. High room rate markets will experience
higher revenue per employee even though employees may not be as productive in terms of
outputs, as measured by rooms cleaned or other activity-based measures. A future
longitudinal study could investigate the long-term impact of human resource practices on
performance.

Warech and Tracey (2004) reviewed Watson Wyatt Worldwide’s approach to
measuring the value of the human resource function. Watson Wyatt, a global consulting
firm, developed the Human Capital Index (HCI) to measure the impact of human practices on
market value. Surveys of European and North American hotel companies resulted in
estimates of various human resource practices on market value. Although human resource
practices impact financial performance and market value, the positive effects reported in the
study are suspect. By way of example, the research suggested that easy employee access to
technology for communications added 4.2%, and providing flexible work arrangements
added 3.5% to market value. Human resource activities are an important investment that add
value, but the results reported by Warech and Tracey suggest very high returns that may not
be related to improved communications technology and flexible scheduling.

Measuring human resource activities in lodging is an important area for additional
research. Potential performance measurement areas include understanding the effect of
human resource communication efforts, training, and incentive compensation on
productivity. An area that is highly measured by industry practitioners is reservations
productivity. The relationship between reservation center talk-time, closing ratios, and other
reservations performance measures and revenue or room nights booked requires additional
investigation. The people-intensive nature of the hospitality industry suggests additional
investigation is necessary to better understand which management actions lead to a
productive and cost-effective workforce that delights customers. Future research could investigate the linkage between best human resource practices and customer satisfaction. Additional research could explore lodging organizations where lodging employees are members of collective bargaining units to measure how job satisfaction, turnover, and productivity compare to nonunion facilities. Potential future research areas include improving human resource measurement methods related to turnover, training effectiveness, productivity, and the influence of employees on guest service and satisfaction.

**Guest Service/Satisfaction**

Measuring guest satisfaction and service quality is critical to improving service delivery and increasing customer loyalty in the lodging industry. Recent studies (Ting-Kwong Luk & Layton, 2004; Yilmaz, 2009) concentrated on measuring service quality whereas Schall (2003) focused on improving the validity of guest surveys. Schall examined guest survey methods used by hotel practitioners to assess guest attitudes and identified sample, scaling, unidimensionality, and other survey-related issues that might invalidate guest survey results. The time lag between completing on-site, versus e-mailed or mailed guest satisfaction surveys impacts how guests measured satisfaction. Although no empirical evidence was presented, Schall’s research provided valuable information for practitioners who are designing, administering, and relying on guest surveys to measure guest perceptions of lodging experiences.

Fallon and Schofield (2000) surveyed managers, service staff, and customers in three full-service Manchester, U.K. restaurants to measure service quality perceptions and understand perceived quality gaps using the five SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The findings showed managers and
service staff rate quality more highly than do customers. Service staff quality perceptions were more closely associated with customers than manager perceptions. Results for reliability were different and statistically significant for managers and customers, which may be due to the front-line contact of servers with customers. Burns, Graefe, and Absher (2003) studied customer satisfaction scores and the gap between satisfaction and importance levels at 10 water-based recreation facilities. The study used four domains: facilities, services, information, and recreation experience. The results showed satisfaction-only measures were statistically better than were gap scores. Ting-Kwong Luk and Layton (2004) studied room service quality using a convenient guest sample to understand the limitations of the SERVQUAL scale. The findings were consistent with Burns et al. and showed customers judge the actual food and beverage product served as well as the server’s manner, commitment, and knowledge to evaluate room service quality. Ting-Kwong Luk and Layton concluded that performance scores provided a more valid performance measure than did gap scores, because room service customers may not have adequate experience to establish expectations. The authors stated that choosing the proper performance measure is critical to identifying areas for improvement.

Lynn (2003) administered unbounded write-in and a semantic differential scale surveys to customers exiting four restaurants to assess whether the different instruments would support a weak relationship between service quality and tip amounts. The results supported a weak relationship between customer perceptions of service quality and tips.

Gomes, Yasin, and Lisboa (2007) used a service operational effectiveness (SOE) approach to propose a method for measuring effective performance in hospitality service organizations. The authors indicated operational systems included a “front-stage,” which
dealt with customer-facing activities, and a “back-stage,” which included non-customer-facing activities (p. 561). The proposed SOE approach emphasized availability, quality, and efficiency indicators. The SOE was defined as:

\[
\text{SOE} = \text{service availability} \times \text{service quality} \times \text{service efficiency.}
\]

A framework for implementation included initialization, resource identification, process improvement, monitoring and evaluation, and organizational change stages. The authors indicated the “mathematical development” of indicators was too detailed to include in the article and was excluded partly due to “readership interest” (p. 565). Gomes et al.’s research would have been improved by providing specific examples of how the SOE formula could be applied and by including the mathematical model in their research.

H.-S. Kim, Joung, Yuan, Wu, and Chen (2009) developed a service quality measurement instrument based on DINESERV. The instrument was tested on a sample of over 500 U.S.- and Taiwan-based customers for reliability and validity. The authors reported service quality positively impacted customer satisfaction, which resulted in positive word-of-mouth restaurant recommendations.

Yilmaz (2009) surveyed 234 customers in 25 three-, four-, and five-star Turkish hotels to measure quality performance. Yilmaz used the SERVPERF measurement scale, which is performance-based, not gap-based, to understand the relative importance of tangibles, empathy, reliability, and assurance-responsiveness factors to customer perceptions of service quality. The results showed empathy, followed by reliability, assurance-responsiveness, and tangibles, were most important in predicting hotel customer perceptions of quality.
As competition increases, lodging unit financial success becomes more dependent on serving, satisfying, and retaining customers. Using improved measurement techniques to understand guest services and guest satisfaction is one of the most important areas where researchers can contribute to lodging industry practitioners.

**Other Performance Measurement Research**

Recent lodging performance measurement research has concentrated on BSC, DEA, finance, human resource, and guest service/satisfaction areas. Technology and other performance measurement areas have been explored on a more limited basis.

Chung and Law (2003) administered a two-stage questionnaire with Hong Kong-based hotel managers to measure the performance of hotel websites. Performance was measured using website content related to facilities, contact information, reservations information, area information, and website management. Eighty websites were measured using combined weighted-average scores for five performance areas. The results showed higher-priced hotels received higher performance scores. Future research could use customer surveys to measure website performance. Chung and Law’s research is of value to practitioners and could be expanded to measure hotel company websites and other travel provider websites.

Parkan (2005) compared two hotels in a major city to benchmark operating performance using operational competitiveness rating (OCRA). Hotel performance for two properties was compared to city standards to understand the best monthly performance for each property. Operational degrees of relative importance were developed with data from six cost and five revenue categories. Data were evaluated over a 13-month period using a highly complex mathematical model that determined relative input (cost) efficiency ratings, output
(revenue) ratings, and overall efficiency performance ratings. Room expenses relative to room sales was the most important cost category, followed by expenses related to food and beverage sales. Parkan introduced OCRA as a new method of measuring and benchmarking hotel performance. The calculations were complex and few, if any, industry managers would easily be able to digest the underlying methodology. The complexity of this research may limit its value, but further research with a larger sample and additional input and output variables may be of interest to academicians. To reach a broad industry audience, an OCRA computer-based tool could be developed to facilitate adoption by practitioners.

Hakanir and Harris (2005) completed an exploratory case study to document performance measures employed at a five-star hotel. Documentation, observation, and interviews with employees at all organization levels revealed six themes: business dynamics, overall performance, employee performance, customer satisfaction, financial performance, and innovative activity measures. There was a significant amount of overlap across the six categories. The authors concluded “the study yielded valuable information about the decision-making system and the operations” (p. 48). This conclusion was not fully supported by the research.

Yoo and Chon (2008) developed a measurement scale for understanding the factors that affect convention attendance. The authors developed an initial instrument that was subsequently enhanced through interviews, pretesting, and pilot testing. Destination stimuli, networking opportunities, educational opportunities, safety and health situation, and travelability were the five dimensions in the final instrument. Further enhancements and the application of the measurement scale in convention markets would improve industry understanding of the factors that influence convention attendance.
Bergin-Seers and Jago (2007) studied seven small Australian hotels to determine performance measures used to operate successful hotels. An expert panel and in-depth interviews with seven hotel owners were used to understand the financial and nonfinancial measures employed by practitioners. Increasing rooms, building the business, and maintaining the business were identified as three strategies that related to performance measures. The results provided a detailed list of specific measures used at participating lodging units. Interestingly, successful hotel operators determined management activities and measurement systems without using an activity-based or theoretical approach. Performance measures were selected by owners and managers intrinsically or by trial. The performance measurement selection method should be explored with a larger sample to better understand how successful owners and operators choose metrics to evaluate and manage hotels.

Montoro-Sánchez, Mas-Verdu, and Soriano (2008) surveyed 78 small and medium-sized Spanish hotel general managers and owners to understand factors affecting success and productivity. The results showed hotels with owners/managers over 45 years of age who had postgraduate educations and no entrepreneurial family history experienced higher minimum cost output. Hotels with human resource departments, major family financial support, and higher technology proficiency also experienced higher minimum cost output.

RevPASH is a restaurant performance measure of revenue per available seat-hour. Thompson and Sohn (2009) presented examples of calculating true, check-open time, and entire check time variations of RevPASH. Weekday lunch period data for a 118-seat restaurant was used to test RevPASH accuracy. Party size, day of week, and other factors were examined using open and entire time data. The regression results showed the entire
time RevPASH measurement method, which used the period from check open to check close, was more accurate than was the open time method, which considered revenue at the time the check was opened.

Raab, Mayer, Kim, and Shoemaker (2009) demonstrated how price-sensitive measurement can be used in a restaurant to understand customer price sensitivity and determine an optimal and indifference price point. A high price may signal quality, whereas a relatively lower price might communicate value. Dinner customers at a 200-seat buffet in Hong Kong were surveyed to understand at what price point a dinner was too inexpensive, too inexpensive and quality was questioned, too expensive, too expensive and would not be acquired, and where additional customers would be attracted. The study showed how the price-sensitive measure (PSM) technique could be applied to a restaurant, but the study did not consider survey respondents’ loyalty levels.

Wadongo, Edwin, and Oscar (2010) surveyed managers in six, 5-star Kenyan hotels to explore the relationships between various manager types and performance measurements. Manager types included analyzers, motivators, and taskmasters. Determinant measures included quality of service, flexibility, resource innovation, supplier performance, and environmental perspective. Result measures were competitiveness and financial performance. Regression results showed analyzers had the strongest relationship with both determinant and result measures. Motivators were also positively related to determinant and result measures. Taskmasters were strongly associated with utilizing resources, increasing service quality, and innovation.

Performance measurement research has not identified a consensus single or set of measures to understand the total performance of a lodging unit or company. BSC research
has suggested the most holistic approach to performance measurement, but no single measure has yet been put forward to best understand the performance of a lodging unit or company.

Is EVA Momentum a single best measure? Understanding EVA and EVA-related research is essential to understanding EVA Momentum and addressing the importance of EVA Momentum as a performance measurement.

**Economic Value Added**

Although there has been a significant amount of research related to performance measurement, EVA has received very little attention in the lodging industry. This section explores a broad range of EVA-related research areas. EVA-related research threads include EVA framework, EVA and traditional measures, EVA adopters and nonadopters, EVA and the hospitality industry, EVA as a predictive measure, and EVA Momentum. No empirically based EVA Momentum studies have been published in any industry. Table A2 summarizes major EVA-related research since inception.

**Framework**

A significant body of EVA-related research not related to the lodging industry has been published since EVA was introduced as a measurement tool. An even greater body of research exists related to other financial performance measures. The most commonly used finance-based performance measures have been widely adopted by companies and their stakeholders. Brigham (1977) cited return on equity, return on total assets, profit margin, inventory and asset turnover ratios, current and quick ratios, times interest earned, return on invested capital, and price-earnings ratios as financial measurement tools. Keown, Martin, Petty, and Scott (2008) showed days sales outstanding, debt ratio, and return on equity as financial measurement tools. Each of these financial measures provides valuable
information, but no single measure captures all of the critical information included in the balance sheet, income statement, statement of cash flows, or nonfinancial performance measurement areas.

EVA attempts to address the need for a comprehensive performance measurement tool by extending the concept of residual income. Magni (2009) reviewed the history of residual income, which can be traced to the 19th century. Residual income is linked to income and opportunity cost. Opportunity cost is the income an investor would have earned by rejecting the project under consideration. Forker and Powell (2008) described residual income as the measurement of income in excess of the opportunity cost of equity capital invested by shareholders. Stewart (1991) presented EVA’s theoretical underpinnings, calculation techniques, and examples in his seminal work, *The Quest for Value*. Stewart’s (1991) EVA included the adjusted income and capital charge elements found in residual income. Stern Stewart & Co. trademarked EVA and Stewart (1991) described it as a measure that encompassed all elements of the income statement and balance sheet.

Imagine attending a baseball game and measuring earned run average, walks, strikes, and errors, but not knowing the score. EVA was intended to provide a single measure that captured the economic output of numerous activities and determined the amount of value created by a firm in excess of the return required by the firm’s debt and equity holders. EVA is calculated as:

\[
EVA = NOPAT - K \times C,
\]

where NOPAT is net operating profit after taxes, \( K \) is the total capital deployed, and \( C \) is the weighted average cost of capital (WACC). The formula can be expanded to show the individual components of debt and equity utilized by the firm such that:
EVA = NOPAT – \( C_D \times D – C_E \times E \),

where \( C_D \) is the cost of debt, \( D \) is the firm’s interest bearing debt, \( C_E \) is the expected return on equity, and \( E \) is the total equity employed by the firm. The EVA calculation is intuitively appealing. EVA provides a measure of the excess or deficit of a firm’s economic performance relative to the return required by the firm’s external stakeholders, the debt and equity investors.

EVA’s introduction by Stewart (1991) was followed by Tully’s (1993) high-profile *Fortune* magazine cover story which introduced EVA and Stern Stewart & Company’s EVA consulting practice to a national audience. Stewart (1995) described the cultural changes and five common mistakes that should be avoided when implementing EVA. These mistakes included companies not committing to making EVA a way of life, attempting to implement EVA too quickly, the CEO not championing EVA, not providing adequate EVA training, and managers losing focus by concentrating on value creation philosophical issues.

Students and researchers should be cautious when reviewing the proliferation of articles relating to EVA. Garvey and Milbourn (2000) described the competition between consulting firms to promote various performance measures. These included Stern Stewart (EVA), Holt’s cash flow return on investment (CFROI), BCG (Total Business Return), McKinsey (Economic Profit), and LEK/Alcar (Shareholder Value Added). Dillon and Owers (1997) described the development of EVA and warned that much of the early literature relating to EVA was put forth by EVA originators and consultants promoting EVA services.

**EVA and Traditional Performance Measures**

Researchers have addressed the strengths and weaknesses of traditional financial measures and EVA. Nichols (1998) suggested financial stakeholders require returns, not
profits. Nichols investigated the impact on company success of three investment measurement systems. These were CFROI, cash value added (CVA) and EVA. CFROI compared the internal rate of return (IRR) of cash flows to the WACC. CVA, developed by Weissenrieder Consulting AB, required the calculation of operating cash flow demand, which is used in determining the present value of inflated cash flows.

McIntyre (1999) provided examples to show how different depreciation methods can influence EVA and ROA calculations. The treatment of asset capitalization, research and development, training, and advertising were accounting treatments that should be carefully considered when calculating EVA. The author also presented examples of investments with level, decreasing, and increasing future cash flows. McIntyre suggested using multiple measures to evaluate performance.

Johnson (2001) discussed various economic models including CFROI. The major disadvantage of economic earnings models is they are not forward looking. Johnson studied 20 leasing companies to determine the relationship between accounting and economic value and found they were not related.

Pohlen and Colman (2005) presented a framework that measured performance across firms and divisions involved in company supply chains. The activity-based costing (ABC) and dyadic EVA analysis facilitated the alignment of interests and performance measurement in supply chain organizations. The five-step model included establishing strategic objectives, supply chain mapping, using dyadic EVA analysis to evaluate decisions, using ABC to identify costs and performance, and expanding analysis to provide a “dyadic upstream and downstream view” of the supply chain (p. 54). Pohlen and Colman’s model would require a
significant investment to implement across the entire supply chain. Evidence showing EVA is a superior financial measure was not conclusive.

