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Authors	Moon, Joohno;Sharma, Amit
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## FACTORS INFLUENCING FIXED ASSETS INVESTMENTS IN THE U.S. HOSPITALITY INDUSTRIES

Joonho Moon and Amit Sharma

School of Hospitality Management, Pennsylvania State University, State College, PA

**ABSTRACT.** Although investments in fixed assets are important aspects of financial management, there are few studies focusing on this aspect of corporate finance in the hospitality literature. This study investigates factors that affect investment in fixed assets in both the lodging and restaurant industries. Investment in fixed assets for lodging firms was found to be negatively influenced by financial leverage; however, liquidity ratio had a positive relationship to investments. Particularly in the restaurant industry, financial leverage and firm size showed a negative relationship to investment in fixed assets, whereas profitability and liquidity ratios had a significant positive relationship with restaurant investment in fixed assets. Results of this study reemphasize that restaurants, although more profitable than lodging businesses, rely mostly on internal cash flows for their investments.

### INTRODUCTION

Hospitality firms require investment in fixed assets on a regular basis because the operations depend heavily on fixed assets, including building, equipment, and land (Combs & Ketchen, 2003; Guillet & Mattila, 2010; Oak & Dalbor, 2008a). According to Kim, Gu, and Mattila (2002), approximately \$1.4 billion were spent on real estate properties in the hospitality sector because fixed assets are what attract investors as well as customers. Moreover, such investments represent a growth opportunity because of hospitality firms' fixed-assets-intensive nature (Dalbor & Upneja, 2004; Oak & Dalbor, 2008b; Pine & Phillips, 2005). That is, poor investments in fixed assets can be associated with lower revenues. Sharma and Upneja (2005) demonstrated that low investment in fixed assets negatively influences hospitality firms' performance. However, Kim and Gu (2006) and Gu (2002) found a positive relationship between investment in fixed assets and the likelihood of bankruptcy. It suggests that it is crucial that we gain a better understanding of the characteristics of invest-

ment in fixed assets in the hospitality industries because hospitality firms' fixed assets could affect both the enhancement of organizational performance and likelihood of bankruptcy (Ottenbacher, Harrington, & Parsa, 2009).

The critical factors that drive investments in fixed assets are liquidity and profitability. Prior studies have illustrated the effects of these factors on fixed-assets investments. For instance, Cleary (1999) focused on liquidity-related items including cash flow and current ratios to predict investment in fixed assets. Perotti and Gelfer (2001) used firm profitability to predict investment in fixed assets. In restaurants, Upneja and Sharma (2009) highlighted the importance of liquidity in predicting investment in fixed assets. These studies focused on each of these attributes separately, despite the importance of investigating the effect of both factors on the prediction of investment at the same time (Campello, Giambona, Graham, & Harvey, 2012; Cleary, 1999; Upneja and Sharma, 2009). Our study thus aims to fill a gap in the literature by combining both liquidity and

profitability in the prediction of investment in fixed assets in the restaurant and lodging industries. In doing so, this research compares investment in fixed assets in these two industries, along with the magnitude and direction of underlying relationships. The current study thus investigated the relationship between firms' investment in fixed assets as a dependent variable, and liquidity and profitability as main determinants.

Kang, Lee, and Huh (2010) and Inoue and Lee (2011) illustrated that lodging firms depend more on debt financing than do restaurant firms, whereas restaurant firms exhibit higher operating performance measured with return on assets (ROA). Given the differences, it is anticipated that the determinants of investment in fixed assets appear in different ways. Moreover, financial conditions such as firm size and financial leverage were used as control variables because the two attributes represent the capability and capital structure of a company. By doing so, this study attempted to acquire a more robust prediction on investment in fixed assets. Overall, the purpose of this study was to investigate whether investments in fixed assets were affected by both liquidity and profitability when firm size and financial leverage are controlled.

## THEORETICAL FOUNDATION AND LITERATURE REVIEW

### Portfolio Theory to Property Management

Portfolio theory provides the theoretical background on the prediction of investment in fixed assets. According to the portfolio theory, combination of securities and assets enables investors to acquire the maximum return by mitigation of risk (Hogan, 1994; Markowitz, 1952). Because a business resource is constrained, inappropriate resource allocations give rise to high operational risk (Hsu & Jang, 2009; Koberg, 1987). Financial portfolio theory thus emphasizes the optimal resource allocation using diversification. Considering the characteristics of hospitality businesses, facility

management affects the quality of service (Lee & Jang, 2013; Shanka & Taylor, 2004). Hence, managers focus on how to administrate their business portfolio in their property management because investment in fixed assets (e.g., buildings and equipment) plays a pivotal role for the success of business.