**EVA Adjustments**

One of the challenges in calculating EVA is the number and nature of adjustments required to arrive at NOPAT and capital employed. Stern, Stewart, and Chew (1996) made a case for using EVA in the context of leveraged buyouts (LBOs). The authors cited the LBOs of Safeway, RJR Nabisco, and others to present the case for EVA adoption. Stern et al. specifically pointed out that up to 120 measurement adjustments could be made to accounting income to arrive at NOPAT, but only 15-25 adjustments were generally required. Criteria for adjustments were defined in a four-part test: adjustments must have a material impact on EVA, the outcome could be influenced by managers, operating managers should understand the adjustments, and the adjustments were easy to monitor. Young (1999) defined the major adjustments necessary to transform accounting GAAP-based information to NOPAT. Young cited over 150 potential EVA adjustments and described the rationale for the most common adjustments. These included adjustments for nonrecurring gains and losses, research and development, deferred taxes, provisions for warranties and bad debts, goodwill, depreciation, operating leases, and last in, first out (LIFO) reserves. Sequeria (2000) specifically identified the challenges of converting GAAP income to economic income by showing an example of training expense adjustments. Wachowicz and Shrieves (2001) showed how the present value of economic profit derived from EVA is equivalent to the present value of free cash flow (FCF) and explained the investment, LIFO, research and development capitalization, and depreciation adjustments necessary to determine economic profit.
Weaver (2001) surveyed 29 EVA adopters to understand the differences between EVA theory and industry practice. Weaver reported the most common rationale for implementing EVA were financial management, compensation metrics, and understanding how EVA was related to stock price, cash flow, and net present value. Respondents ranked net income or EPS (earnings per share), operating income, sales growth rate, revenue, and stock appreciation as metrics that were more important than EVA. The results showed that, on average, companies made 19 adjustments to arrive at NOPAT and invested capital amounts. Stewart (1991) recommended the elimination of non-interest-bearing current liabilities (NIBCLs) to arrive at capital. Approximately 60% of Weaver’s respondents eliminated NIBCLs in arriving at capital deployed. All respondents used the capital asset pricing model (CAPM) to determine the cost of equity. CAPM is the methodology used in the Stern Stewart and evaDimension databases. Table A3 provides a summary reconciliation of GAAP and EVA adjustments on a dollar and per share basis for Starwood Hotels and Resorts Worldwide, Inc. for the years ended 2005–2008. Table A4 provides an example of EVA adjustments to determine NOPAT for Starwood from 2005–2008.

Johnson (2001) presented a detailed analysis of the methodology used to convert accounting income to economic income (NOPAT) and accounting owner’s equity to economic investment (capital). Equity analysts and investors use GAAP-based financial statements as an important input to build buy/sell equity recommendation models. There has been a great deal of study, but no consensus that EVA is related to future performance. Understanding the adjustment differences between the Stern Stewart database and GAAP capital employed amounts may help explain why EVA has not been consistently recognized as a predictor of future stock performance. This lack of consensus may be explained by
adjustments to GAAP financial statements when calculating NOPAT and capital amounts. If investors’ and financial analysts’ forecasts are based on GAAP-based information that is significantly different from EVA, then predicting financial returns using EVA metrics may not be valid.

**EVA Adopters and Nonadopters**

Additional research has explored the performance of EVA adopters and nonadopters. Dodd and Johns (1999) surveyed 88 U.S.-based companies to determine differences between EVA adopters and companies that did not use EVA by measuring effectiveness, efficiency, and adaptability. Citing potential cultural changes in EVA companies, Dodd and Johns found that EVA adopters de-emphasized effectiveness, efficiency, and adaptability measures and warned that customer satisfaction measures should be maintained in EVA companies.

Lovata and Costigan (2002) compared 115 EVA adopters to 1,271 nonadopters to understand the characteristics of firms that used EVA and how these firms structured compensation plans. Firms were categorized as defender or prospector firms. Defender firms invested less on new product research and development, relied more on financial measurement tools, focused more on efficiency improvement, and placed less emphasis on customer satisfaction than prospector firms. Defender firms were found to be more likely to use EVA as a measurement tool. Interestingly, firms with a greater percentage of institutional ownership and lower insider ownership were more likely to use EVA.

Wallace (1997) found managers in firms that adopted EVA incentive plans increased asset turnover and asset dispositions, implemented share repurchase programs, and generated higher residual income. EVA was shown to be an effective incentive tool to increase earnings relative to capital deployed.
Abdeen and Haight (2002) compared companies in the Fortune 500 that used EVA to companies that did not use EVA to determine if EVA adopters achieved superior performance. At the time of the study only 9.4% of the Fortune 500 companies had adopted EVA. Abdeen and Haight found that EVA adopters performed better than did non-EVA companies in almost all financial metrics from 1997–1998, although from 1988–1998 non-EVA adopting companies’ mean returns to owners exceeded EVA companies. This performance difference may be partly attributed to late adopters, as EVA was more broadly implemented from 1995–1998.

Griffith (2004) used an event study to measure if EVA adopters experienced abnormal returns versus nonadopters. Griffith (2004) compared 69 Stern Stewart & Company (SSC) EVA compensation system users with 2,561 Russell Index companies not using the SSC system in 2002. The results indicated EVA adopters underperformed other firms. The study also explored whether analysts should use EVA when forecasting equity performance. The evidence did not support using EVA to forecast market performance. The results may reflect underperforming firms adopted EVA at a higher rate than did market or over performing firms due to the former’s need to improve performance.

Hogan and Lewis (2005) studied 108 companies’ data from 1983–1996 to understand operating performance, investments, and shareholder value in firms that adopt economic profit plans. The study compared anticipated adopters, surprise adopters, anticipated nonadopters, and surprise nonadopters. The results showed significant operating and market value improvements following adoption of an economic profit plan. Hogan and Lewis reported, however, that operating performance between adopters and nonadopters was not significantly different. The evidence supporting the adoption of EVA to improve
performance was not conclusive. One research challenge has been determining which companies use EVA. Ghani, Tezel, Ragan, and Stagliano (2005) reported that 269 firms publicly disclosed the use of EVA. Ghani et al. showed EVA was used across different industries and adoption was increasing in service firms with lower fixed asset-based balance sheets. Seventy-five percent of the sample companies used EVA as an incentive compensation performance measure. Approximately 85% of firms that adopted EVA-based incentive plans did not incorporate traditional financial measures in their incentive performance measures. Increased EVA adoption and knowledge of said adoption will provide potentially larger samples for future studies.

**EVA and Human Resources**

EVA was not originally developed as a predictive tool but instead was a method to incent managers to create shareholder value to meet and exceed return hurdles based on capital employed. One of EVA’s advantages is it can be used as a performance measure at both the division and company levels. Research has concentrated on whether companies incenting managers with EVA systems outperformed other companies. Riceman, Cahan, and Lal (2002) studied 52 managers with EVA-related bonus schemes and 65 managers with accounting-based bonus schemes to understand if EVA-incented managers performed better than did managers rewarded by traditional accounting-based incentive plans. Riceman et al. found that EVA-incented managers outperformed managers on traditional incentive schemes, provided the EVA managers understood EVA concepts. The authors found that performance improvements were related to the consistent application of an awards scheme and not specifically tied to EVA-based incentive plans. Riceman et al. also reported that, without
regard to years of service, EVA-incented managers with a high understanding of EVA showed better performance.

Pfeiffer and Schneider (2007) argued that WACC can be used with residual income-based compensation plans provided the asset base is adjusted. Pfeiffer and Schneider stated EVA is not constrained by GAAP, and adjustments to GAAP amounts result in better performance measurement. This approach is consistent with Stewart (1991). Alternatively, Pfeiffer and Schneider argued if the asset base is not adjusted then a capital charge that is higher than the firm cost of capital must be used in investment decision-making and incentive plans.

Athanassakos (2007) surveyed 288 CEOs at Canada’s largest market capitalization companies to determine the level of adoption of value-based management (VBM) analytical tools. Discounted cash flow (DCF) was used by all respondents, and cash flow return on investment, return on invested capital, and EVA were adopted by 61%, 89%, and 35%, respectively, of the companies. Ryan and Trahan (as cited in Athanassakos, 2007) found 50% EVA adoption in the United States at the division level compared to Athanassakos’s survey of 35% in Canada. Corporate adoption was higher in both countries. Athanassakos reported that younger, higher-educated executives were adopters of VBM methods. Murphy (2007) reviewed human resource literature and developed a framework to understand how to measure the EVA of a human resource high performance work system. The evidence did not consistently support EVA-based incentive plans being superior to other incentive plans.

**EVA and the Hospitality Industry**

EVA research in the hospitality industry is limited. Kefgen and Mahoney (1996) reported one of the early applications of EVA to incentive compensation plans in the
hospitality industry. The authors presented a simple case study demonstrating EVA calculations at Walt Disney Company. Ganchev (2000) reviewed various methodologies to measure value drivers and determine the value of a hotel asset. The four-step methodology involved developing the forecast, determining the appropriate time horizon, estimating value drivers and reversion, and discounting the cash flow. Ganchev used EBITDA and the furniture, fixture, and equipment reserve to adapt EVA to the hotel industry.

H. Kim, Gu, and Mattila (2002) decomposed 19 REIT betas from 1993–1999 to determine beta determinants and investigate how systemic and unsystemic risk were impacted by REIT growth and the fixed asset nature of hotel REITs. H. Kim et al. (2002) reported a positive relationship between debt ratio and beta, and suggested REITs using less debt experienced lower systemic risk. W. G. Kim (2006) studied 66 hotel and 23 restaurant companies to determine the relationship between company market values and EVA. W. G. Kim found that EVA was not superior to other traditional accounting measures in understanding or explaining the market value of a hotel or restaurant. The author indicated market value is a forward looking estimation, whereas EVA is a historic performance measure.

Jung (2007) extended the concept of EVA to operating units and senior management in the hospitality industry. Jung presented a framework and methodology to determine ROA and WACC and provided an example using results from OSI Restaurant Partners, Inc. Lee and Kim (2009) studied 353 hospitality companies from 1985–2004 to measure and compare six different financial measures and determine their explanatory power on market-adjusted returns. The authors advanced the earlier work of W. G. Kim (2006) by expanding the study’s time frame and by dividing the hospitality companies into hotel, restaurant, and
casino subsets for additional analysis. Lee and Kim measured return on equity, ROA, and cash flow from operations with three EVA-related measures: EVA, refined EVA (REVA), and market value added (MVA). The authors speculated that EVA may not be an accurate measure of firm performance.

Lee and Upneja (2007) used a residual income-based model to compare non-lodging, non-lodging excluding financial, and service industry stocks to lodging stocks to determine if lodging stocks were undervalued. Using a sample data from 1990–1999, the results showed all stock groups were overvalued and that lodging stocks were undervalued relative to other stocks. A comparison to real estate stocks also showed lodging stocks were undervalued. The cause of the reported undervaluation is unknown and additional financial and nonfinancial disclosure was suggested to improve relative lodging valuations.

**EVA as a Predictive Measure**

EVA is measured using adjusted book equity and debt balances to determine capital deployed and adjusted net operating profits after taxes. Gressle (1996) stated EVA “can identify strategic and tactical actions that will significantly increase shareholder value” (p. 30). As EVA gained recognition, substituting market values for book values and the nature and number of adjustments used in deriving EVA spurred subsequent research. MVA is an extension of EVA that measures the excess of a firm’s market value over its book value. MVA is calculated as:

\[ MVA = V - K, \]

where MVA is market value added, V is the market value of the firm’s debt and equity, and K is the capital invested in the firm. A positive MVA indicates a firm has added value. MVA can be reconciled to EVA by summing the discounted future EVA values. Lundholm
(2001) demonstrated that, when carefully applied, the DCF and residual income models yield the same estimates of equity values. Grant (1996) used the 1993 Stern Stewart 1000 database to demonstrate a series of relationships between MVA-to-capital and EVA-to-capital ratios. Grant showed the net present value of EVA was equal to MVA if EVA cash flows were discounted at the WACC.

O’Byrne (1996) reported that EVA better explained market value than earnings, and that changes in EVA and capital over a 5- and 10-year horizon more significantly explained market value changes than earnings. O’Byrne used the Stern Stewart Performance 1000 from 1985–1993 and reported that markets use higher capitalization rates for positive EVA than for firms with negative EVA. This suggests that markets expect negative EVA companies to improve performance.

Although EVA was developed as a performance measurement tool that combined aspects of earnings with returns on invested capital, EVA- and MVA-related research has attempted to determine if EVA or MVA can predict equity security performance. Bacidore et al. (1997) reviewed EVA methodology and introduced REVA as a new metric to measure performance. REVA substituted market value for book equity in the traditional EVA formula. Selecting 600 firms from the Stern Stewart 1000 database and corresponding data from the University of Chicago’s CRSP (Center for Research in Security Prices) database, the authors showed an increase in EVA or REVA corresponded to market capitalization increases. Bacidore et al. also reported that market expectations were based on current period EVA performance. Biddle, Bowen, and Wallace (1999) found that EVA was not more closely associated with market value than were other accounting measures. Kramer and Peters (2001) grouped the Stern Stewart 1000 database from 1978–1996 into 56 industry
groups to determine if EVA is more suited for determining market value in high capital-intensive industries versus other industries. Kramer and Peters found no evidence that EVA was better suited to fixed asset, capital-intensive companies or industries. NOPAT was better related to MVA than to EVA.

De Villiers (1997) developed adjusted EVA (AEVA) as an alternate measure to EVA. AEVA was designed to be substituted for EVA when making financial decisions under inflation. The AEVA calculation required restating assets in current values; determining the proportional mix of current, depreciable and non-depreciable, assets; calculating the necessary accounting returns; and calculating AEVA.

\[
AEVA = NOPAT - a^* \times (\text{current value capital}),
\]

where \(a^*\) is the required accounting return. The author stated AEVA “will provide a better estimate of actual profitability under inflation” (p. 300), but acknowledged additional research with empirical evidence was necessary. No AEVA empirical research has been published to test AEVA or the impact of inflation on decision making. Stewart (1991) stated that when inflation is low, EVA changes are not correlated with inflationary changes. Warr (2005) studied U.S. public stocks from 1974–2002 to understand the effects of inflation on EVA. Inflation might distort EVA because depreciation does not accurately reflect asset depletion in real terms, debt declines as a result of inflation, and historic cost book values are depressed relative to replacement cost values. To adjust for depreciation, debt, and replacement values Warr developed real EVA as a new measurement. Real EVA was defined as:

\[
\text{realEVA}_t = \frac{\text{NOPAT}_t}{(1+p)} + pD_{t-1} - DA_t - (wacc_{real})^* (\text{replacement capital}_{t-1}),
\]
where \( p \) is the rate of inflation, \( pD \) represents the gain resulting from debt depreciation, \( DA \) is the historic expense depreciation adjustment, and replacement capital is the firm capital base after adjusting for replacement costs. The regression results showed a nominal cost of capital of 8.4% versus the real cost of 5.3% and the average nominal EVA of $48.9 million compared to the average real EVA of $76.0 million. Warr extended De Villiers (1997), showing inflation affects EVA calculations. The complexity of the real EVA metric may limit its implementation.

Farsio, Degel, and Degner (2000) sampled Stern Stewart & Company, Standard & Poor’s 500, and Dow Jones Industrial Average stocks to study the relationship between EVA and stock returns. Using total return as the dependent variable, a series of regression models tested returns against current year, prior year, and over a 5-year period. The results did not support EVA as an indicator of stock return performance.

Garvey and Milbourn (2000) studied 6,789 firm years from 1986–1997 to understand the correlation between EVA adoption and stock performance and to estimate the incremental value added by EVA. The authors’ model attempted to understand the value of EVA as a performance measure that demonstrated how stock prices show the signal content of accounting performance-based measures. Garvey and Milbourn tested estimates of the value added by EVA and found the estimates were significant and positive. Rajan (2000) reviewed Garvey and Milbourn and pointed to several research weaknesses. Rajan stated that stock prices were set by the markets based on public information, but internal EVA metrics used for incentive compensation plans were not available to the public. Rajan indicated the Garvey and Milbourn model did not capture all EVA adjustments and that firm level EVA was used in the model but compensation programs might be based on division
level information. Further, the timing between EVA adoption and the value of EVA adoption were not linked, and the results did not state whether EVA adoption was permanent or temporary.

Shimin and Dodd (2001) studied 1,000 companies in the Stern Stewart 1000 and Compustat databases from 1982–1992. The study measured the information content, if any, provided by residual income versus operating income. The authors found that residual income provided significant information not available in operating income. Shimin and Dodd also reported that EVA was not the best valuation measure.

Corderio and Kent (2001) studied 66 EVA adopters for a 1-year period to understand the effectiveness of EVA programs on firm performance. Using industry security analyst estimates as the dependent variable and a proxy for firm performance, the regression results showed no significant relationship between the adoption of EVA and analyst forecasts. The regression model used was:

\[ \text{Security analyst earnings forecast} = \beta_0 + \beta_1 \text{EVA} + \beta_2 \text{Firmsize} + \beta_3 \text{Firmleverage} + \beta_4 \text{pastfiveyearsummaryEPS} + \beta_5 \text{numberofanalystforecasts} + \beta_6 \text{industry-averageEPSperformance} + e. \]

Cordeiro and Kent stated EVA advantages included concentrating on economic results and using the capital charge to account for the interaction between the balance sheet and income statement. Cordeiro and Kent identified aligning the interests between shareholders and managers, incentivizing improved capital allocation, and promoting entrepreneurial behavior as EVA benefits.

Paulo (2002) argued that relating EVA to MVA was not theoretically sound and stated that relating EVA to MVA was problematic when using an efficient market hypothesis.
(EMH) or in a non-EMH world. EVA would be zero under EMH because the cost of capital, by definition, equaled the internal rate of return and EVA would equal zero. In a non-EMH scenario, Paulo argued that actual financial fundamentals do not have a major impact on asset prices. Paulo indicated that if MVA is not derived from EVA, then owners do not benefit from EVA improvements.

Machuga, Pfeiffer, and Verma (2002) studied over 200 firms from 1981–1996 to determine if EVA included incremental information to EPS when predicting future income. The authors found EVA and EPS were highly correlated (.718), and that EVA adjustments provided information that was incremental to cash flow or EPS in predicting future income.

Adserà and Viñolas (2003) demonstrated that the DCF, EVA, and Modigliani and Miller’s MM models were equivalent and yielded the same results when using the same inputs. Adserà and Viñolas proposed a financial and economic value added (FEVA) model that showed the individual economic and financial value drivers that impact market value. The economic drivers were capital invested, current operating EVA, and the franchise factor. The financial drivers were the tax shield from existing debt, growth opportunity tax shield, the present value of bankruptcy costs, growth opportunity of bankruptcy costs, and market value of debt. The authors stated FEVA was valuable when evaluating new start-up companies that initially destroy and, subsequently, create value. The model provided a method to measure the value of the current business and the value of new investments.

Abate et al. (2004) demonstrated the link between net present value (NPV) and EVA. The authors studied the top (wealth creator) and bottom (wealth destroyer) MVA-ranked companies in the Stern Stewart Performance 1000 for the year 2000. MVA- and EVA-to-capital ratios were calculated and the authors found 80% of the top 50 companies had a
positive relationship between EVA-to-capital and MVA-to-capital, whereas 92% of the bottom-ranked 50 companies had negative MVA- and EVA-to-capital ratios. The authors concluded that investors would invest in potential EVA-generating companies with negative EVA versus EVA destroying companies that are currently producing positive EVA.

Yook (2004) studied pre- and post-acquisition EVA results for 75 surviving firms from 1989–1993. Yook (2004) reported EVA and industry-adjusted EVA results under different scenarios and found acquiring firms experienced significantly lower EVA results after acquisitions. Industry-adjusted results were improved, but still lower in the post-acquisition period. Excluding the acquisition premium, the post-acquisition EVA results were positive. The method of payment, stock versus cash, had no effect on the results. While operating results improved in the post-acquisition period, the improvement was more than offset by the incremental capital costs resulting from the acquisition.

Tsuji (2006) studied 567 Tokyo Stock Exchange listed companies’ data from 1982–2002 to understand if EVA was related to corporate value in Japan. Tsuji used WACC amounts from the CAPM and Fama-French model and found that CAPM generated WACC was generally superior in determining valuation. EVA was reported to be positively related to firm value, but cash flow showed a stronger relationship. Tsuji’s results supported Biddle, Bowen, and Wallace (1997), but did not support O’Byrne (1996). Tsuji reported that EVA did not capture the present value of growth opportunities, but the author failed to acknowledge that cash flow has the same weakness.

Griffith (2006) studied Stern Stewart & Co.’s 2004 Annual Ranking database to determine if EVA, MVA, or future growth reliance (FGR) were good indicators of future stock performance. The author defined MVA as the excess of the market value of debt and
equity over the paid-in-capital, retained earnings, and funded debt. Griffith (2006) stated MVA measured “cash in” and “cash out” (p. 75). Stewart (as cited in Griffith, 2006) stated the equity of positive EVA companies should sell at a premium to book value, whereas companies with negative EVA should trade at a discount. The findings showed EVA, MVA, and FGR were not good predictors of future market performance.

Ferguson, Rentzler, and Yu (2006) studied data from 1,000 companies from the Stern Stewart & Co. annual ranking database to determine if companies with high adjusted-MVA or adjusted-EVA experienced abnormal stock returns. The authors analyzed 10 portfolios of 100 companies ranked by adjusted-MVA and adjusted-EVA performance. The authors found that the winning group’s portfolio experienced higher, though not significant, risk-adjusted MVA and EVA returns. Negative risk-adjusted insignificant returns were found for the remaining groups. The authors speculated earnings momentum may be signaled by adjusted MVA. Zaima (2008) used Stern Stewart’s database and Compustat to form company portfolios and determine if EVA and market value (MV) could be used to develop a portfolio trading strategy. The methodology followed Fama and French (as cited in Zaima, 2008). MV represented stock price at year-end times the outstanding shares. Three portfolios with the low, median, and high EVA/MV ratios were compared. The evidence showed that a portfolio with the lowest EVA/MV ratio outperformed the other portfolios. Low EVA/MV firms had higher risk, which required higher returns. The results were mixed as to whether EVA and MVA were predictors of future stock performance.

Although increasing EVA and MVA may increase firm value, research to determine the predictive value of EVA and related measures has not been inconclusive. Consistent with
GAAP financial statements, EVA and MVA measurements suffer from being historic measures that are not forward looking.

**EVA Momentum**

Stewart (2009) advanced earlier EVA work by introducing EVA Momentum as a new measurement tool. Stewart described EVA Momentum as the increase or decrease in economic profit divided by prior period sales. EVA Momentum is calculated as:

\[
\text{EVA Momentum} = \frac{(\text{EVA}_1 - \text{EVA}_0)}{\text{Sales}_0},
\]

where EVA\(_1\) is economic value added in period one, EVA\(_0\) is economic valued added in the prior period, and Sales\(_0\) is revenue for the prior period. Stewart described EVA Momentum as an economic measure that is size and situation neutral, provides trend warnings, and is “market-calibrated” (p. 76). In contrast to Kaplan and Norton (1992), who stated no single measure is adequate to measure business performance, Stewart argued EVA Momentum is the single best performance measurement tool. EVA Momentum attempts to address the weaknesses in sales growth rate, EPS, market share, profit margin, return on capital, and other measures. EVA Momentum considers year-over-year changes in economic profit as measured by EVA, relative to prior year sales. This methodology allows for measurement of the change in a firm’s economic performance relative to the firm’s baseline sales. Stewart (2009) claimed that stating EVA Momentum as a percentage of sales facilitates performance comparisons across company size and industries. Stewart stated EVA Momentum converts EVA into a ratio-based metric, is the only ratio that should always be maximized, replaces other financial ratios with a measure that is better and easier to understand, and serves as a diagnostic tool. No known empirical research has been reported on EVA Momentum in lodging or any other industry.
Hypotheses

Recent lodging performance measurement research (Ganchev, 2000; W. G. Kim, 2006; Lee & Kim, 2009) has investigated EVA, whereas other lodging accounting and finance research (Mongiello & Harris, 2005; Ryu & Jang, 2004) has concentrated on more traditional financial measures. BSC research in lodging is an extension of Kaplan and Norton (1992) and pointed to the use of numerous measurements in evaluating lodging performance. DEA was extensively studied with Sanjeev’s (2007) exploration of one of the most promising industry applications of DEA. Human resource, service, and guest satisfaction measurement research will continue to fine tune the industry performance measurement methods. To date, no lodging industry research has identified a single measure that captures historic economic performance or is related to future lodging unit or company value.

The introduction of EVA (Stewart, 1991) has resulted in conflicting research about EVA’s validity as a performance measure. Various authors (Johnson, 2001; Sequeria, 2000; Stern et al., 1996; Wachowicz & Shreives, 2001; Yook, 1999; Young, 1999) have discussed issues related to the adjustments used in calculating NOPAT and capital for EVA. Equity investors and analysts continue to use GAAP financial statements as an important factor in equity buy/sell decisions and recommendations. Equity analysts and investors rely on GAAP-based financial information when evaluating investments. EVA adjustments to GAAP financial statements that are not visible or known to investors or equity analysts may make EVA less relevant as a predictive measurement tool.

EVA and EVA-related measures have been extensively studied to determine the predictive value of EVA (Abate et al., 2004; Bacidore et al., 1997; Ferguson et al., 2006;
The evidence is not conclusive. Investors and equity market analysts use GAAP-based financial statements as a basis for predictive models. GAAP- and market-based capital, if significantly different from EVA capital, may result in analysts and investors estimating equity values different than those predicted by EVA models. This might explain why EVA and EVA-related measures have not been widely accepted as a good predictor of future company values. Additionally, EVA and EVA Momentum are historic measures, and valuation is a forward-looking exercise.

The purpose of this study was to understand EVA Momentum as a performance measure in the U.S. lodging industry, to examine the relationship between EVA Momentum and future financial performance, and to compare EVA Momentum to traditional financial measures. Five hypotheses were explored.

The lodging and restaurant industries have many common elements. Companies in both industries rely on owned, leased, managed, and franchised property income. Volumes vary across seasons, days of the week, and times of day. Both industries are labor intensive and variable costs can be quickly changed in response to volume changes. Many hotels offer restaurant services. Major hotel and restaurant companies operate under the umbrella of nationally or globally recognized brands. Nonetheless, restaurants are different in that they have commonly been reported to have one of the highest failure rates of any industry. Ernst (2002) reported one third of new restaurants in the United States fail in the first 2 years. Parsa, Self, Njite, and King (2005) studied restaurant bankruptcies and reported a 26% first-year and 60% three-year cumulative failure rate. Researchers have developed models to predict the restaurant failure rate (Gu, 2002; H. Kim & Gu, 2006). EVA and EVA
Momentum are designed to measure returns relative to stakeholder capital employed. The high failure rates for restaurants would suggest that restaurants on average may struggle to produce returns necessary to satisfy debt and equity stakeholders, and EVA Momentum may be lower in the restaurant industry than in other industries. Stewart (2009) stated EVA Momentum can be compared across industries. This suggests that EVA Momentum in two industries with many similar characteristics should be comparable. The first hypothesis explored the difference between lodging and restaurant industry EVA Momentum.

\[ H1: \text{There is no difference between lodging and restaurant company EVA Momentum.} \]

Over the last two decades, REITs have altered the nature of lodging ownership. In 1992 Marriott International spun off its real estate assets and formed Host Marriott, now renamed Host Hotels & Resorts. Host Marriott subsequently converted to a REIT in 1998. These events led to explosive changes in hotel ownership and financing techniques and to a significant increase in the number and scale of public REITs in lodging and other sectors. REITs must own at least 75% of total assets in real property and earn at least 75% of total income in real estate. In spite of the tremendous growth in REITs that specialize in lodging and other asset classes, researchers (Jackson, 2009; H. Kim et al., 2002) found lodging REIT returns underperformed a portfolio of non-lodging REITs. REITs generate earnings through long-term lease or debt contracts, whereas lodging company revenues and earnings are driven by short-term nightly rental, management, and franchise fee income. REITs have high fixed expenses relative to total expenses and, unlike lodging companies, have very little ability to flex expenses during cyclical downturns. The balance sheet and income statement differences between lodging companies and REITs provide a basis for comparing EVA
Momentum in dissimilar industries. Stewart (2009) stated EVA Momentum provides a common measurement that facilitates comparing companies across divisions and across industries. This suggests there should not be significant differences in EVA Momentum between different industries. Do public lodging companies with higher fee-producing capabilities and lower fixed asset bases generate higher EVA Momentum than do firms that are reliant on real estate earnings? The second hypothesis explored whether fee-generating lodging companies have higher EVA Momentum than do fixed asset-intensive REITs.

\[ H2: \text{Lodging companies have higher EVA Momentum than fixed asset-intensive companies.} \]

Stewart (2009) suggested EVA Momentum is an early warning device. Reviews on whether EVA is related to future performance have been mixed, and no study has addressed whether EVA Momentum is related to future performance. Research (Bacidore et al., 1997; Biddle et al., 1999; Farsio et al., 2000; Garvey & Milbourn, 2000; Kramer & Peters, 2001; O’Byrne, 1996; Shimin & Dodd, 2001) has concentrated on whether EVA is related to future changes in stock price or market value. A potential weakness in relating EVA to equity performance may be the focus on the relationship between EVA and stock price or market value. EVA and EVA Momentum consider both debt and equity values and the total cost of capital. Total capitalization may be the more theoretically sound dependent variable. Additionally, comparing the change in EVA to prior period sales may result in a matching issue that adversely impacts EVA Momentum’s relationship to future values. The third and fourth hypotheses explored EVA Momentum’s relationship to both market capitalization and total capitalization.
**H3:** EVA Momentum is related to future financial performance as measured by market capitalization.

**H4:** EVA Momentum is related to future financial performance as measured by total capitalization.

Stewart (2009) described EVA Momentum as the single best performance measure. When developing EVA, Stewart (1991) stated earnings were a misleading corporate performance measure. Lee and Kim (2009) studied EVA, MVA, and refined EVA to determine if these EVA-related measures were superior to other traditional accounting measures. Lee and Kim found MVA and REVA were good performance measures, but EVA and three traditional accounting measures were not good performance measures. The final hypothesis explored whether EVA Momentum was a better measure of future financial performance than were three of the traditional measures studied by Lee and Kim: return on sales (ROS), return on assets (ROA), and earnings per share (EPS).

**H5:** EVA Momentum is more highly related to financial performance than is ROS, ROA, or EPS.

Stewart (2009) reported EVA Momentum is the best new performance measurement tool. The present research investigated EVA Momentum’s value as a performance measure in the lodging industry and is the first known empirical study of EVA Momentum in any industry.
CHAPTER 3. METHODS AND PROCEDURES

The purpose of this study was to understand EVA Momentum as a performance measure in the U.S. lodging industry. This chapter presents the sample and research methods used in this study.

Sample

Secondary lodging, restaurant, and REIT data for the period from 2001–2008 used in this study was obtained from evaDimensions and Compustat. Bennett Stewart’s evaDimensions database is the successor to the Stern Stewart database previously used in numerous EVA-related studies (Abate et al., 2004; Bacidore et al., 1997; Ferguson et al., 2006; Grant, 1996; Griffith, 2006; W. G. Kim, 2006; Kramer & Peters, 2001; Shimon & Dodd, 2001; Zaima, 2008). The evaDimensions database uses GAAP- and other market-based data from Compustat to measure NOPAT, EVA, and EVA Momentum. Additionally, the evaDimensions database includes market capitalization, debt, sales, the cost of capital charge used to derive EVA, and other financial data. The CAPM was used in the evaDimensions database to determine the cost of capital charge. Yook (1999) reviewed the EVA methodology and demonstrated that Stern Stewart’s EVA database could be replicated using Compustat with a high degree of correlation.

The Securities and Exchange Commission classifies businesses by Standard Industrial Classification (SIC) codes. The evaDimensions sample for the study included fiscal year-end financial information for 68 lodging, 56 restaurant, and 127 real estate investment companies with the SIC codes 4400, 5810, 6798, 7011, and 7990. The lodging sample companies from SIC codes 4400, 7011, and 7990 included U.S.-based publicly traded water transportation and cruise ship, hotel and motel, and amusement and recreation service companies,
respectively. SIC code 5810 included retail eating and drinking establishments, and SIC code 6798 included fixed asset- and real estate mortgage-based REITs.

The lodging and restaurant company sample was screened to eliminate companies with incomplete data and to eliminate companies in which lodging and leisure, or restaurant activities were not the primary business. By way of example, SIC code 5810 included horse and motor race track and gaming machine companies, which were eliminated from the sample.

REITs gained popularity as a form of public company real estate ownership over the last decade. REITs invest in real property and fixed asset-related debt instruments and do not pay federal income taxes. The total REIT portfolio in this study was screened to eliminate REITs that invested only in debt securities. The remaining fixed asset-intensive REITs were included in the sample.

The number of publicly-traded lodging REITs was very limited in the 1990s. The total number of public company REITs in the evaDimension database increased from 5 in 1997 to 127 in 2008. The 11 currently publicly traded hotel REITs did not provide a sufficient fixed asset-intensive company sample for testing only lodging REITs. Due to the limited number of REITs in 1997–2000, the period of this study was reduced to 2001–2008 to ensure an adequate REIT sample. The final REIT portfolio was used as a proxy for asset-intensive companies. The pooled lodging, restaurant, and REIT sample was used to test $H1$ and $H2$.

$H3$, $H4$, and $H5$ were tested using additional data that was obtained from Compustat and combined with the sample used to test the first two hypotheses. Additional data used in this study included long-term debt, fixed asset, EBIT, EBITDA, income before extraordinary
items, pretax income, net income, fully diluted earnings per share including and excluding extraordinary items, and other financial measures. The sample was screened to include only companies that had complete data in the sample for each year from 2001–2008.

**Research Design**

EVA Momentum, the independent variable of interest, was obtained from the evaDimensions database and was determined using:

\[
\text{EVA Momentum} = \frac{\text{EVA}_1 - \text{EVA}_0}{\text{Sales}_0}
\]

A two-tailed \(t\)-test for the pooled firm years was used to test \(H_1\), which stated there is no difference between lodging and restaurant company EVA Momentum. The lodging industry entered an economic downturn after the events of September 11, 2001, recovered from 2002–2007, and then again entered a trough in the wake of the 2008 financial crisis. \(T\)-test results for the individual years from 2001-2008 were performed to understand the EVA Momentum differences, if any, between lodging companies and restaurant companies at various points in the business cycle.