Previous studies verified that poor investments in fixed assets are linked with poor organizational performance (Sharma & Upneja, 2005). Kim and Gu (2006) and Gu (2002) demonstrated that inappropriate investment in fixed assets is associated with the higher likelihood of business failure. For instance, if managers implement excessive investment in fixed assets, their businesses are more likely to be under financial distress due to the lack of resources for other operations (e.g., labor and inventories costs). It indicates that businesses are less likely to accomplish the optimal resource allocation without reliable information. Managers thus attempt to maintain appropriate business portfolios for the management of fixed assets given their financial conditions. Recently, Lee and Jang (2013) employed the portfolio theory to build the theoretical background for the prediction of investment in fixed assets in the context of the lodging industry. They claimed that the role of asset managers is equivalent with the portfolio manager in the hospitality business. That is, if they build a poor portfolio and fail to manage their fixed assets, the businesses are more likely to lose their sales.

### Investment in Fixed Assets and Liquidity

Management is responsible for continued investments in a firm's assets. However, management may shirk responsibility or make investment decisions that are not aligned with the interests of shareholders, causing agency problems (Myers, 1977). Agency theory argues that managers tend to avoid responsible work to protect their compensation and perks—this incurs monitoring costs for shareholders to prevent moral hazard and adverse selection of investment (Jensen & Meckling, 1976; Myers, 1977). Agency problems are caused mainly by asymmetric information (Akerlof, 1970; Roh,

1996). Earlier research argued that a firm's capital structure and the value of a firm were irrelevant under certain conditions, including no information asymmetry, taxation and bankruptcy costs (Modigliani & Miller, 1958). Myers and Majluf (1984), Myers (1977), and Dalbor and Upneja (2004) highlighted the distortions that affect the decision of investments given the capital structure because of the degree of information asymmetry. Hence, capital structure offers crucial information for decision making about how to implement financing because resources are depleted by the cost of capital in different ways.

Titman and Wessels (1988) and Ramirez (2012) asserted that financing problems are mitigated by maintaining sound liquidity condition. Cleary (1999, 2006) and Dittmar and Mahrt-Smith (2007) also emphasized sound liquidity because it alleviates concerns of creditors and shareholders. Liquidity refers a debtor's ability to pay short-term debts that mature within a year (Bekaert, Harvey, & Lundblad, 2007; Borde, 1998; Jensen, 1984; Kim, Mauer, & Sherman, 1998). Tirole (2006) defined liquidity as the ability of a firm to pay its short-term obligation. Scholars addressed that poor liquidity causes the lower capability of investments in fixed assets (Allen Qian, & Qian, 2005; Bloomfield & Wilks, 2000; Brockman & Chung, 2003; Miller & Rock, 1985). Numerous studies thus have asserted the importance of liquidity for the prediction of investment in fixed assets. For example, Arena and Julio (2011) claimed that cash is critical in management because it mitigates risk, and Campello et al. (2012) showed that liquidity is essential in coping with economic crisis by using European companies as a study sample. Fazzari, Hubbard, and Peterson (1988) and Cleary (1999) also found that investment is sensitive to internal cash flows. In addition, previous studies demonstrated that sound liquidity is an instrument to maintain a certain level of investments (Flor & Hirth, 2013; Froot, Scharfstein, & Stein 1993; Kaplan & Zingales, 1997; Riddiough & Wu, 2009; Yan, 2008).

Research so far indicates that financial liquidity plays a crucial role in predicting firms'

investment in fixed assets. Amihud and Mendelson (1991) also confirmed the positive relationship between investment and financial liquidity. Munoz (2012) found an empirically positive association between investment in fixed assets and financial liquidity. The relationship was also proven by Volchkova (2009) and Aivazian, Ge, and Qiu (2005) presenting a significant and positive link between investment in fixed assets and cash flow. Upneja and Sharma (2009) disclosed a positive relationship between liquidity and investment in the restaurant industry. Based on the literature review, this study proposes the following hypotheses:

- H<sub>1a</sub>: Investment in fixed assets has a positive linear relationship with liquidity in lodging firms.
- H<sub>1b</sub>: Investment in fixed assets has a positive linear relationship with liquidity in restaurant firms.