\(H_2\) stated that lodging companies have higher EVA Momentum than do fixed asset-intensive companies. REITs, by definition under U.S. tax law, must hold at least 75% of assets in real property. Violation of this rule triggers a loss of REIT status, and the REIT is subject to paying U.S. federal income taxes. These regulations ensure REITs invest heavily in real property or fixed asset debt, making a portfolio of REIT assets, after adjusting for REITs that invest primarily in real estate-related debt, a good proxy for fixed asset-intensive companies. One-way ANOVA for the individual years from 2001–2008 and for the pooled years for the same period was used to test \(H_2\) and determine if lodging companies have higher EVA Momentum than do fixed asset-intensive companies. Results for all years on a
pooled basis and for individual years from 2001–2008 were measured to understand the differences, if any, between lodging companies and asset-intensive companies at various points in the business cycle.

H3 and H4 investigated whether EVA Momentum was related to future value. H3 stated EVA Momentum is related to future financial performance as measured by market capitalization, and H4 stated EVA Momentum is related to future financial performance as measured by total capitalization. Total capitalization was measured as the sum of total market capitalization and long-term debt. Multiple regression analysis, where market capitalization and total capitalization were the independent variables, was used to test H3 and H4, respectively.

Revenue-, income-, market-, leverage-, and firm size-related covariates were used in the H3 and H4 regression models. Analyst reports provide stock recommendations that influence investor decisions and are a driver in determining future values (Barker & Imam, 2008; Bhattacharya, Black, Christensen, & Larson, 2003). Previts, Bricker, and Robinson (1994) examined 479 sell-side analyst reports prepared by 48 brokerage firms for 327 companies to understand what information sell-side analysts use when issuing stock recommendation reports. Previts et al. showed that sales and income were the GAAP financial statement items most heavily used in determining analyst recommendations. Ball and Brown (1968) found the income statement captures one-half of all information that affects share prices. Prior year sales, net income, pretax income, EBIT, income before extraordinary items, fully diluted earnings per share, and earnings per share excluding extraordinary items were used as regression model covariates.
Breton and Taffler (2001) studied analyst recommendations and found market conditions and growth were common themes in analyst recommendations. Lodging, restaurant, and REIT debt costs are based on London Interbank Overnight Rate (LIBOR) or U.S. Treasury rates. The change in gross domestic product and the change in the LIBOR in the prior year were used as independent variables to capture market conditions. The percentage change in prior year sales, net income, and EPS were calculated and used as independent variables to capture growth.

The natural log of assets, sales, and number of employees has been used to define firm size (Singh, 1986). Firm size has been shown to be related to expected return (Berk, 1995). Lee and Kim (2009) used the natural log of sales to measure firm size. The natural log of total assets was used as a control variable in this study.

In their seminal work on capital structure, Modigliani and Miller (1958) developed the foundation of capital structure theory. Modigliani and Miller’s Proposition II stated that shareholder return on equity increased as a firm increased financial leverage. Leverage, an additional explanatory variable, was defined as debt-to-total assets (DeFond & Jiambalvo, 1994; H. Kim et al., 2002; Peasnell, Pope, & Young, 2005).

The initial regression models for $H_3$ and $H_4$ were:

$$H_3: M_1 = \beta_0 + \beta_1 EVAM_0 + \beta_2 FIRMSIZE_0 + \epsilon_0,$$

$$H_4: TC_1 = \beta_0 + \beta_1 EVAM_0 + \beta_2 FIRMSIZE_0 + \epsilon_0,$$

where market capitalization ($M_1$) and total capitalization ($TC_1$) at the end of year 1 were the independent variables. The regression models included EVA Momentum ($EVAM_0$) as the variable of interest and the natural log of prior period total assets ($FIRMSIZE_0$) as an additional independent variable. Pearson correlations were used to measure independent
variable relationships. Stepwise forward selection was utilized to screen independent variables and determine the most efficient regression models. Variance inflation factors were measured to determine potential multicollinearity issues. Final model results were measured using annual results for the pooled firm years that included the lodging, restaurant, and REIT samples, and separately for the lodging sample.

H5 stated EVA Momentum is more highly related to financial performance than are traditional financial measures. Pearson’s correlation coefficients were measured, and market and total capitalization were used as the dependent variables. EVA Momentum (EVAM), return on sales (ROS), return on assets (ROA), earnings per share (EPS), and firm size (FIRMSIZE) were explanatory variables in the model. The annual percentage change in EPS was substituted for EPS as an alternate independent variable. The H5 regression models were:

\[ M_1 = \beta_0 + \beta_1 \text{EVAM}_0 + \beta_2 \text{ROS}_0 + \beta_3 \text{ROA}_0 + \beta_4 \text{EPS}_0 + \beta_5 \text{FIRMSIZE}_0 + \epsilon_0, \]
\[ TC_1 = \beta_0 + \beta_1 \text{EVAM}_0 + \beta_2 \text{ROS}_0 + \beta_3 \text{ROA}_0 + \beta_4 \text{EPS}_0 + \beta_5 \text{FIRMSIZE}_0 + \epsilon_0. \]

Regression analysis was completed for the pooled sample and for the individual lodging, restaurant, and REIT industry samples.

Data Analysis

STATA (version 11.1) was used to prepare descriptive statistics, perform t-tests for H1, one-way ANOVA for H2, and develop the regression models for H3, H4, and H5. Pearson’s correlation matrix was used to understand the relationship between the regression model variables, and variance inflation factors were examined for all models. Alpha was 0.05 for all hypothesis testing.
CHAPTER 4. RESULTS

The research objective of this study was to investigate EVA Momentum as a performance measure in the U.S. lodging industry, compare EVA Momentum across different industries, and understand if EVA Momentum was related to financial performance. Table 1 includes descriptive statistics for the sample used to test $H1$ and $H2$. Descriptive statistics for $H3$, $H4$, and $H5$ are shown in Table 2.

After screening to eliminate companies with incomplete data and companies in which lodging, restaurant, or asset-based REITs were not the primary business, the final sample used to test the first two hypotheses included 257 lodging, 299 restaurant, and 690 REIT firm years for the period from 2001–2008. Table 1 shows EVA Momentum descriptive statistics for the final sample for all firm years on a pooled basis for the 8-year period from 2001–2008. On average, EVA Momentum for restaurants ($M = 0.0046$, $SD = 0.0564$) was higher than for lodging ($M = 0.0023$, $SD = 0.0619$) and REITs ($M = −0.0226$, $SD = 0.4235$) over the 8-year period. The summary statistics for the final sample used for $H3$, $H4$, and $H5$ are shown in Table 2. Pooled EVA Momentum for restaurants ($M = 0.0053$, $SD = 0.0570$) again was higher than for lodging ($M = 0.0027$, $SD = 0.0587$) and REITs ($M = −0.0196$, $SD = 0.3644$) from 2001–2008. Test results for the five hypotheses are described below.

Table 1

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>$M$</th>
<th>$SD$</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodging</td>
<td>257</td>
<td>0.0024</td>
<td>0.0619</td>
<td>[−0.0053, 0.0099]</td>
</tr>
<tr>
<td>Restaurant</td>
<td>299</td>
<td>0.0046</td>
<td>0.0564</td>
<td>[−0.0018, 0.0110]</td>
</tr>
<tr>
<td>REIT</td>
<td>690</td>
<td>−0.0226</td>
<td>0.4235</td>
<td>[−0.0543, −0.0090]</td>
</tr>
<tr>
<td>Pooled</td>
<td>1246</td>
<td>−0.0109</td>
<td>0.3178</td>
<td>[−0.0286, 0.0067]</td>
</tr>
</tbody>
</table>
Table 2

Regression Model Descriptive Statistics for EVA Momentum from 2001-2008

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodging</td>
<td>212</td>
<td>0.0027</td>
<td>0.0587</td>
<td>[-0.0053, 0.0107]</td>
</tr>
<tr>
<td>Restaurant</td>
<td>269</td>
<td>0.0053</td>
<td>0.0570</td>
<td>[-0.0016, 0.0121]</td>
</tr>
<tr>
<td>REIT</td>
<td>592</td>
<td>-0.0196</td>
<td>0.3644</td>
<td>[-0.0490, 0.0099]</td>
</tr>
<tr>
<td>Pooled</td>
<td>1,073</td>
<td>-0.0089</td>
<td>0.2736</td>
<td>[-0.0253, 0.0074]</td>
</tr>
</tbody>
</table>

Hypothesis 1

The evidence in this study supported that on a pooled basis for the period from 2001–2008 there was not a difference between lodging and restaurant industry EVA Momentum. Equality of variances between the groups was assessed using Levene’s test. After determining unequal variances between the lodging and restaurant samples from 2001–2008, the t-tests showed the difference between lodging (M = 0.0024, SD = 0.0619) and restaurant (M = 0.0046, SD = 0.0564) industry EVA Momentum was not statistically significant, t(554) = 0.4458, p = .66 (two-tailed). Additional t-tests for each year from 2001–2008 were performed to determine if the lodging and restaurant industry mean EVA Momentum were statistically different at various points in the business cycle. Annual t-test results comparing lodging and restaurant EVA Momentum are shown in Table 3. Again, the data showed no statistically significant difference between lodging and restaurant EVA Momentum in any individual year from 2001–2008. Figure 1 shows a comparison among the mean pooled and individual-year lodging and restaurant EVA Momentum results from 2001–2008. The lodging and restaurant results were almost identical on a pooled basis over the measurement period, but the individual year results diverged at various points in the business cycle.
Table 3

*Two-Tail t-Test Comparing Lodging and REIT EVA Momentum*

<table>
<thead>
<tr>
<th>Year</th>
<th>Lodging M</th>
<th>Lodging N</th>
<th>Restaurant M</th>
<th>Restaurant N</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>0.0158</td>
<td>30</td>
<td>0.0149</td>
<td>30</td>
<td>-0.04</td>
<td>0.97</td>
</tr>
<tr>
<td>2002</td>
<td>0.0059</td>
<td>31</td>
<td>0.0178</td>
<td>33</td>
<td>0.98</td>
<td>0.33</td>
</tr>
<tr>
<td>2003</td>
<td>0.0094</td>
<td>31</td>
<td>0.0051</td>
<td>33</td>
<td>-0.32</td>
<td>0.75</td>
</tr>
<tr>
<td>2004</td>
<td>0.0000</td>
<td>30</td>
<td>0.0020</td>
<td>37</td>
<td>0.17</td>
<td>0.86</td>
</tr>
<tr>
<td>2005</td>
<td>0.0019</td>
<td>31</td>
<td>0.0086</td>
<td>40</td>
<td>0.51</td>
<td>0.61</td>
</tr>
<tr>
<td>2006</td>
<td>0.0057</td>
<td>32</td>
<td>0.0103</td>
<td>42</td>
<td>0.42</td>
<td>0.68</td>
</tr>
<tr>
<td>2007</td>
<td>-0.0079</td>
<td>34</td>
<td>-0.0091</td>
<td>44</td>
<td>-0.09</td>
<td>0.93</td>
</tr>
<tr>
<td>2008</td>
<td>-0.0085</td>
<td>38</td>
<td>-0.0072</td>
<td>40</td>
<td>0.09</td>
<td>0.93</td>
</tr>
</tbody>
</table>

*Figure 1.* Pooled and individual year lodging and restaurant EVA momentum comparison from 2001-2008.
Lodging EVA Momentum decreased sharply in the year following the events of September 11, 2001, whereas restaurant EVA Momentum slightly increased. This is consistent with the deep drop in business and vacation airline travel that more adversely impacted lodging results relative to restaurants, which are not dependent on air travel. With the exception of the year immediately following September 11, 2001, annual lodging and restaurant EVA Momentum moved within a narrow band from 2002–2008. Lodging and restaurant EVA Momentum declined in a similar fashion in 2007 and stabilized at similar and relatively low levels in 2008. The EVA Momentum decline in 2008 is consistent with the financial crisis. The cause of the decline in EVA Momentum in 2007 is unclear. Bloom (2010) identified 19 public company mergers from 2004–2007. The decrease in lodging EVA Momentum might be related to merger and acquisition activity. The evidence in this study supports using EVA Momentum as a measurement for comparing companies across industries with similar underlying revenue generation and earnings characteristics.

**Hypothesis 2**

*H2* stated that lodging companies have higher EVA Momentum than do fixed asset-intensive companies. Although, on average, lodging industry EVA Momentum was higher than for fixed asset-intensive REITs from 2001–2008, the evidence in this study did not support the hypothesis that lodging was higher than fixed asset-intensive REIT EVA Momentum. One-way ANOVA tests showed lodging EVA Momentum (*M* = 0.0024, *SD* = 0.0619) was greater than REIT EVA Momentum (*M* = –0.0226, *SD* = 0.4235), but the results were not statistically significant, *F*(1, 945) = 0.88, *p* = .35. Additionally, individual year one-way ANOVA analysis in Table 4 show lodging EVA Momentum was greater than that for REITs in 5 of the 8 years studied. The ANOVA results, *F*(1,79) = 4.25,
Table 4

One-way ANOVA Comparing Lodging and REIT EVA Momentum

<table>
<thead>
<tr>
<th>Year</th>
<th>Lodging M</th>
<th>Lodging N</th>
<th>REIT M</th>
<th>REIT N</th>
<th>ANOVA F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>0.0158</td>
<td>30</td>
<td>-0.0526</td>
<td>51</td>
<td>4.25</td>
<td>0.04</td>
</tr>
<tr>
<td>2002</td>
<td>0.0059</td>
<td>31</td>
<td>0.0245</td>
<td>79</td>
<td>0.39</td>
<td>0.53</td>
</tr>
<tr>
<td>2003</td>
<td>0.0094</td>
<td>31</td>
<td>-0.0696</td>
<td>81</td>
<td>0.71</td>
<td>0.40</td>
</tr>
<tr>
<td>2004</td>
<td>0.0000</td>
<td>30</td>
<td>0.0204</td>
<td>90</td>
<td>0.06</td>
<td>0.80</td>
</tr>
<tr>
<td>2005</td>
<td>0.0019</td>
<td>31</td>
<td>-0.0788</td>
<td>95</td>
<td>2.51</td>
<td>0.12</td>
</tr>
<tr>
<td>2006</td>
<td>0.0057</td>
<td>32</td>
<td>-0.0224</td>
<td>97</td>
<td>0.14</td>
<td>0.71</td>
</tr>
<tr>
<td>2007</td>
<td>-0.0079</td>
<td>34</td>
<td>-0.0020</td>
<td>98</td>
<td>0.07</td>
<td>0.79</td>
</tr>
<tr>
<td>2008</td>
<td>-0.0085</td>
<td>38</td>
<td>-0.0339</td>
<td>99</td>
<td>0.12</td>
<td>0.73</td>
</tr>
</tbody>
</table>

*Figure 2.* Pooled and individual year lodging and REIT EVA momentum comparison from 2001–2008.
$p = .04$, supported the null hypothesis only in 2001, and were not statistically significant for the individual years from 2002–2008. Figure 2, which shows a comparison among individual year and pooled mean lodging and REIT EVA Momentum from 2001–2008, illustrates the volatility of REIT performance relative to lodging. This study found, on average, EVA Momentum for lodging was higher than asset-intensive REITs from 2001–2008, but the results were not statistically significant.

**Hypothesis 3**

$H3$ stated EVA Momentum is related to future financial performance as measured by market capitalization. Pearson’s correlations were used to examine the regression model variables. EVA Momentum and market capitalization were not correlated, $r(1,072) = .03, p = .42$. Twenty-five regression models were developed using the pooled data summarized in Table 2 to understand the relationship between EVA Momentum and market capitalization. Stepwise selection was used to determine the independent variables that resulted in the most efficient regression models. Models A–D in Table 5 were the most efficient models as measured by $r^2$, independent variable $t$-tests, model $F$-tests, and variance inflation factors. The $F$-tests were significant ($p < .000$), and $r^2$ was greater than $.78$ for models A–D.