### Investment in Fixed Assets and Profitability

Profitability is a measure of a firm's capacity to generate net income in a given period (Schmidgall, 2009). Gompers, Ishii, and Metrick (2003) demonstrated that ROA represents a proxy of profitability. Scholars emphasized profitability as an internal source of financing for investment in fixed assets (Gompers, 1995; Gu, 1994; Lubos & Stambaugh, 2003; Skalpe, 2003). A number of empirical studies have demonstrated the positive relationship between ROA and investment in fixed assets because higher ROA enables businesses to possess abundant resource. According to Denis (1994), there is a positive relationship between profitability and amount of investment in fixed assets. Fama and French (2000), Firth, Malatesta, Xin, and Xu (2012), and Cho (1998) showed that higher profitability leads to higher expected rates of investment. Moreover, Eriotis, Frangouli, and Ventoura (2002) found a positive association between profit margin, another measure of profitability, and the level of investment in fixed assets. Orhangazi (2008) used three decades of U.S. economy data and

found that more profitable organizations are more likely to invest. Given the empirical evidence, this research proposes the following research hypotheses:

- H<sub>2a</sub>: Investment in fixed assets has a positive linear relationship with profitability in lodging firms.
- H<sub>2b</sub>: Investment in fixed assets has a positive linear relationship with profitability in restaurant firms.

Hospitality studies have noted the differences in financial characteristics of the restaurant and lodging industries. For example, Kang et al. (2010) and Inoue and Lee (2011) found that restaurant firms have the greater profitability than lodging firms. Oak, Hua, and Dalbor (2012) demonstrated that ROA work as significant predictors of dividend initiation in the context of the restaurant industry. Kim and Jang (2010) also revealed the positive association between dividend initiation and ROA by employing publicly traded lodging firms in the U.S. market. Given the higher ROA of restaurant firms, the magnitude of ROA for the prediction of investment in fixed assets of restaurant firms is likely to be greater than the magnitude of lodging firms.

Kim, Kim, and Gu (2012) and Gu and Kim (2002) showed that financial liquidity appears as a more critical predictor of systematic risk in the restaurant industry, whereas liquidity appeared as a nonsignificant predictor in the lodging industry. Kim, Kim, and Woods (2011) also presented that restaurant businesses holding fertile cash flow are associated with the higher likelihood of investment. Moreover, Kim and Ayoun (2005) depicted that lodging firms' debt-to-assets ratio is greater than that of restaurant firms. It indicates that the liquidity of lodging firms is more volatile than the liquidity of restaurant firms because high debt ratios are likely to lower liquidity ratio. Hence, liquidity is likely to work as a more important determinant of investment in fixed assets in the restaurant business sector than in the lodging business sector. Given the evidence about the prediction of liquidity, this study anticipated that there would be a

difference in the prediction of investment in fixed assets between the restaurant and lodging industries. Therefore, this study proposes the third set of hypotheses as follows:

- H<sub>3</sub>: There is a significant difference in predicting the investment in fixed assets between lodging and restaurant industries' liquidity and profitability.
- H<sub>3a</sub>: Liquidity will more strongly predict investments in fixed assets in the restaurant industry than in the lodging industry.
- H<sub>3b</sub>: Profitability will more strongly predict investments in fixed assets in the restaurant industry than in the lodging industry.

## METHOD

### Data and Variables

The sample organizations adopted in this study were 23 publicly held lodging companies and 69 publicly held restaurant companies. Financial data were collected from the National Association of Securities Dealers Automated Quotations (NASDAQ)<sup>1</sup> and the New York Stock Exchange (NYSE).<sup>2</sup> COMPUSTAT was employed to acquire financial information using standard industry classification code for lodging (7011) and restaurant (5812). The study period was 2000–2010. Panel data were created as an unbalanced format in both datasets. Cook's distance was estimated to detect and eliminate outliers with the cut-off value of 1 (Hair, Black, Babin, Anderson, & Tatham 2009). A total of 26 (restaurant) and 11 (lodging) outliers were detected and eliminated from the restaurant and lodging samples, respectively. A total of 527 observations were used for restaurants, whereas 210 observations were employed for lodgings.

According to Graham (2004), investment refers to allocating funds for the purpose of financial gain on the assets (e.g., land, building,

<sup>1</sup><http://www.nasdaq.com>

<sup>2</sup><http://www.nyse.com>

equipment, and inventories). Among the investments in diverse assets, this study focuses on the investment in fixed assets, which include building and equipment in a given period. This study thus measured proxy investment in fixed assets based on previous studies in the following way (Cleary, 1999, 2006; Upneja & Sharma, 2009):

$$\text{Investment (INV}_t) = \frac{I_t}{K_{t-1}},$$

where  $I_t$  is an investment in building and equipment during period  $t$ ,  $K_{t-1}$  is the beginning-of-period book value for net property, plant, and equipment during period  $t-1$ , the variable  $I$  represents investment in fixed assets, and the variable  $K$  represents the beginning-of-period net fixed assets.

Current ratio is a representative instrument to measure financial liquidity (Shleifer & Vishny, 1992). Liquidity refers to an organization's capability to pay short-term obligations that mature within 1 year (Andrew, Damitio, & Schmidgall, 2007). This study adopted current ratio to measure liquidity.

Current Assets (CA) to Current Liabilities (CL)

= Current Assets/Current Liabilities.

The most common measure of financial performance is ROA, which is regarded as a representative performance indicator by the U. S. investment managers (Coval & Moskowitz, 1999). ROA is computed by dividing net income by average total assets. ROA measures a company's ability to turn assets into profit; this ratio informs profitability by comparing

bottom-line profits to total assets (Andrew et al., 2007; Fama and French, 2001, 2006). The following formula was used to compute the ROA in this research:

Return on Assets (ROA)

= Net Income/Average Total Assets.x

Firm size is considered as a control variable because larger firms benefit from economies of scale (Hsu & Jang, 2009). Kim and Jang (2010) and Fama and French (2001) found that earnings from larger firms are more stable and consistent. Because large firms save more costs from labor and promotions with the economies of scale, they are more likely to implement more resource allocation for their assets (Benston, 1965). Financial leverage is defined as a process of striking a balance between debt and assets (Kim et al., 2012). Because financial leverage influences financial risk, such as bankruptcy costs, it should be controlled in the prediction of investment in fixed assets (Jensen, 1984; Modigliani & Miller, 1958; Whited, 1992). Dalbor and Upneja (2002, 2004) emphasized the importance of financial leverage to predict financial decision making—the more debt that is incurred by a company, the greater its risk, such as bankruptcy costs. Table 1 presents the illustration of variables used in this study.

### Statistical Analysis

This study performed independent  $t$ -tests to check the groups' mean differences of financial attributes between the lodging and restaurant industries. A natural log transformation was conducted for total assets and

TABLE 1. Measurement of Variables

Variables	Description
Investment (INV)	$I_t/K_t - 1$
Liquidity (LIQ)	Current Assets/Current Liabilities
Return on Assets (ROA)	Net Income/Average Total Assets
Leverage (DEBT)	Total Liabilities/Total Owners Equity
Firm Size (SIZE)	Total Assets
Lodging Dummy (LD)	Dummy Variable: 1 = lodging firms, 0 = restaurant firms

Note.  $I$  = Investment in building and equipment during period,  $K$  = The beginning-of-period book value for net property, plant, and equipment.

financial leverage to obtain heteroscedasticity-corrected standard error and normality (Gujarati & Porter, 2009; Hair et al., 2009). Because financial leverage is denoted as a ratio, integer 1 was incorporated into the natural log transformation to prevent missing data (Greene, 2006). The Breusch and Pagan Lagrangian Multiplier test was implemented to choose an appropriate model between a random-effect model, which incorporates the unobserved effect into the model to minimize omitted variable bias, and the pooled ordinary least squares (OLS) model by comparing the residual (Wooldridge, 2009). The Lagrangian multiplier (LM) value was 2.45 ( $p = .231$ ) in the case of the lodging industry data. This indicated that pooled OLS was more appropriate in modeling. On the other hand, LM statistics were significant for the restaurant industry ( $\chi^2 = 25.29$ ,  $p < .01$ ). This is the evidence that the random-effect model was more appropriate in the case of restaurants than pooled OLS. In addition, the Hausman test was implemented to identify a more appropriate model between the random-effect model and the fixed-effect model, which attempts to control for time effect and firm effect using a binary variable based on the significance of the covariance between exogenous variables and residual (Nickell, 1981; Wooldridge, 2009). These results were consistent with the LM criteria; results indicated a preference for the random-effect model over the fixed-effect model for the data of restaurant firms ( $\chi^2 = 12.57$ ,  $p = .121$ ).