Multicollinearity was tested, and the variance inflation factors for models A–D in Table 5 were below 10, indicating multicollinearity was not an issue. The Bonferroni adjustment for multiple comparisons showed EVA Momentum was not related to market capitalization ($p > .002$). The $p$-level for EVA Momentum in Models A–D was greater than .10 in all models. Based on the evidence in this study, EVA Momentum is not related to future market capitalization.
Table 5

**Pooled Regression Analysis Predicting Market Capitalization from 2001-2008**

<table>
<thead>
<tr>
<th></th>
<th>Model A</th>
<th>Model B</th>
<th>Model C</th>
<th>Model D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>EVA Momentum</td>
<td>0.757</td>
<td>1.944</td>
<td>-0.580</td>
<td>2.100</td>
</tr>
<tr>
<td>Sales</td>
<td>0.513***</td>
<td>0.160</td>
<td>0.453***</td>
<td>0.155</td>
</tr>
<tr>
<td>EBIT</td>
<td>9.247***</td>
<td>1.032</td>
<td>5.628***</td>
<td>1.425</td>
</tr>
<tr>
<td>Firm size</td>
<td>163.131*</td>
<td>89.473</td>
<td>116.231</td>
<td>91.241</td>
</tr>
<tr>
<td>Net income</td>
<td>6.676***</td>
<td>1.932</td>
<td>6.672***</td>
<td>1.934</td>
</tr>
<tr>
<td>EVA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVA^2</td>
<td></td>
<td></td>
<td>-0.004</td>
<td>0.007</td>
</tr>
<tr>
<td>LIBOR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-916.948*</td>
<td>523.149</td>
<td>-599.435</td>
<td>529.185</td>
</tr>
<tr>
<td>Number of observations</td>
<td>1,073</td>
<td>1,073</td>
<td>1,073</td>
<td>1,073</td>
</tr>
<tr>
<td>VIF</td>
<td>2.92</td>
<td>4.26</td>
<td>3.82</td>
<td>3.89</td>
</tr>
<tr>
<td>Adjusted r^2</td>
<td>0.7826</td>
<td>0.8010</td>
<td>0.8008</td>
<td>0.8015</td>
</tr>
<tr>
<td>r^2</td>
<td>0.7834</td>
<td>0.8019</td>
<td>0.8019</td>
<td>0.8026</td>
</tr>
<tr>
<td>F</td>
<td>131.33***</td>
<td>122.79***</td>
<td>102.24***</td>
<td>103.74***</td>
</tr>
<tr>
<td>Root MSE</td>
<td>2,754.410</td>
<td>2,635.439</td>
<td>2,636.581</td>
<td>2,631.753</td>
</tr>
<tr>
<td>Model SS</td>
<td>29,309,087,232.697</td>
<td>30,000,876,750.261</td>
<td>30,001,402,596.307</td>
<td>30,028,519,976.709</td>
</tr>
<tr>
<td>Model df</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Residual SS</td>
<td>8,102,677,979.007</td>
<td>7,410,888,461.443</td>
<td>7,410,362,615.397</td>
<td>7,383,245,234.995</td>
</tr>
<tr>
<td>Residual df</td>
<td>1,068</td>
<td>1,067</td>
<td>1,066</td>
<td>1,066</td>
</tr>
</tbody>
</table>

*p < .1.  ***p < .01.
To further investigate the relationship between EVA Momentum and market capitalization, 25 additional regression models were tested using only lodging data from 2001–2008. Again, EVA Momentum was found to not be related to market capitalization in any model.

**Hypothesis 4**

*H4* stated EVA Momentum is related to future financial performance as measured by total capitalization. Pooled data, summarized in Table 2, from 2001–2008 was used to develop 25 EVA Momentum-related regression models with total capitalization as the dependent variable. Again, Pearson’s correlations were used to examine the regression model variables. EVA Momentum and total capitalization were not correlated, $r(1,072) = .02, p = .62$. Independent variables were screened using stepwise selection. Models E–H in Table 6 provide a summary of the most efficient regression models as measured by $r^2$, independent variable $t$-tests, model $F$-tests, and variance inflation factors. The $F$-tests in models E–H were significant at the .01 level and $r^2$ was greater than .84. Multicollinearity was tested using variance inflation factors (VIF). VIF in models E-H in Table 6 were below 10, indicating multicollinearity was not an issue. The Bonferroni adjustment for multiple comparisons again showed EVA Momentum was not related to total capitalization ($p > .002$). The $p$-level for EVA Momentum in all total capitalization models was greater than .10. Consistent with *H3*, this research found EVA Momentum was not related to future value as measured by total capitalization. Model G was promising in predicting future total capitalization. EBIT and firm size were statistically significant, but EVA Momentum was not related to total capitalization, $\beta = 1.44$, $t(1,067) = 0.54$, $p = .59$. 
Table 6

Pooled Regression Analysis Predicting Total Capitalization from 2001–2008

<table>
<thead>
<tr>
<th></th>
<th>Model E</th>
<th>SE</th>
<th>Model F</th>
<th>SE</th>
<th>Model G</th>
<th>SE</th>
<th>Model H</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EVA Momentum</strong></td>
<td>(-1.230)</td>
<td>2.635</td>
<td>(-1.711)</td>
<td>2.758</td>
<td>(1.444)</td>
<td>2.681</td>
<td>(-1.775)</td>
<td>3.710</td>
</tr>
<tr>
<td><strong>Sales</strong></td>
<td>0.292</td>
<td>0.200</td>
<td>0.274</td>
<td>0.198</td>
<td>0.366*</td>
<td>0.198</td>
<td>0.293</td>
<td>0.201</td>
</tr>
<tr>
<td><strong>Firm size</strong></td>
<td>776.845***</td>
<td>89.992</td>
<td>762.431***</td>
<td>89.039</td>
<td>627.764***</td>
<td>108.617</td>
<td>775.910***</td>
<td>90.337</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>2.052</td>
<td>2.006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EVA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(-3.439)</td>
<td>1.448</td>
</tr>
<tr>
<td><strong>EVA^2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.004</td>
<td>0.011</td>
</tr>
<tr>
<td><strong>LIBOR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GDP</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Intercept</strong></td>
<td>(-4,336.345)**</td>
<td>549.217</td>
<td>(-4,238.765)**</td>
<td>543.346</td>
<td>(-3,525.179)**</td>
<td>630.818</td>
<td>(-4,333.857)**</td>
<td>550.190</td>
</tr>
<tr>
<td><strong>No. of observations</strong></td>
<td>1,073</td>
<td></td>
<td>1,073</td>
<td></td>
<td>1,073</td>
<td></td>
<td>1,073</td>
<td></td>
</tr>
<tr>
<td><strong>VIF</strong></td>
<td>2.92</td>
<td></td>
<td>4.26</td>
<td></td>
<td>2.74</td>
<td></td>
<td>2.65</td>
<td></td>
</tr>
<tr>
<td><strong>Adjusted r^2</strong></td>
<td>0.8486</td>
<td></td>
<td>0.8493</td>
<td></td>
<td>0.8505</td>
<td></td>
<td>0.8484</td>
<td></td>
</tr>
<tr>
<td><strong>r^2</strong></td>
<td>0.8491</td>
<td></td>
<td>0.8500</td>
<td></td>
<td>0.8512</td>
<td></td>
<td>0.8492</td>
<td></td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>319.79***</td>
<td></td>
<td>315.64***</td>
<td></td>
<td>255.87***</td>
<td></td>
<td>257.69***</td>
<td></td>
</tr>
<tr>
<td><strong>Root MSE</strong></td>
<td>3,269.598</td>
<td></td>
<td>3,261.756</td>
<td></td>
<td>3,248.442</td>
<td></td>
<td>3,271.038</td>
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</tr>
<tr>
<td><strong>Model SS</strong></td>
<td>64,266,883,857.458</td>
<td></td>
<td>64,332,223,171.165</td>
<td></td>
<td>64,424,708,656.565</td>
<td></td>
<td>64,267,520,856.478</td>
<td></td>
</tr>
<tr>
<td><strong>Model df</strong></td>
<td>4</td>
<td></td>
<td>5</td>
<td></td>
<td>5</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Residual SS</strong></td>
<td>11,417,207,703.286</td>
<td></td>
<td>11,351,868,390.175</td>
<td></td>
<td>11,259,382,904.778</td>
<td></td>
<td>11,416,570,705.886</td>
<td></td>
</tr>
<tr>
<td><strong>Residual df</strong></td>
<td>1,068</td>
<td></td>
<td>1,067</td>
<td></td>
<td>1,067</td>
<td></td>
<td>1,067</td>
<td></td>
</tr>
</tbody>
</table>

*p < .1.  **p < .05.  ***p < .01.
The lodging-only sample was tested with the 25 regression models that were used with the pooled sample. The t-test results in all lodging-only models again indicated the relationship between EVA Momentum and total capitalization was not statistically significant. Contrary to Stewart’s (2009) claim, the results of this study do not support EVA Momentum as an early warning device. Based on the evidence in this study, there is not a statistically significant relationship between EVA Momentum and total capitalization.

Additional Results

The results from H3 and H4 indicate EVA Momentum is not related to future value, as measured by market and total capitalization. EVA Momentum may suffer from a matching issue in that it is derived by relating the change in EVA in the current period to sales from the prior period. To investigate a potential matching issue, a series of EVA Momentum-related measures were created and investigated to understand if these new measures were related to future value as defined by market and total capitalization. EVA Momentum is defined as \( \frac{(EVA_1 - EVA_0)}{Sales_0} \) and measures the incremental EVA at time 1 relative to sales at time 0. The potential matching issue was investigated by creating two new measures. EVA Momentum Revised and EVA Momentum Revised2 were defined as \( \frac{(EVA_1 - EVA_0)}{Sales_1} \) and \( \frac{(EVA_1 - EVA_0)}{(Sales_1 - Sales_0)} \), respectively. EVA Momentum Revised and EVA Momentum Revised2 were substituted for EVA Momentum in the H3 and H4 regression models. EVA Momentum Revised and EVA Momentum Revised2 were not found to be related to market or total capitalization.

A final EVA Momentum-related variable was developed to test the relationship between EVA margin and future value. EVA margin was defined as \( \frac{EVA_0}{Sales_0} \). Again, EVA margin was found not to be related to future market or total capitalization.
Hypothesis 5

H5 stated that EVA Momentum is more highly related to financial performance than is ROS, ROA, or EPS. Pearson’s correlations between the independent model variables are shown in Table 7. Regression models with and without firm size were analyzed. Consistent with Lee and Kim (2009), the inclusion of firm size as an independent variable yielded a more efficient regression model. The final regression model was

$$M_1 = \beta_0 + \beta_1 \text{EVAM}_0 + \beta_2 \text{ROS}_0 + \beta_3 \text{ROA}_0 + \beta_4 \text{EPS}_0 + \beta_5 \text{FIRMSIZE}_0 + e_0.$$

Table 8 compares the regression models with market capitalization as the dependent variable, using the pooled and separate lodging, restaurant, and REIT samples. EVA Momentum, $\beta = 10.48$, $t(1,067) = 2.32$, $p = .02$, in the pooled model was found to be more highly related to market capitalization than ROS, $\beta = -6.37$, $t(1,067) = -2.55$, $p = .01$. EPS and ROA were not related to market capitalization at $\beta = 1.36$, $t(1,067) = 0.03$, $p = .98$, and $\beta = 25.40$, $t(1,067) = 1.80$, $p = .07$, respectively. The EVA Momentum coefficient was not statistically significant using the individual lodging, restaurant, and REIT samples. ROA and firm size were found to be related to market capitalization in the lodging, restaurant, and REIT models. The year-over-year change in EPS and percentage change in EPS were substituted for EPS to understand if the change or percentage change were better predictors than EPS. The $t$-tests for the change and percentage change in EPS were not statistically significant, indicating these independent variables were not related to market capitalization.

The regression model to test EVA Momentum with total capitalization as the independent variable was:

$$TC_1 = \beta_0 + \beta_1 \text{EVAM}_0 + \beta_2 \text{ROS}_0 + \beta_3 \text{ROA}_0 + \beta_4 \text{EPS}_0 + \beta_5 \text{FIRMSIZE}_0 + e_0.$$

The results for the pooled, lodging, restaurant, and REIT samples are shown in Table 9.
Table 7

*Pearson's Correlation Matrix*

<table>
<thead>
<tr>
<th></th>
<th>EVA Momentum</th>
<th>ROA</th>
<th>ROS</th>
<th>Change EPS</th>
<th>EPS</th>
<th>Firm size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>EVA Momentum</td>
<td></td>
<td>.0385</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>.2106**</td>
<td>.2074**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROS</td>
<td>.0144</td>
<td>.0210</td>
<td>.0936***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change EPS</td>
<td>.0396</td>
<td>.2111**</td>
<td>.3303**</td>
<td>.1389***</td>
<td></td>
<td></td>
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<tr>
<td>EPS</td>
<td>-.0274</td>
<td>-.0399</td>
<td>.079*</td>
<td>.0330</td>
<td>.0274***</td>
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</tr>
<tr>
<td>Firm size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lodging</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVA Momentum</td>
<td></td>
<td>.1359**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>.1443**</td>
<td>.5123***</td>
<td></td>
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<tr>
<td>ROS</td>
<td>.1107</td>
<td>.0754</td>
<td>.0455</td>
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<td>.2521***</td>
<td>.2620***</td>
<td>.2120***</td>
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</tr>
<tr>
<td>EPS</td>
<td>-.0399</td>
<td>-.2065***</td>
<td>-.0575</td>
<td>-.0321</td>
<td>.3581***</td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVA Momentum</td>
<td></td>
<td>.0735</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ROA</td>
<td>.0182</td>
<td>.1655***</td>
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<tr>
<td>ROS</td>
<td>-.0602</td>
<td>-.0243</td>
<td>.7737***</td>
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<tr>
<td>Change EPS</td>
<td>.0529</td>
<td>.3693***</td>
<td>.6199***</td>
<td>.2079***</td>
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<td></td>
</tr>
<tr>
<td>EPS</td>
<td>-.0163</td>
<td>.2122***</td>
<td>.1134</td>
<td>-.0215</td>
<td>.2599***</td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>REIT</td>
<td></td>
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<tr>
<td>EVA Momentum</td>
<td></td>
<td>.0472</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>ROA</td>
<td>.3128***</td>
<td>.1018**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROS</td>
<td>.0348</td>
<td>.0327</td>
<td>.0748*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change EPS</td>
<td>.0534</td>
<td>.0746*</td>
<td>.2875***</td>
<td>.0934*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPS</td>
<td>-.0160</td>
<td>-.2491***</td>
<td>.0051</td>
<td>.0681</td>
<td>.1818***</td>
<td></td>
</tr>
</tbody>
</table>

*p < .1.  **p < .05.  ***p < .01.
Table 8

**Pooled Regression Analysis Predicting Market Capitalization from 2001–2008**

<table>
<thead>
<tr>
<th></th>
<th>Pooled</th>
<th>Lodging</th>
<th>Restaurant</th>
<th>REIT</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>EVA Momentum</td>
<td>10.477***</td>
<td>4.514</td>
<td>61.072</td>
<td>41.358</td>
<td>60.352</td>
<td>79.417</td>
<td>2.756</td>
<td>2.502</td>
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<tr>
<td>ROS</td>
<td>–6.373**</td>
<td>2.501</td>
<td>–8.774***</td>
<td>2.953</td>
<td>0.523</td>
<td>7.158</td>
<td>2.297</td>
<td>2.238</td>
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<tr>
<td>EPS</td>
<td>1.3615</td>
<td>53.117</td>
<td>–3.710</td>
<td>168.150</td>
<td>–176.362</td>
<td>163.881</td>
<td>42.397</td>
<td>51.266</td>
</tr>
<tr>
<td>Firm Size</td>
<td>2128.065***</td>
<td>212.217</td>
<td>2461.024***</td>
<td>385.586</td>
<td>3991.021***</td>
<td>738.112</td>
<td>1,994,654***</td>
<td>154.130</td>
</tr>
<tr>
<td>% change EPS Intercept</td>
<td>–12270.115***</td>
<td>1,368.840</td>
<td>–13939.390***</td>
<td>2,432.069</td>
<td>–21503.298***</td>
<td>4,217.521</td>
<td>–13,011.661***</td>
<td>1,098.853</td>
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<tr>
<td>No. of observations</td>
<td>1,073</td>
<td>212</td>
<td>269</td>
<td>592</td>
<td>1.13</td>
<td>1.32</td>
<td>1.37</td>
<td>1.13</td>
</tr>
<tr>
<td>VIF</td>
<td>0.2720</td>
<td>0.3456</td>
<td>0.3861</td>
<td>0.4669</td>
<td>0.4714</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Adjusted $r^2$</td>
<td>0.2754</td>
<td>0.3611</td>
<td>0.3975</td>
<td>0.4714</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$r^2$</td>
<td>23.43***</td>
<td>23.29***</td>
<td>34.71***</td>
<td>104.54***</td>
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<tr>
<td>$F$-test</td>
<td>5,040.534</td>
<td>5,856.022</td>
<td>6,846.339</td>
<td>2,261,952</td>
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</tr>
<tr>
<td>Root MSE</td>
<td>10,302,518,552.428</td>
<td>3,992,983,736.849</td>
<td>8,134,062,060.340</td>
<td>2,674,263,862.987</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model SS</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model df</td>
<td>27,109,246,659.276</td>
<td>7,064,356,249.175</td>
<td>12,327,430,718.572</td>
<td>2,998,226,397.880</td>
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<tr>
<td>Residual SS</td>
<td>1,067</td>
<td>206</td>
<td>263</td>
<td>586</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

*p < .1.  **p < .05.  ***p < .01.
Table 9

**Pooled Regression Analysis Predicting Total Capitalization from 2001–2008**

<table>
<thead>
<tr>
<th></th>
<th>Pooled</th>
<th>Lodging</th>
<th>Restaurant</th>
<th>REIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( B )</td>
<td>( SE )</td>
<td>( B )</td>
<td>( SE )</td>
</tr>
<tr>
<td>EVA Momentum</td>
<td>12.804**</td>
<td>5.661</td>
<td>67.017</td>
<td>50.912</td>
</tr>
<tr>
<td>ROA</td>
<td>34.559</td>
<td>21.180</td>
<td>103.909***</td>
<td>26.094</td>
</tr>
<tr>
<td>EPS</td>
<td>–50.845</td>
<td>75.256</td>
<td>1.279</td>
<td>232.052</td>
</tr>
<tr>
<td>Firm Size</td>
<td>3,576.405***</td>
<td>279.927</td>
<td>3,705.451***</td>
<td>454.321</td>
</tr>
<tr>
<td>% change EPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>–20,541.999***</td>
<td>1,824.642</td>
<td>–20,769.892***</td>
<td>2,938.646</td>
</tr>
</tbody>
</table>

|                     |               |              |              |               |              |             |           |              |
| No. of observations | 1,073         | 212          | 269          | 592           |              |             |           |              |
| VIF                 | 1.13          | 1.32         | 1.37         | 1.13          |              |             |           |              |
| Adjusted \( r^2 \) | 0.3737         | 0.4595       | 0.4164       | 0.5654        |              |             |           |              |
| \( r^2 \)          | 0.3766         | 0.4723       | 0.4273       | 0.5691        |              |             |           |              |
| \( F \)-test        | 37.71***       | 36.87***     | 39.24***     | 154.80***     |              |             |           |              |
| Root MSE            | 6,649.610     | 7,001.995    | 8,998.704    | 3,753.268     |              |             |           |              |
| Model SS            | 28,504,211,604.790 | 9,037,995,380.696 | 15,888,477,433.452 | 10,903,099,060.170 |
| Model df            | 5              |              | 5            |              |              |             |           |              |
| Residual SS         | 47,179,879,956.554 | 10,099,754,632.972 | 21,296,865,266.560 | 8,254,995,691.125 |
| Residual df         | 1,067          | 206          | 263          | 586           |              |             |           |              |

**\( **p < .05.  ***p < .01.**
The pooled results showed EVA Momentum, $\beta = 12.80$, $t(1,067) = 2.26$, $p = .02$, was more highly related to total capitalization than return on sales, $\beta = –8.85$, $t(1,067) = –2.40$, $p = .02$. The ROA and EPS coefficients were not statistically significant at $\beta = 34.56$, $t(1,067) = 1.63$, $p = .10$ and $\beta = –50.84$, $t(1,067) = –0.68$, $p = .50$, respectively. EVA Momentum was found to not be related to total capitalization using the separate lodging, restaurant, and REIT samples.

EVA Momentum Revised and EVA Momentum Revised2 were substituted for EVA Momentum using the $H5$ regression model and were found to not be more highly related to market or total capitalization than were ROA, ROS, or EPS.
CHAPTER 5. SUMMARY AND DISCUSSION

Ehrbar (2010) stated EVA Momentum facilitated performance comparisons of divisions and companies of different sizes and different industries. Stewart (2009) stated EVA Momentum is an early warning device and is the single best performance measure. This study was designed to investigate EVA Momentum as a performance measure in the U.S. lodging industry and tested whether EVA Momentum could be used as a comparative measure in similar and different industries, EVA Momentum was related to future financial performance, and EVA Momentum was more highly related future value than were traditional financial measures. The summary of findings, study limitations, and recommendations for future research are presented in this chapter.

Summary of Findings

Five hypotheses were explored in this study. The first hypothesis stated there is no difference between lodging and restaurant company EVA Momentum. Data were collected from the evaDimensions database and Compustat for lodging, restaurant, and REITs from 2001–2008. The sample for the first two hypotheses used 257 lodging, 299 restaurant, and 690 firm years from 2001–2008. EVA Momentum ranged from −0.0085 to 0.0158 for lodging, −0.0091 to 0.0178 for restaurants, and 0.0788 to 0.0245 for REITs from 2001–2008. Mean EVA Momentum from 2001–2008 for lodging ($M = 0.0024$) was lower than that from the restaurant sample ($M = 0.0046$) and higher than that from the REITs ($M = −0.0226$).

Two-tailed $t$-test results supported the first hypothesis for the period from 2001–2008. No statistically significant difference was found between lodging and restaurant EVA Momentum. This finding is not surprising considering the similarities between the lodging and restaurant industries. The lodging and restaurant industries are both marketed through
national or international brands, experience high customer contact, have relatively high labor costs that can be varied on a daily basis, and enjoy a mix of earnings that include owned, leased, managed, and franchised income streams. The results support using EVA Momentum to compare companies from similar industries.

The second hypothesis stated lodging companies have higher EVA Momentum than do fixed asset-intensive companies. REITs were used as a proxy for fixed asset-intensive companies. The one-way ANOVA results comparing lodging and REITs from 2001–2008 showed EVA Momentum was higher in lodging than in fixed asset-intensive REITs, but the results were not statistically significant. REIT EVA Momentum was more volatile than was lodging. Lodging industry fee income is based largely on a negotiated percentage of managed and franchised hotel revenues, or delivery of room nights through reservations and other central delivery systems. Incentive fee income is typically a negotiated fee that is based on a percentage of income, or income improvement. Owned property income is driven by short-term overnight rentals that can be maximized via yield management techniques. Lodging units are able to respond on a daily basis to changes in volume with variable staffing changes. In contrast to lodging, REIT income is largely dependent on multi-year, long-term lease revenue, and interest or other semi-variable and fixed expenses. REIT market capitalization is more volatile and reflects the changes in underlying lodging unit asset values during real estate cycles. These industry characteristics result in lodging experiencing less earnings volatility than do REITs. The EVA Momentum results of this study reflected this volatility and showed EVA Momentum in lodging was higher than fixed asset-intensive REITs, although the results were not statistically significant.
Hypotheses 3 and 4 stated EVA Momentum was related to future value as measured by market and total capitalization, respectively. This study found that EVA Momentum was not related to future market or total capitalization for the pooled or lodging samples. This finding is contrary to Stewart’s (2009) claim that EVA Momentum is an early warning device. A series of EVA Momentum-related measures were developed and investigated to better match the change in EVA with sales, but none of the new measures were found to be related to market or total capitalization. This might be explained partly by EVA adjustments or by the lack of understanding and adoption of EVA and EVA Momentum. Future market capitalization is partly dependent on investors’ perceptions of historic GAAP-based earnings and on sell-side analyst recommendations that use GAAP-based financial statements as a basis for future performance predictions. If the number and complexity of EVA adjustments are not fully understood by investors and analysts, then GAAP-based forecasts may diverge from EVA and EVA Momentum. This lack of visibility and understanding of EVA adjustments may partly explain why EVA Momentum is not related to future value.

Hypothesis 5 stated EVA Momentum is more highly related to financial performance than is ROS, ROA, or EPS. EVA Momentum was compared to ROA, ROS, and EPS using the pooled and the lodging, restaurant, and REIT samples from 2001–2008. The pooled regression results supported that EVA Momentum was more highly related to financial performance, as measured by both market and total capitalization, than were ROA, ROS, and EPS. The regression results for EVA Momentum as a predictor were not statistically significant when using the separate lodging, restaurant, or REIT samples. This suggests that EVA Momentum might be a good predictor when considering a broad portfolio of diverse
companies but was not a good predictor of future financial performance in three industries tested in this study.

This is the first known empirical study of EVA Momentum in any industry. Performance measurement in lodging uses a wide variety of metrics. In the absence of a single best performance measure, the balanced scorecard approach is commonly adopted by lodging industry units and companies. The results of this EVA Momentum study as a performance measure are mixed. Using EVA Momentum to compare companies across industries is promising. EVA Momentum has been shown to be a potential measure for comparing performance across similar industries, but additional work is necessary to determine if EVA Momentum is a viable measure for comparing different industries. EVA Momentum was found to not be a good predictor of future financial performance. EVA Momentum was shown to be more highly related to future performance than were three commonly used financial measures in a multi-industry sample, but EVA Momentum was not related to future performance using the separate lodging, restaurant, or REIT samples.

The results of this research are the first step in determining the value of EVA Momentum as a performance measure in the lodging industry. EVA Momentum is a new metric that attempts to provide a single best performance measure, but continued research in the lodging industry is necessary to provide industry practitioners with performance measures that better serve the needs of customers, employees, and investors. Industry practitioners will continue to use the BSC model or multiple performance measures while EVA Momentum and other performance measures are further investigated.
Performance measurement is an area where academicians can close the gap between hospitality research and industry practices. “What gets measured gets done” is a phrase that resonates with management teams and other stakeholders throughout the lodging industry.

**Limitations of the Study**

As the first known study of EVA Momentum, the research limitations should be considered in conjunction with the findings. REITs were not widely adopted as an ownership form prior to the year 2000. Limited REIT sample size prior to 2000 reduced the time period for this study to 2001–2008. A longer time period would have provided a larger sample for pooled and industry-specific testing.

Annual measurement data was used in this study. Quarterly financial information would allow for measuring EVA Momentum’s relationship to market or total capitalization within a reporting window that was closer to the EVA Momentum measurement period. Alternatively, multiyear market and total capitalization could have been used as independent variables to determine if EVA Momentum is related to longer-term financial performance.

**Recommendations for Future Research**

Future EVA Momentum research should consider an expanded time frame to measure market and total capitalization as dependent variables. This research concentrated on market and total capitalization in the 1-year period following the EVA Momentum measurement. Future research should consider the use of quarterly or multiyear market and total capitalization to test EVA Momentum as a predictor of future value over different time horizons. The sample for future studies should be expanded to include additional industries and international companies.
EVA Momentum in its simplest form is defined as:

\[ \text{EVA Momentum} = \frac{(\text{EVA}_1 - \text{EVA}_0)}{\text{Sales}_0}. \]

Future research should investigate the size and nature of EVA adjustments and determine whether the adjustments used to arrive at NOPAT and capital result in EVA Momentum that is significantly different from the baseline EVA Momentum definition. This difference might not be fully understood by investors and analysts when considering investments and recommendations that affect future values.

Additionally, this study used only U.S.-based lodging, restaurant, and REIT companies in the sample. EVA Momentum comparisons with a wider range of industries, including financial institutions and technology companies, should be considered. Finally, traditional financial measures other than ROA, ROS, and EPS should be compared to EVA Momentum to further understand how EVA Momentum benchmarks against other performance measures.
APPENDIX. SUPPLEMENTAL MATERIAL
### Table A1

**Performance Measurement Research in the Lodging Industry**

<table>
<thead>
<tr>
<th>Author (year), journal</th>
<th>Study description</th>
<th>Major findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCOUNTING/FINANCIAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ganchev (2000) <em>Cornell Hotel &amp; Restaurant Administration Quarterly</em></td>
<td>The study reviewed the methodology for measuring value drivers and determining the value of a hotel asset</td>
<td>Article provided an example of industry valuation methodology and introduced economic value added (EVA) to hospitality literature.</td>
</tr>
<tr>
<td>Mongiello &amp; Harris (2005) <em>International Journal of Contemporary Hospitality Management</em></td>
<td>Interviews with eight industry managers were completed to understand managerial accounting’s linkage to international hotel company governance.</td>
<td>The results showed hotel general managers used a wider range of performance measures than corporate managers.</td>
</tr>
<tr>
<td>Ryu &amp; Jang (2004) <em>Journal of Hospitality Financial Management</em></td>
<td>Five years of commercial and casino hotel results were compared using traditional cash flow, liquidity, and solvency measures.</td>
<td>Casino hotels showed higher liquidity levels, but no statistically significant differences were reported from hotels for profitability measures.</td>
</tr>
<tr>
<td><strong>BALANCED SCORECARD (BSC)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atkinson &amp; Brown (2001) <em>International Journal of Contemporary Hospitality Management</em></td>
<td>A survey of 88 U.K.-based hotel companies measured the extent to which financial and non-financial measures were used to measure performance.</td>
<td>Financial measures dominated performance measurement. Non-financial measures most widely used were quality of service, customer satisfaction, sales growth, and customer loyalty.</td>
</tr>
<tr>
<td>Cruz (2007) <em>International Journal of Contemporary Hospitality Management</em></td>
<td>Weaknesses in historic budget processes and systems that emphasized forward looking performance were explored.</td>
<td>Dashboards which replicated the functionality of a balanced scorecard were reported in Portuguese hotels. The use of dashboards and forward looking metrics should be further investigated in hospitality research.</td>
</tr>
<tr>
<td>Denton &amp; White (2000) <em>Cornell Hotel &amp; Restaurant Administration Quarterly</em></td>
<td>A case study showed the development and implementation of a balanced scorecard in limited service properties at White Lodging.</td>
<td>A BSC was used to better align the interests of hotel owners and hotel management companies. The White Lodging metrics presented were the most detailed in lodging industry BSC research.</td>
</tr>
<tr>
<td>Doran, Haddad, &amp; Chow (2002) <em>International Journal of Hospitality &amp; Tourism Administration</em></td>
<td>A review of BSC implementation at two hotel companies and general manager interviews were used to better understand hotel BSCs.</td>
<td>Specific BSC measurements, pitfalls and a process for BSC implementation were presented. This study extended the work of Denton and White (2002) and provided specific hotel-related BSC measures.</td>
</tr>
<tr>
<td>Evans (2005) <em>International Journal of Contemporary Hospitality Management</em></td>
<td>An exploratory survey of UK-based hotels compared BSC practices to BSC literature.</td>
<td>The results provided specific measures used by respondents and suggested further research was necessary to show the linkage between BSC performance measures, and company strategy and vision.</td>
</tr>
</tbody>
</table>
BSC perspectives were examined in Chinese hotels using a structural equation model (SEM). The cause-and-effect relationships between the BSC perspectives and linkage between non-financial and financial performance measures were explored.

The results showed a cause and effect relationship between non-financial and financial performance measures. There is a positive relationship between learning and growth and internal process, and internal process and financial perspectives. A BSC strategy map was presented.

Harris & Mongiello (2001) *International Journal of Contemporary Hospitality Management*  
A survey of hotel general managers from different brands was conducted to understand what measures are used, and how measures are interpreted in decision-making.

Measures used by managers were ranked based on perceived level of importance. Comparisons were provided between managers at different brands showing the emphasis placed on customer, finance, operations, and human resource dimensions.

Park & Gagnon (2006) *Journal of Human Resources in Hospitality & Tourism*  
A survey of 129 Korean hotels was used with a structural equation model to test the relationship between the four BSC perspectives.

The results showed a positive relationship between learning and growth and internal business process, internal business process and customer perspective, and customer perspective and financial perspective.

A three year longitudinal study of a UK hotel chain was undertaken to understand the BSC as a strategic control tool.

The case study showed the evolution of the BSC at a hotel company. The authors stated marketing will increase in strategic importance and companies should benchmark against top performers.

Phillips & Louvieris (2005) *Journal of Travel Research*  
This exploratory case study utilized interviews of 38 SME stakeholders to determine detailed performance measure research areas.

Respondents’ suggestions included collecting and computerizing critical financial information, linking forecasting and management information systems, building customer profiles and relationships, measuring quality, investing in staff, measuring productivity, and benchmarking.

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**DATA ENVELOPMENT ANALYSIS (DEA)**

Barros (2005) *Annals of Tourism Research*  
Data envelopment analysis (DEA) was used to estimate an efficient frontier for 43 Portuguese hotels. The study used multiple context-specific inputs and outputs.

The results showed rural, older, and small-scale hotels were less efficient than city center, newer, and larger scale hotels. DEA can be used to identify an optimal frontier, but does not identify which input/output factors lead to efficient operations.

C. F. Chen (2007) *Tourism Management*  
A stochastic cost frontier function was used to measure cost efficiencies at 55 Taiwanese hotels. The stochastic methodology provided an advantage over DEA by isolating the influence of factors.

Chain hotels were reported to be more efficient than independent hotels. Hotel location and size did not provide a significant difference in relative efficiency results.

T. H. Chen (2009), *International Journal of Hospitality Management*  
DEA was applied to seven Asian resorts to rank properties by efficiency. Using two inputs and two outputs, the authors employed common weights to further refine the initial DEA results.