Restaurant and lodging firms data were modeled together and the lodging dummy variable was used to identify industry differences. The Chow-test is frequently used by comparing the sum of squared residuals as an econometric method to identify whether coefficients in two linear regressions on different datasets are equal (Wooldridge, 2009). Hence, the Chow test was implemented to determine whether structural changes influenced the estimations. The test statistics revealed significance ( $\chi^2 = 53.73$ ,  $p < .01$ ). It suggested that interactions with lodging dummy variables were necessary in the

modeling. For the pooled data models, the LM test was significant ( $\chi^2 = 37.24$ ,  $p < .01$ ) and the Hausman test was significant ( $\chi^2 = 25.81$ ,  $p < .05$ ). Consequently, a pooled (lodging firms and restaurant firms) dataset was analyzed using a fixed-effect model. Moreover, this study needed to employ a two-way model that considers time effect and firm effect together to give the characteristics of panel data (Gujarati & Porter, 2009; Wooldridge, 2009). This research also implemented the Wooldridge test for autocorrelation for the detection of the autocorrelations in each model (Wooldridge, 2009). Every test statistic showed the nonsignificance, which indicates that an autoregressive regression model was not necessary. In order to test the first and second hypotheses, the following regression equation was used:

$$\begin{aligned} \text{INV}_t = & \beta_0 + \beta_1 \ln(\text{SIZE}_t) + \beta_2 \ln(1 + \text{DEBT}_t) \\ & + \beta_3 \text{LIQ}_t + \beta_4 \text{ROA}_t + \varepsilon. \end{aligned}$$

The following model was used to test the third hypothesis:

$$\begin{aligned} \text{INV}_t = & \beta_0 + \beta_1 \ln(\text{SIZE}_t) + \beta_2 \ln(1 + \text{DEBT}_t) \\ & + \beta_3 \text{LIQ}_t + \beta_4 \text{ROA}_t \\ & + \beta_5 \text{LD} + \beta_6 \text{LD}^* \ln(\text{SIZE}_t) \\ & + \beta_7 \text{LD}^* \ln(1 + \text{DEBT}_t) + \beta_8 \text{LD}^* \text{LIQ}_t \\ & + \beta_9 \text{LD}^* \text{ROA}_t + \varepsilon, \end{aligned}$$

where Investment (INV) was defined as current year investment/capital stock in the previous year. Liquidity (LIQ) was calculated as current assets/current liabilities. Return on Assets (ROA) was net income/average total assets and financial leverage (DEBT) was calculated as total liabilities/total owners equity. Total assets were used as a proxy of firm size (SIZE). Lodging dummy (LD) variable was also included and coded as follows: 1 = lodging firms; 0 = restaurant firms.

**RESULTS**

Table 2 presents the descriptive statistics for restaurant and lodging firms. Although lodging firms' INV showed a mean value of 0.936 and a standard deviation of 0.352, restaurant firms' INV had a mean value of 0.925 and a standard deviation of 0.462. In terms of LIQ, lodging firms (mean = 1.424; SD = 1.184) had better liquidity than restaurant firms (mean = 1.037; SD = 0.871). With regard to SIZE and DEBT, not only were lodging firms' size larger in the values of SIZE (mean = \$3,001 [in millions]; SD = \$3,793 [in millions]) than restaurant firms (mean = \$1,230 [in millions]; SD = \$3,814 [in millions]), but also DEBT for lodging firms (mean = 2.741; SD = 4.635) was greater than it was for restaurant firms (mean = 0.311; SD = 28.394). It informs us that lodging firms depended more on debt financing and have larger organization size.

Table 3 illustrates the results of the independent t-test. There was no significant difference between lodging and restaurant industries in terms of INV. Other than DEBT, all independent variables showed significant differences (mean difference = 1.051;  $p = .294$ ). Lodging firms had higher LIQ (mean difference = 3.762;  $p < .01$ ) and larger SIZE (mean difference = \$5,080 [in millions];  $p < .01$ ). This indicates that lodging firms appeared as more liquid and larger in their

**TABLE 2.** Descriptive Statistics (Restaurant  $N = 527$ , Lodging  $N = 210$ )

	INV	LIQ	ROA(%)	SIZE (Millions of \$)	DEBT
<b>Mean</b>					
Lodging	0.936	1.424	1.586	3,001	2.741
Restaurant	0.925	1.037	3.762	1,230	0.311
<b>SD</b>					
Lodging	0.352	1.184	9.235	3,793	4.635
Restaurant	0.462	0.871	10.503	3,814	28.394

Note. Investment (INV) = Investment in building and equipment during period t/The beginning-of-period book value for net property, plant, and equipment during period  $t - 1$ , Liquidity (LIQ) = Current Assets/Current Liabilities, Return on Assets (ROA) = Net Income/Average Total Assets, Leverage (DEBT) = Total Liabilities/Total Owners Equity, Firm Size (SIZE) = Total Assets.

**TABLE 3.** Difference in Variables Between Lodging and Restaurant Industries (Independent t-Test; Restaurant  $N = 527$ , Lodging  $N = 210$ )

Variables	Lodging	Restaurant	Mean Difference	t-Stat	Sig
INV	.936	.925	.011	.326	.744
LIQ	1.424	1.037	.387	3.762	.000
ROA (%)	1.586	3.761	-2.176	-2.475	.014
SIZE	3,001	1,230	1,771	5.080	.000
DEBT	2.741	.311	2.430	1.051	.294

Note. Investment (INV) = Investment in building and equipment during period t/The beginning-of-period book value for net property, plant, and equipment during period  $t - 1$ , Liquidity (LIQ) = Current Assets/Current Liabilities, Return on Assets (ROA) = Net Income/Average Total Assets, Leverage (DEBT) = Total Liabilities/Total Owners Equity, Firm Size (SIZE) = Total Assets.

organizational size. On the other hand, restaurant firms had higher ROA than lodging firms (mean difference = -2.475;  $p < .05$ ).

Table 4 exhibits correlation coefficients for research variables of the lodging and restaurant. The results of the below diagonal show significant correlations between INV and LIQ ( $r = .6267$ ,  $p \leq .01$ ), and SIZE and INV ( $r = -.1681$ ,  $p \leq .05$ ) for the lodging companies. This indicates that liquidity is a possible predictor of INV. ROA and SIZE ( $r = .1635$ ,  $p \leq .01$ ) were positively correlated. On the other hand, SIZE and LIQ ( $r = -.1674$ ,  $p \leq .01$ ) were negatively correlated in lodging firms. The results of the above diagonal also provide

**TABLE 4.** Correlations Between Variables for Lodging Firms (Restaurant  $N = 527$ , Lodging  $N = 210$ )

	1	2	3	4	5
<b>1. INV</b>	1	.1661**	.7971**	-.0103	-.0297
<b>2. ROA</b>	.1191	1	.1240**	-.0153	.1532*
<b>3. LIQ</b>	.6267**	.0811	1	-.0009	-.0208
<b>4. DEBT</b>	-.1431	.0414	.0008	1	.0122
<b>5. SIZE</b>	-.1681*	.1635*	-.1674*	.2366**	1

Note. Investment (INV) = Investment in building and equipment during period t/The beginning-of-period book value for net property, plant, and equipment during period  $t - 1$ , Liquidity (LIQ) = Current Assets/Current Liabilities, Return on Assets (ROA) = Net Income/Average Total Assets, Leverage (DEBT) = Total Liabilities/Total Owners Equity, Firm Size (SIZE) = Total Assets.

Two-tailed tests; \* $p \leq .05$ , \*\* $p \leq .01$ . Below diagonal is the case of lodging firms and above diagonal is the case of restaurant firms.

TABLE 5. Result of Regression Pooled Model in Both Lodging and Restaurant Industries (Restaurant  $N = 527$ , Lodging  $N = 210$ )

Variables	Model 1 Coefficient (Wald) (Two-way R.E.)	Model 2 Coefficient (t-stat) (Pooled OLS)	Model 3 Coefficient (t-stat) (Two-way F.E.)
Intercept	.4549 (18.83)**	.4797 (6.83)**	.8547 (3.61)**
DEBT	-.0210 (-2.56)**	-.0599 (-3.66)**	-.0036 (-0.11)
SIZE	-.0071 (-2.24)*	.0079 (0.91)	-.0378 (0.87)
LIQ	.3638 (24.64)**	.2480 (8.80)**	.4029 (19.70)**
ROA	.1534 (3.72)**	-.0158 (-0.60)	.3701 (1.99)*
LD			-.0445(-1.12)
LD*DEBT			-.0651(-1.11)
LD*SIZE			.3167(3.54)**
LD*LIQ			-.2141(-5.61)**
LD*ROA			-.2388(-0.57)
R <sup>2</sup>	.3219	.2240	.4438
Wald $\chi^2$	820.81**		
F-statistics		100.84**	1881.11**