The use of an additional lemma to refine the efficiency rankings and provide a better basis for hotel comparisons advanced DEA research. CEO interviews provided some context for the results. DEA's inability to identify the specific factors driving efficiency is a weakness that prevents adoption by practitioners.
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Journal/Publication</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiang, Tsai, &amp; Wang (2004)</td>
<td><em>International Journal of Hospitality Management</em></td>
<td>Franchised, internationally managed, and independent hotels were compared using DEA to determine if one form of affiliation was more efficient. The results did not show one form of management to be more efficient.</td>
</tr>
<tr>
<td>Christou &amp; Sigala (2002)</td>
<td><em>Acta Touristica</em></td>
<td>Quality measurement challenges in lodging and an application of total quality management (TQM) were reviewed to develop a model for measuring lodging industry quality. A model for future DEA empirical research in the lodging industry was presented to measure total quality management (TQM).</td>
</tr>
<tr>
<td>Hu &amp; Cai (2004)</td>
<td><em>Journal of Travel &amp; Tourism Management</em></td>
<td>DEA was applied to 242 California hotels to understand labor productivity at bed and breakfast, limited-, and full-service hotels. A regression model was developed to identify the determinants explaining productivity levels. Higher labor productivity was reported where managers were higher paid in bed and breakfast and limited service hotels. The regression model supplemented DEA and yielded a relevant DEA-based study for industry practitioners.</td>
</tr>
<tr>
<td>Hwang &amp; Chang (2003)</td>
<td><em>Tourism Management</em></td>
<td>DEA was used to measure efficiency in 45 Taiwanese hotels using multiple inputs and outputs. Changes in annual efficiencies were measured over a five-year period. A larger number of relevant inputs and outputs were used to rank the efficiency, and changes in efficiency.</td>
</tr>
<tr>
<td>Jones &amp; Siag (2009)</td>
<td><em>Tourism &amp; Hospitality Research</em></td>
<td>Rooms cleaned per hour and rooms cleaned were used to measure productivity. The authors did not use DEA, stating DEA measured only relative performance and did not measure specific performance. The results refuted previous studies and showed differences in hotel age, location, size, and demand variations did not affect productivity. The findings are relevant to practitioners who widely use the study's input and output measures.</td>
</tr>
<tr>
<td>Sanjeev (2007)</td>
<td><em>International Journal of Hospitality Management</em></td>
<td>DEA methodology was used to measure efficiency at 68 Indian hotel companies using financial inputs and outputs. The results ranked hotel companies based on efficiency. This study is important in that it departed from hotel operating inputs and outputs and used financial inputs and outputs.</td>
</tr>
<tr>
<td>Sigala (2004)</td>
<td><em>Journal of Travel &amp; Tourism Management</em></td>
<td>Three-star UK-based hotels were surveyed to demonstrate how step-wise DEA can be used to measure hotel productivity. Four different step-wise models showed productivity was affected by hotel design, management situation, and ownership. Chain hotels were shown to be more efficient than independent hotels.</td>
</tr>
<tr>
<td>Sun &amp; Lu (2005)</td>
<td><em>Asia-Pacific Journal of Operational Research</em></td>
<td>A slack-based DEA approach was used with 55 Taiwanese hotels to measure occupancy, catering, and managerial efficiency. The results showed proximity to the airport, number of employees, and availability of catering space was related to managerial efficiency. The slacks-based approach extended previous DEA-related hotel research.</td>
</tr>
<tr>
<td>Tsaur (2001)</td>
<td><em>Asia Pacific Journal of Tourism Research</em></td>
<td>DEA was used to measure the relative efficiency of 53 tourist hotels. Seven inputs and six outputs were used to rank efficiency based on total hotel results, and for the rooms and catering divisions. Chain hotels reported higher efficiency scores than unaffiliated hotels. Hotels with individual guests outperformed hotels with a larger group base. Inputs, outputs, and results were most relevant DEA study for practitioners.</td>
</tr>
</tbody>
</table>
**HUMAN RESOURCES**

**Cho, Woods, Jang, & Erdem (2006),* Hospitality Management***

Human resource leaders in 78 hospitality companies were surveyed to understand the relationship between human resource and company performance as measured by ROA, labor productivity, and turnover.

Regression results showed only employee turnover rate was related to company performance. Incentive plans were positively related to increased sales and earnings, and to lower turnover rates. Adoption of grievance procedures and internal recruiting programs were related to higher turnover.

**Hinkin & Tracey (2006),* Cornell Hospitality Research***

Hotels were studied to understand the costs associated with pre-departure, recruiting, selection, orientation and training, and productivity loss.

Over half of turnover costs are related to productivity loss, with pre-departure costs being lowest.

**Tracey & Hinkin (2006),* Cornell Hospitality Research***

Different size, quality level, chain affiliation, and locations were studied for different job types to understand how hotel turnover costs vary.

Selection costs were not found to be higher for more complex jobs. Higher pre-departure, orientation, and recruiting costs were reported for low ADR properties. The highest turnover costs were at complex jobs in high ADR hotels located in high cost-of-living areas.

**Warech & Tracey (2004),* Cornell Hotel & Restaurant Administration Quarterly***

Watson Wyatt’s measurement of human resource contributions to financial performance, as measured by market value, was investigated.

Human resource activities are investments, not costs. The percentage of market value associated various human resource activities was reported.

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**SERVICE/GUEST SATISFACTION**

**Burns, Graefe, & Absher (2003),* Leisure Sciences***

Customer satisfaction scores, and the gap between satisfaction and importance levels were studied at recreation facilities.

Satisfaction-only measures were statistically better than gap scores.

**Fallon & Schofield (2000),* Journal of Quality Assurance in Hospitality & Tourism***

Managers, service staff, and customers were surveyed using SERVQUAL to measure perceived service quality and understand service performance gaps.

The results showed managers and service staff rate quality more highly than customers. Service staff quality perceptions were more closely associated with customers than with manager perceptions.

**Gomes, Yasin, & Lisboa (2007),* International Journal of Contemporary Hospitality Management***

A service operational effectiveness (SOE) model was proposed to measure service in a hospitality setting. Interviews with 35 U.S.-Middle East hospitality managers were used to validate the model.

Introduced new SOE model for hospitality service measurement. No empirical data or specific service areas were defined for SOE approach.


The study measured service quality by developing and administering a survey instrument based on DINESERV.

Service quality positively impacted customer satisfaction which resulted in positive word-of-mouth restaurant recommendations.
<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Journal</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lynn (2003)</td>
<td><em>International Journal of Hospitality Management</em></td>
<td>The purpose of the study was to assess whether the different measurement instruments would support a weak relationship between service quality and tip amounts. The results supported a weak relationship between customer perceptions of service quality and tips.</td>
</tr>
<tr>
<td>Schall (2003)</td>
<td><em>Cornell Hotel &amp; Restaurant Administration Quarterly</em></td>
<td>A review of potential weaknesses in guest satisfaction surveys provided recommendations to improve surveys and survey validity. Sample, scaling, unidimensionality, and time lag examples were provided to identify guest survey weaknesses. Valuable information was provided for practitioners to improved guest survey validity.</td>
</tr>
<tr>
<td>Ting-Kwong Luk &amp; Layton (2004)</td>
<td><em>Total Quality Management &amp; Business Excellence</em></td>
<td>A convenient sample was used to understand the limitations of the SERVQUAL scale. The results showed performance scores, and not gap scores provided a more valid room service performance measure.</td>
</tr>
<tr>
<td>Yilmaz (2009)</td>
<td><em>Anatolia: An International Journal of Tourism &amp; Hospitality Research</em></td>
<td>Customers in 3-, 4-, and 5-star Turkish hotels were surveyed to understand the relative importance of SERVPERV factors to predicting customer perceptions of service quality. Empathy, reliability, assurance-responsiveness, and tangible factors were ranked as most to least important in predicting customer perceptions of service quality.</td>
</tr>
<tr>
<td>Bergin-Seers &amp; Jago (2007)</td>
<td><em>Tourism &amp; Hospitality Research</em></td>
<td>An expert panel, and in-depth interviews of seven successful small hotel owners determined key financial and non-financial performance indicators. A detailed list of key performance measures was identified. The authors concluded successful owners used a balance of financial and non-financial measures to understand inputs and outputs. The specific examples of measures used in small hotels are of value to industry practitioners.</td>
</tr>
<tr>
<td>Chung &amp; Law (2003)</td>
<td><em>Hospitality Management</em></td>
<td>Hotel managers were surveyed to measure website content based on facilities, contact information, reservations information, area information, and website management. Website performance was better in higher priced hotels. This study could be expanded to include additional measurement criteria and applied to company-wide or brand websites.</td>
</tr>
<tr>
<td>Haktanir &amp; Harris (2005)</td>
<td><em>International Journal of Contemporary Hospitality Management</em></td>
<td>An exploratory study of a Cyprus five-star hotel identified six major measurement-related themes, and examples of measurement methods employed. A &quot;what-how-why&quot; matrix was used to document issues associated with performance measurement practices.</td>
</tr>
<tr>
<td>Montoro-Sánchez, Mas-Verdu, &amp; Soriano (2008)</td>
<td><em>Services Industry Journal</em></td>
<td>A survey of 78 small and medium-sized Spanish hotels measured factors affecting hotel success and productivity. The results showed minimum cost output differences for hotel owner/managers with different demographic characteristics, hotels with different capital funding sources, and hotels with different technology and human resource commitments.</td>
</tr>
<tr>
<td>Parkan (2005)</td>
<td><em>International Journal of Productivity and Performance Management</em></td>
<td>Operational Competitiveness Rating (OCRA) was used to compare two family owned hotels to city standards using key revenue and expense categories. OCRA was introduced as a new hotel benchmarking tool. A computer model could be developed to incorporate the complex mathematics that provides practitioners with a user friendly implementation tool.</td>
</tr>
</tbody>
</table>

**OTHER STUDIES**
<table>
<thead>
<tr>
<th>Reference</th>
<th>Source</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raab, Mayer, Kim, &amp; Shoemaker (2009)</td>
<td><em>Journal of Hospitality &amp; Tourism Research</em></td>
<td>The study demonstrated how price-sensitive measurement (PSM) can be used in a restaurant to understand customer price sensitivity and determine an optimal and indifference price point. Dinner customers were surveyed using PSM to demonstrate how customer reaction can be measured at varying price points.</td>
</tr>
<tr>
<td>Thompson &amp; Sohn (2009)</td>
<td><em>Cornell Hospitality Quarterly</em></td>
<td>Check-open and entire check time RevPASH measurement methods were tested to determine accuracy. Entire time RevPASH measurement method, which used the period from check open to check close, was more accurate than the open time method.</td>
</tr>
<tr>
<td>Wadongo, Edwin, &amp; Oscar (2010)</td>
<td><em>Managing Leisure</em></td>
<td>A survey of five-star Kenyon hotels was completed to understand the relationships between various types of managers and performance measures. Analyzers and motivators were positively related to determinant and result measures. Taskmasters were strongly related to resource utilization, innovation, and quality.</td>
</tr>
<tr>
<td>Yoo &amp; Chon (2008)</td>
<td><em>Journal of Travel Research</em></td>
<td>A measurement scale was developed for understanding the factors that affect convention attendance. Destination stimuli, networking opportunities, educational opportunities, safety and health situation, and travelability were five dimensions in the final instrument.</td>
</tr>
</tbody>
</table>
### Table A2

**Economic Value Added (EVA)-related Research**

<table>
<thead>
<tr>
<th>Author (year), Journal</th>
<th>Study Description</th>
<th>Major Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EVA FRAMEWORK</strong></td>
<td></td>
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</tr>
<tr>
<td>Dillon &amp; Owers (1997)</td>
<td><em>Financial Practice &amp; Education</em></td>
<td>A review of EVA and other financial metrics was presented, and the relationship between EVA and NPV was discussed.</td>
</tr>
<tr>
<td>Forker &amp; Powell (2008)</td>
<td><em>European Accounting Review</em></td>
<td>A residual income valuation model was used to study the forecasting accuracy of 25 different performance measures.</td>
</tr>
<tr>
<td>Garvey &amp; Milbourn (2000)</td>
<td><em>Journal of Accounting Research</em></td>
<td>Over 6,700 firm years from 1986-1997 were analyzed to understand the correlation between EVA adoption and stock performance, and the incremental value added by EVA.</td>
</tr>
<tr>
<td>Magni (2009)</td>
<td><em>European Journal of Operations Research</em></td>
<td>Over 200 firms were studied over 15 years to determine if EVA included incremental information content versus EPS when predicting future income.</td>
</tr>
<tr>
<td>Stewart (1991)</td>
<td><em>The Quest for Value: A Guide for Senior Managers</em></td>
<td>Stewart's seminal text introduced EVA, its theoretical underpinnings, and examples of applications of EVA.</td>
</tr>
<tr>
<td>Stewart (1995)</td>
<td><em>Fortune</em></td>
<td>Stewart suggested EVA can lead to significant cultural changes and improved performance if common implementation mistakes are avoided.</td>
</tr>
<tr>
<td>Tully (1993)</td>
<td><em>Fortune</em></td>
<td>Cover story describing EVA as a performance measure.</td>
</tr>
<tr>
<td><strong>EVA &amp; TRADITIONAL MEASURES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnson (2001)</td>
<td><em>Journal of Equipment Lease Financing</em></td>
<td>A study of 20 leasing companies was completed to determine the relationship between accounting and economic value.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Title/Source</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------</td>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>McIntyre (1999)</td>
<td><em>Business Horizons</em></td>
<td>A series of examples were reviewed to show how different depreciation methods can influence EVA and ROA calculations.</td>
</tr>
<tr>
<td>Nichols (1998)</td>
<td><em>Management Accounting: Magazine for Chartered Management Accountants</em></td>
<td>Cash flow return on investment (CFROI), economic value added (EVA), and cash value added (CVA) were studied to determine the impact of each measure on company success.</td>
</tr>
<tr>
<td>Pohlen &amp; Coleman (2005)</td>
<td><em>SAM Advanced Management Journal</em></td>
<td>A model that linked activity-based costing (ABC) and EVA was developed to align the interests of supply chain participants.</td>
</tr>
<tr>
<td>Johnson (2001)</td>
<td><em>Journal of Equipment Lease Financing</em></td>
<td>Twenty leasing companies were studied to determine the relationship between accounting and economic earnings.</td>
</tr>
<tr>
<td>Sequeria (2000)</td>
<td><em>Bottom Line</em></td>
<td>The rationale and benefits for EVA were outlined.</td>
</tr>
<tr>
<td>Stern, Stewart, &amp; Chew (1996)</td>
<td><em>European Financial Management</em></td>
<td>The authors made a case for using EVA in the context of leveraged buyouts (LBOs) and discussed adjustments used to arrive at NOPAT.</td>
</tr>
<tr>
<td>Wachowicz &amp; Shrieves (2001)</td>
<td><em>Entrepreneur</em></td>
<td>EVA adjustments and the relationship between economic income and the NPV of free-cash-flow were explored.</td>
</tr>
<tr>
<td>Weaver (2001)</td>
<td><em>Journal of Applied Science</em></td>
<td>A survey of 29 EVA adopters was completed to understand the differences between EVA theory and industry practice.</td>
</tr>
<tr>
<td>Yook (1999)</td>
<td><em>Financial Practice &amp; Education</em></td>
<td>Compustat PC Plus data calculations were compared to the Stern Stewart &amp; Co.’s database to determine the accuracy of EVA calculations.</td>
</tr>
<tr>
<td>Young (1999)</td>
<td><em>Journal of Financial Statement Analysis</em></td>
<td>The major adjustments necessary to transform accounting GAAP-based information to net operating profit after taxes (NOPAT) were explored.</td>
</tr>
</tbody>
</table>

**EVA ADJUSTMENTS**

- Accounting and economic earnings were found not to be related.
- Challenges of converting GAAP income to economic income were explored and a training expense example was presented.
- Up to 120 measurement adjustments could be made to accounting income to arrive at NOPAT. Criteria for adjustments were presented in a four-part test.
- The present value of economic profit from EVA was shown to be equivalent to free-cash-flow. Adjustments required to arrive at economic profit were discussed.
- The results showed that on average, companies made 19 adjustments to arrive at NOPAT and invested capital amounts.
- The Stern Stewart & Co. database could be replicated using Compustat PC Plus data with a high degree of correlation.
- The article cited over 150 potential EVA adjustments and described the rationale for the most common adjustments.
## EVA-ADOPTERS & NON-ADOPTERS

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Journal/Year</th>
<th>Summary</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdeen &amp; Haight (2002)</td>
<td><em>Journal of Applied Business Research</em></td>
<td>A comparison of companies in the Fortune 500 that used EVA and companies that did not use EVA was completed to determine if EVA adopters achieved superior performance.</td>
<td>The results showed that EVA users performed better in almost all financial metrics than non-EVA companies in 1997-1998.</td>
</tr>
<tr>
<td>Dodd &amp; Johns (1999)</td>
<td><em>Business and Economic Review</em></td>
<td>A survey of 88 United States-based companies was completed to determine differences in EVA adopters and non-EVA companies.</td>
<td>The results showed EVA adopters de-emphasized effectiveness, efficiency, and adaptability measures, and warned that customer satisfaction measures should be maintained in EVA companies.</td>
</tr>
<tr>
<td>Hogan &amp; Lewis (2005)</td>
<td><em>Journal of Financial and Quantitative Analysis</em></td>
<td>The study compared anticipated EVA adopters, surprise adopters, anticipated non-adopters, and surprise non-adopters to understand operating performance, investments, and shareholder value.</td>
<td>The results showed significant operating and market value improvements following adoption of an economic profit plan.</td>
</tr>
<tr>
<td>Lovita &amp; Costigan (2002)</td>
<td><em>Management Accounting Research</em></td>
<td>EVA adopters were compared to non-adopters to understand the characteristics of EVA firms and how EVA firms structure compensation plans.</td>
<td>Defender firms and firms with a greater percentage of institutional ownership were found to be more likely to use EVA as a measurement tool.</td>
</tr>
<tr>
<td>Wallace (1997)</td>
<td><em>Journal of Accounting and Economics</em></td>
<td>Manager decisions in companies with residual income incentive compensation plans were compared to companies not adopting a residual income-based incentive plan.</td>
<td>The results showed residual income incentive plan adopters decreased net investments via asset sales, increased share repurchase activities, and increased return on assets.</td>
</tr>
</tbody>
</table>

### EVA & HUMAN RESOURCES

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Journal/Year</th>
<th>Summary</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athanassakos (2007)</td>
<td><em>Management Decision</em></td>
<td>A survey of 288 Canadian CEOs measured the level of adoption of value-based management (VBM) analytical tools.</td>
<td>Corporate EVA adoption was 35% at the sample companies. Younger, more highly educated executives were higher adopters of VBM methods. VBM was used in determining 92% of senior executive bonus schemes and 50% of stock option awards.</td>
</tr>
<tr>
<td>Murphy (2007)</td>
<td><em>Journal of Foodservice Research</em></td>
<td>The author developed a framework to understand how to measure the economic value added (EVA) of a human resource high performance work system.</td>
<td>No empirical evidence was presented. EVA was introduced as a measurement tool in the human resource area in the hospitality industry.</td>
</tr>
<tr>
<td>Pfeiffer &amp; Schneider (2007)</td>
<td><em>Management Science</em></td>
<td>A model was developed to show WACC can be used with residual income-based compensation plans, provided the asset base is adjusted.</td>
<td>The authors stated that absent adjustments to the firm's asset base, the cost of capital must be adjusted when using residual income-based models.</td>
</tr>
</tbody>
</table>
Managers with EVA-related bonus and accounting-based bonus schemes were compared to understand if EVA incented managers performed better than managers rewarded by traditional accounting-based incentive plans.

EVA-incented managers outperformed managers on traditional incentive schemes, provided the EVA managers understood the EVA concepts.

**EVA AND THE HOSPITALITY INDUSTRY**

*Cornell Hotel and Restaurant Administration Quarterly*

Hotel asset valuation drivers were reviewed.

An early explanation using EVA in the hospitality industry was presented. EBITDA and the FFE reserve were used in adapting EVA to the lodging industry.

**Jung (2007)**
*Journal of Contemporary Hospitality Management*

EVA research was extended in the hospitality industry.

This article presented the methodology to determine ROA and WACC, and provided an example showing how a firm could apply EVA to the firm and operation unit level.

**Kefgen & Mahoney (1996)**
*Hotel Online*

An early application using EVA as an incentive compensation measure in the hospitality industry was presented.

A case study presented EVA calculations for Walt Disney Company.

**W. G. Kim (2006)**
*Journal of Hospitality & Tourism Research*

The relationship between market value and EVA was studied using data from 66 hotels and 23 restaurants.

Regression results showed EVA was not superior to traditional accounting measures in explaining hospitality company market values.

**H. Kim, Gu, & Mattila (2002)**
*Journal of Hospitality & Tourism Research*

The study explored how systemic and unsystemic risk was impacted by REIT growth and by the fixed asset nature of hotel REITs.

Results showed a positive relationship between debt ratio and beta, and the authors stated REITs using less debt experienced lower systemic risk.

**Lee & Kim (2009)**
*International Journal of Hospitality Management*

A sample of 353 hospitality firms was used to determine the relationship between six financial measures and market adjusted returns.

ROA, ROE, and CFO were compared to EVA, refined EVA (REVA), and market value added (MVA). The results showed EVA was not a good measure of firm performance.

**Lee & Upneja (2007)**
*Journal of Hospitality & Tourism Research*

Stock data from 1990-1999 was used with a residual income-based model to determine if lodging stocks were undervalued.

The results showed all stock groups were overvalued and lodging stocks were undervalued when compared to service, real estate, and other stock groups.

**EVA AS PREDICTIVE MEASURE**

**Abate, Grant, & Steward (2004)**
*Journal of Portfolio Management*

MVA and EVA-to-capital ratios were compared for top (wealth creators) and bottom (wealth destroyers) market value added (MVA) ranked companies.

The authors concluded that investors would invest in potential EVA generating companies with negative EVA versus EVA destroying companies that currently are producing positive EVA.

**Adserà & Viñolas (2003)**
*Financial Analyst's Journal*

A financial and economic value added (FEVA) model was proposed showing the individual economic and financial value drivers that impact market value.

The discounted cash flow (DCF), EVA, and Modigliani and Miller models were shown to be equivalent. Capital invested, current operating EVA, and the franchise factor were shown to be value drivers.
<table>
<thead>
<tr>
<th>Source</th>
<th>Study Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biddle, Bowen, &amp; Wallace (1999)</td>
<td>The study examined financial results for 773 firms to determine if stock market returns were more closely related to accrual earnings or to EVA.</td>
</tr>
<tr>
<td>Journal of Accounting and Economics</td>
<td>There was little evidence showing EVA was more closely associated with market returns than other financial measures.</td>
</tr>
<tr>
<td>Bacidore, Boquist, Milbourn, &amp; Thakor (1997)</td>
<td>REVA was introduced as a new EVA-related measure and tested to determine if market capitalization was related to REVA.</td>
</tr>
<tr>
<td>Financial Analysts Journal</td>
<td>The results showed an increase in EVA or REVA corresponded to an increase in market capitalization.</td>
</tr>
<tr>
<td>Lundholm (2001)</td>
<td>Discounted cash flow (DCF) and residual income (RI) models were studied to determine if they yielded the same estimates of equity values.</td>
</tr>
<tr>
<td>Contemporary Accounting Research</td>
<td>The author argued that forecasting inconsistencies, WACC errors, and missing cash flows resulted in differences in DCF and RI equity estimates. If corrected, the two models yielded the same equity value estimates.</td>
</tr>
<tr>
<td>Corderio &amp; Kent (2001)</td>
<td>EVA adopters were studied using analyst forecasts to understand the effectiveness of EVA programs on firm performance.</td>
</tr>
<tr>
<td>American Business Review</td>
<td>The regression results showed no significant relationship between the adoption of EVA and analyst forecasts.</td>
</tr>
<tr>
<td>De Villiers (1997)</td>
<td>Adjusted EVA (AEVA) was introduced as an alternate measure to EVA. AEVA was designed to be substituted for EVA when making financial decisions under inflation.</td>
</tr>
<tr>
<td>Journal of Economics and Business</td>
<td>No empirical evidence was presented. The author indicated AEVA provided a better estimate of actual profitability under inflation.</td>
</tr>
<tr>
<td>Farsio, Degel, &amp; Degner (2000)</td>
<td>The relationship between EVA and stock returns was explored.</td>
</tr>
<tr>
<td>The Financier</td>
<td>The results did not support EVA as an indicator of stock return performance.</td>
</tr>
<tr>
<td>Ferguson, Rentzler, &amp; Yu (2006)</td>
<td>Sixty-five companies were studied to determine if EVA adopters used EVA as a response to poor profitability and to understand whether EVA improved performance as measured by improved profitability.</td>
</tr>
<tr>
<td>Journal of Applied Finance</td>
<td>The study did not find sufficient evidence that underperforming companies adopt EVA or that EVA adopters experienced abnormal stock returns. The results showed profitability improved relative to peer companies after EVA adoption.</td>
</tr>
<tr>
<td>Garvey &amp; Milbourn (2000)</td>
<td>A study of 6,789 firm years explored the incremental value added by EVA and the correlation between EVA adoption and stock performance.</td>
</tr>
<tr>
<td>Journal of Accounting Research</td>
<td>The estimates of value added by EVA were found to be positive and significant.</td>
</tr>
<tr>
<td>Grant (1996)</td>
<td>Net present value of EVA was shown to be equal to the value of a company (MVA) when EVA cash flows were discounted at the WACC.</td>
</tr>
<tr>
<td>Journal of Portfolio Management</td>
<td>The introduction of the MVA- and EVA-to capital ratios extended previous research. The evidence showed MVA was significantly impacted by EVA.</td>
</tr>
<tr>
<td>Gressel (1996)</td>
<td>The steps to implement EVA and four rules for implementation were presented.</td>
</tr>
<tr>
<td>Corporate Cashflow</td>
<td>The author suggested EVA was “the best measure of growth and operating efficiency” (p.30); no empirical evidence was presented.</td>
</tr>
<tr>
<td>Journal of Applied Finance</td>
<td>The results indicated EVA adopters underperformed other firms.</td>
</tr>
<tr>
<td>Kramer &amp; Peters (2001)</td>
<td>The study measured if EVA was more suited for determining market value in high capital-intensive industries versus other industries.</td>
</tr>
<tr>
<td>Journal of Applied Finance</td>
<td>No evidence was found that showed EVA was better suited to fixed asset capital intensive companies or industries.</td>
</tr>
<tr>
<td>Author</td>
<td>Title</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Lundholm (2001)</td>
<td><em>Contemporary Accounting Research</em></td>
</tr>
<tr>
<td>Machuga, Pfeiffer, &amp; Verma (2002)</td>
<td><em>Review of Quantitative Finance and Accounting</em></td>
</tr>
<tr>
<td>Paulo (2002)</td>
<td><em>Journal of Managerial Issues</em></td>
</tr>
<tr>
<td>O’Byrne (1996)</td>
<td><em>Journal of Applied Corporate Finance</em></td>
</tr>
<tr>
<td>Rajan (2000)</td>
<td><em>Journal of Accounting Research</em></td>
</tr>
<tr>
<td>Shimin &amp; Dodd (2001)</td>
<td><em>Journal of Managerial Issues</em></td>
</tr>
<tr>
<td>Tsuji (2006)</td>
<td><em>Applied Financial Economics</em></td>
</tr>
<tr>
<td>Warr (2005)</td>
<td><em>Journal of Economics and Business</em></td>
</tr>
<tr>
<td>Yook (2004)</td>
<td><em>Quarterly Journal of Business &amp; Economics</em></td>
</tr>
<tr>
<td>Zaima (2008)</td>
<td><em>Journal of Portfolio Management</em></td>
</tr>
<tr>
<td>Stewart (2009)</td>
<td><em>Journal of Applied Corporate Finance</em></td>
</tr>
</tbody>
</table>
Table A3

*EPS to EVA Reconciliation Report—Starwood Hotels & Resorts Worldwide, Inc. ($ millions)*

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income (loss) – available for common</td>
<td>$422.00</td>
<td>$3,781.29</td>
<td>$542.00</td>
<td>$329.00</td>
</tr>
<tr>
<td>3. Eliminate surplus cash/fund required cash</td>
<td>32.66</td>
<td>20.30</td>
<td>–0.43</td>
<td>15.17</td>
</tr>
<tr>
<td>4. Eliminate other non-operating items</td>
<td>–0.06</td>
<td>23.98</td>
<td>–0.07</td>
<td>0.12</td>
</tr>
<tr>
<td>5. Convert accruals to cash</td>
<td>–6.85</td>
<td>–2.60</td>
<td>–1.34</td>
<td>–2.37</td>
</tr>
<tr>
<td>6. Capitalize and amortize intangibles</td>
<td>–3.65</td>
<td>1.61</td>
<td>–8.92</td>
<td>3.58</td>
</tr>
<tr>
<td>7. Capitalize special items</td>
<td>86.03</td>
<td>–2,511.16</td>
<td>287.30</td>
<td>263.18</td>
</tr>
<tr>
<td>8. Eliminate retirement cost distortions</td>
<td>3.83</td>
<td>4.81</td>
<td>2.03</td>
<td>–2.74</td>
</tr>
<tr>
<td>9. Eliminate stock option distortions</td>
<td>–50.00</td>
<td>2.93</td>
<td>7.18</td>
<td>8.40</td>
</tr>
<tr>
<td>10. Smooth taxes</td>
<td>15.16</td>
<td>–650.97</td>
<td>–47.81</td>
<td>–31.11</td>
</tr>
<tr>
<td>Income and capital charge adjustments</td>
<td>–521.26</td>
<td>–3,591.38</td>
<td>–58.86</td>
<td>20.35</td>
</tr>
<tr>
<td>EVA</td>
<td>–$99.26</td>
<td>$189.91</td>
<td>$483.14</td>
<td>$349.35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>$ per share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net income (loss) per share</td>
<td>$1.95</td>
</tr>
<tr>
<td>Income and capital charge adjustments per share</td>
<td>–2.41</td>
</tr>
<tr>
<td>EVA per share</td>
<td>–$0.46</td>
</tr>
</tbody>
</table>

Source: evaDimensions.
<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>$5,977.00</td>
<td>$5,979.00</td>
<td>$6,153.00</td>
<td>$5,907.00</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>-4,366.00</td>
<td>-4,345.00</td>
<td>-4,423.00</td>
<td>-4,347.00</td>
</tr>
<tr>
<td><strong>Rental expense</strong></td>
<td>464.00</td>
<td>87.00</td>
<td>96.00</td>
<td>103.00</td>
</tr>
<tr>
<td>Selling, general, &amp; adm</td>
<td>-370.00</td>
<td>-470.00</td>
<td>-513.00</td>
<td>-477.00</td>
</tr>
<tr>
<td>administrative expenses</td>
<td>-8.00</td>
<td>-1.00</td>
<td>1.00</td>
<td>-1.00</td>
</tr>
<tr>
<td><strong>Bad debt reverse accrual</strong></td>
<td>117.00</td>
<td>135.00</td>
<td>116.00</td>
<td>146.00</td>
</tr>
<tr>
<td>Reported retirement cost</td>
<td>4.00</td>
<td>5.00</td>
<td>4.00</td>
<td>6.00</td>
</tr>
<tr>
<td>- service cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-FAS123r option expense</td>
<td>-83.33</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>EBITDAR</strong></td>
<td>1,734.67</td>
<td>1,390.00</td>
<td>1,434.00</td>
<td>1,337.00</td>
</tr>
<tr>
<td>Depreciation</td>
<td>-387.00</td>
<td>-280.00</td>
<td>-280.00</td>
<td>-291.00</td>
</tr>
<tr>
<td>Rental expense</td>
<td>-464.00</td>
<td>-87.00</td>
<td>-96.00</td>
<td>-103.00</td>
</tr>
<tr>
<td>Imputed interest in rent</td>
<td>133.64</td>
<td>92.57</td>
<td>30.10</td>
<td>34.83</td>
</tr>
<tr>
<td>Amortization of finite intangibles</td>
<td>-19.00</td>
<td>-25.00</td>
<td>-26.00</td>
<td>-32.00</td>
</tr>
<tr>
<td>Amortization of ad &amp; promo</td>
<td>-115.67</td>
<td>-124.00</td>
<td>-122.67</td>
<td>-132.33</td>
</tr>
<tr>
<td><strong>NOPBT</strong></td>
<td>882.64</td>
<td>966.57</td>
<td>939.44</td>
<td>813.49</td>
</tr>
<tr>
<td><strong>NOPAT Tax</strong></td>
<td>-329.88</td>
<td>-382.35</td>
<td>-385.11</td>
<td>-332.66</td>
</tr>
<tr>
<td>Other non-operating income/(expense) after tax</td>
<td>-3.00</td>
<td>-27.00</td>
<td>-30.00</td>
<td>-45.00</td>
</tr>
<tr>
<td>Equity in earnings – Unconsolidated subsidiary</td>
<td>64.00</td>
<td>61.00</td>
<td>66.00</td>
<td>16.00</td>
</tr>
<tr>
<td>Minority interest - Income account</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Capital charge: cumulative PEB funding losses (gains) after tax</td>
<td>-0.19</td>
<td>-0.08</td>
<td>-1.44</td>
<td>-6.71</td>
</tr>
<tr>
<td><strong>NOPAT</strong></td>
<td>$613.58</td>
<td>$619.14</td>
<td>$589.89</td>
<td>$445.13</td>
</tr>
</tbody>
</table>

Source: evaDimensions.
REFERENCES


PKF Consulting. (2005). When combined, payroll and employee benefits as a percentage of total revenue have been relatively flat over the past 35 years. *Hotel & Motel Management Magazine*. Retrieved from http://findarticles.com/p/ articles/mi_m3072


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Most important, I would like to thank Lois, Patrick, and Kate. I am blessed to have such a wonderful family. Thank you for being so understanding while I selfishly pursued another life goal. There are not enough words in this, or any dissertation to describe how important you are to me.

Finally, I dedicate this dissertation to my parents who encouraged me to never stop learning.