Note. R.E. = random effect, OLS = ordinary least squares, F.E. = fixed effect. Investment (INV) is dependent variable, Model 1 is for restaurant firms, Model 2 is for lodging firms, and Model 3 is for lodging and restaurant firms; Investment (INV) = Investment in building and equipment during period  $t$ /The beginning-of-period book value for net property, plant, and equipment during period  $t-1$ , Liquidity (LIQ) = Current Assets/Current Liabilities, Return on Assets (ROA) = Net Income/Average Total Assets, Leverage (DEBT) = Total Liabilities/Total Owners Equity, Firm Size (SIZE) = Total Assets, Lodging Dummy (LD) = Dummy variable: 1 = lodging firms; 0 = restaurant firms, Two-tailed tests; \* $p \leq .05$ , \*\* $p \leq .01$ ; Wooldridge test for autocorrelation: Model 1  $F$ -statistics = 0.457 ( $p = 0.532$ ), Model 2  $F$ -statistics = 0.237 ( $p = 0.649$ ), and Model 3  $F$ -statistics = 1.256 ( $p = 0.171$ )

support for the significant correlation between INV and ROA ( $r = .1661$ ,  $p \leq .01$ ), and INV and LIQ ( $r = .7971$ ,  $p \leq .01$ ) for the restaurant companies. LIQ and ROA ( $r = .1240$ ,  $p \leq .01$ ) showed a significantly positive correlation. SIZE and ROA ( $r = .2543$ ,  $p \leq .05$ ) revealed a significantly positive correlation for restaurant firms.

R-square value indicates that the explanatory variables accounted for 32.19% of variance in INV (see Table 5). The model was statistically significant based on Wald Chi-squared statistics (Wald Chi-squared = 820.81;  $p < .01$ ). Variation inflation factors value ( $VIF < 3$ ) suggested that the explanatory variables were less likely to suffer from multicollinearity (Greene, 2006; Wooldridge, 2009). In the case of restaurant firms, LIQ measured by the current ratio ( $\beta = .3638$ ;  $p < .01$ ) and ROA ( $\beta = .1514$ ;  $p < .01$ ) had a positive linear relationship with the INV. On the other hand, larger SIZE ( $\beta = -.0071$ ;  $p < .05$ ) and DEBT ( $\beta = -.0210$ ;  $p < .01$ ) showed a significantly negative linear relationship with INV. This indicates that profitability and liquidity had a positive impact on investments of restaurant firms. In contrast, financial leverage had a

negative impact on investments of restaurant firms. Consequently, the first and second hypotheses were supported in the case of the restaurant industry.

R-square value for the lodging industry was .2240. The model was statistically significant according to  $F$ -statistics ( $F = 100.84$ ;  $p < .01$ ). The model was also less likely to be impaired by multicollinearity, given that VIF values were less than 3 (Greene, 2006; Wooldridge, 2009). There was a significant positive relationship between LIQ and lodging INV ( $\beta = .2480$ ;  $p < .01$ ). In contrast, DEBT ( $\beta = -.0599$ ;  $p < .01$ ) had a significant negative impact on lodging INV; however, SIZE and ROA did not show statistical significance. Consequently, only the first hypothesis was supported in the lodging industry case.

Table 5 also presents the results of the regression model for pooling both lodging and restaurant companies. The model was statistically significant given the  $F$ -statistics ( $F = 1881.11$ ;  $p < .01$ ). With regard to the results of restaurant firms, there was a significant positive relationship between LIQ and INV ( $\beta = .4029$ ;  $p < .01$ ). This designates that better liquidity facilitates investment in

fixed assets. ROA showed significant and positive coefficient for the prediction of INV ( $\beta = .3701$ ;  $p < .05$ ). The LD was not significant. Interaction of LD and LIQ showed a significant negative relationship ( $\beta = -.2388$ ;  $p < .01$ ). This informed us that the magnitude of liquidity was lower in the lodging industry than in the restaurant industry. In the pooled case, the third hypothesis was partially supported.

## DISCUSSION

Current research investigates the factors that could predict investment in fixed assets in the lodging and restaurant industries. The main attributes investigated in this research to predict investments in fixed assets were liquidity and ROA. The analysis controlled for firm size and financial leverage. Panel regressions were employed for analysis, given the characteristics of panel data. Results of the Hausman test and the Breusch and Pagan Lagrangian Multiplier tests indicate that the random-effect model is a better model for predicting investment in fixed assets in the case of restaurant firms, whereas pooled OLS is better when we analyze the data of lodging firms (Gujarati & Porter, 2009; Wooldridge, 2009).

The results show that there is a significantly positive relationship between liquidity and investment in fixed assets in both industries. It suggests that liquidity measured by current ratio would be a crucial predictor of investment in fixed assets. Hence, managers need to focus on liquidity-related accounting items, such as cash, accounts receivable, and accounts payable for the more stable and consistent investment in their fixed assets. By doing so, firms could increase the likelihood of investing in fixed assets. Such investments could become drivers on the growth of firm and growth in its future revenues. The coefficient of ROA for the prediction of investment in fixed assets was also significant and positive in the restaurant industry. Hence, restaurant managers must simultaneously focus on improving the management of short-term assets and liabilities as well as ROA, through both maximizing revenue

and effective cost control, if they desire to facilitate investment in fixed assets.

The descriptive statistics presented that debt financing was lower and ROA was higher in restaurant firms than lodging firms. This suggests that restaurant firms were more constrained to access external funds. Restaurant firms were thus more likely than lodging firms to rely on internal financing rather than external financing, as the pecking order theory asserted (Myers, 1984). Therefore, restaurant firms must maintain sound liquidity and profitability to maintain appropriate amounts of investments in fixed assets. This further accounts for why restaurant firms' liquidity and profitability were stronger predictors of investment in fixed assets based on each industry's capital structure. Results shown in Table 5 support this finding by presenting greater magnitude of liquidity for restaurant companies than for lodging companies.

This study produced several contributions to the hospitality finance literature. According to Jang and Park (2011), only three investment-related studies have been conducted in the last two decades on hospitality and tourism. Moreover, few hospitality studies have adopted the panel regression model despite the fact that panel data are a crucial aspect of obtaining more robust estimators because future and past performance can influence each other (Jang & Park, 2011; Wooldridge, 2009). Hence, this study contributes not only to understanding the relationship between investment in fixed assets and financial attributes further, but also to accomplishing more robust and generalizable estimations.

Furthermore, the results are externally validated by prior works. Cleary (1999) noted that cash flow is crucial to predicting investment in fixed assets. Results of this study support the results of previous literature given the point that both industries revealed significant and positive relationship between liquidity and investment in fixed assets. In terms of profitability, this study also confirms Perotti and Gelfer's (2001) results, which disclosed a positive and significant relationship between ROA and investment. Regarding the literature

in hospitality, our results are externally validated by those of Upneja and Sharma (2009). Specifically, liquidity estimations were in the same direction in predicting investment in the case of the restaurant industry.

### LIMITATIONS

Future studies can build on this work by further strengthening analysis. First, data used in this study included information only for publicly traded companies, even though several major companies (at the time of this study) were not traded on the stock market, such as Hilton Hotel and Resorts and Subway. Moreover, private hospitality firms are likely to appear in different ways for their investment in their fixed assets because private firms are more likely to be constrained in terms of their financing sources. Second, the employed sample was mainly restricted to the U.S. firms, which indicates that the results are less generalizable to account for global hospitality firms' behavior in terms of investment in fixed assets. Therefore, the sample could be enhanced in future studies by considering either international companies or private companies. Finally, future research could consider more aspects that are unique in these sectors as better predictors for investment in fixed assets, such as franchising. Franchising is a popular business strategy in both industries. If future research conducts the replicated work by incorporating franchising, it is expected that organizations adopting franchising are more likely to invest in fixed assets because franchising enables firms to be less restricted by resource constraint given the argument of resource scarcity theory (Castro-giovanni, Combs, & Justis 2006; Combs & Ketchen, 2003; Hsu & Jang, 2009). Hence, it would be valuable to examine the effect of franchising for the prediction of investment in fixed assets as a subject of future research.

### AUTHOR NOTES

Joonho Moon is a PhD student at the School of Hospitality Management, Pennsylva-

nia State University. Amit Sharma is an Associate Professor at the School of Hospitality Management, Pennsylvania State University.

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