AN EXAMINATION OF THE SYSTEMATIC RISK DETERMINANTS OF THE CASINO INDUSTRY

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DETERMINANTS OF THE CASINO INDUSTRY

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To my parents Yongsik Shin and Yangsoo Park

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CHAPTER I

INTRODUCTION

1. Background of the Casino Industry

The casino industry has grown over the years. The industry has spread from Nevada and New Jersey to many other states. Four hundred and sixty seven commercial casinos are in operation in 12 states throughout the United States in 2008. Moreover, 424 of Native American casinos are also spread out in 29 states (American Gaming Association, 2008). As seen in Appendix A, people spent $17.1 billion on commercial casinos in 1996. However, gaming revenue has almost doubled in 10 years. In 2006, $32.42 billion was spent in commercial casinos, a 6.8% increase from the previous year. Every state with commercial casinos experienced increases from at least 3.5%; Colorado, to 15.1%; Louisiana (Appendix B). Consequently, the number of employees of the casino industry has risen as well. From 1990 to 2005, the number of hired people has steadily risen about 80% (American Gaming Association, 2008).

There are several reasons for steady growth of the casino industry. According to the American Gaming Association (2007), not only are the casinos continuing to expand in commercial gaming states, but also casinos on the Gulf Coast recovering from Hurricanes Katrina and Rita have contributed to the marked growth from 2005 to 2006. Furthermore, commercial casinos have kept renovating and improving their existing properties over the years to attract customers (American Gaming Association, 2007).

Moreover, Eighty-two % of Americans generally think casino gambling is acceptable for them or other people (American Gaming Association, 2007). Almost 90% of them also believe people should be able to spend disposable income in a casino if they want (American Gaming Association, 2007).

However, investments in the casino industry have also been considered risky even though the casino industry is booming continuously. Gu and Kim (1998) mentioned that casino stocks were generally believed to be risky due to the large variation in their prices compared to the U.S. market. Moreover, the casino stock market was found out to be more unstable than the U.S.A. stock market indices from 1973 through 1992 according to Goodall (1994). Likewise, competition is becoming stiffer among casinos due to the increasing number of casinos, namely Native American Casinos. The Trump casino, which filed the second bankruptcy in 2004 after 1991, could be an example of major casino bankruptcy. Furthermore, gaming revenues have recently gone down for two straight months and casinos in Las Vegas, Nevada started offering summer discount deals earlier than usual (Audi, 2008).

As seen above, investments in the casino industry are a good idea since it is continuously growing and booming, but it is considered risky at the same time. Therefore, it is important for casino managers and potential investors to determine the casino's risk from its financial characteristics and find out whether the investment is risky or not.

Financial approach of predicting risk has been a popular method in the hospitality industry. Some researchers have studied the relationships between financial variables such as return on assets (ROA), debt to equity (DE), quick ratio (QR), and risk, and then tried to predict risk by analyzing the financial variables. In this method, Kim, Gu, and

Mattila (2002) studied the hotel industry and Lee and Jang (2007) investigated the airline industry. Furthermore, Borde (1998), Gu and Kim (2002), and Kim, Ryan, and Ceschini (2007) studied the restaurant industry. Gu and Kim (1998) examined the casino industry regarding this topic. The variables used as determinants of systematic risk in the previous study of the casino industry (Gu and Kim, 1998) were liquidity, leverage, profitability, and, efficiency. This study will use the same variables as Gu and Kim's study (1998) but will add one more financial variable, growth rate, which is widely used as an important financial determinant in the studies in the other industries.

2. Statement of the Problem

Although previous researchers have tried to determine relationships between risk and financial variables in the hospitality industry (Borde, 1998; Gu and Kim, 1998; Gu and Kim, 2002; Kim, Gu, and Mattila, 2002; Kim, Ryan, and Ceschini, 2007; Lee and Jang, 2007), their findings were quite different. That is, those studies had mixed results, and there were still unclear conclusions about which specific financial variables were the determinants on risk.

Moreover, findings of previous studies were based on outdated financial data. Especially, Kim and Gu (1998) investigated the casino industry using data from 1992 through 1994. Researchers are not sure if that information was still effective in the recent casino industry.

Studies regarding this subject in the casino industry have not been conducted enough compared to the other fields in the hospitality industry such as the restaurant industry.

3. Purpose of the Study

The main purpose of this study is to identify which specific financial characteristics are the determinants of systematic risk in the casino industry, and use the results to help casino managers and investors more clearly understand the nature of risk in the casino industry. Another purpose of this research is to stimulate further research about systematic risk analysis in the hospitality industry by exploring various research methods.

4. Significance of the Study

Recent casino industry is changing rapidly and becoming more competitive. Therefore, it is very important for casino managers and investors to predict risk in various ways. Gu (2002) mentioned that bankruptcy does not happen immediately and could be predicted in advance by analyzing financial ratios. Therefore, it is important to understand which financial variables are highly related to the firm's risk.

The researcher hopes that casino managers and investors will be able to analyze future risk by using this study.

In addition, this study should give more accurate information to both casino managers and investors in the changing industry by using the most recent financial data available, from 2002 through 2006.

Lastly, the second part of methodology is a different approach to a systematic risk analysis, considering traditional risk analysis studies in the hospitality industry. First of all, quarterly data is used instead of annual data unlike the previous studies. By using quarterly data, not only can more data points be obtained, but also time period analysis can be done. Furthermore, casino companies are divided into three segments to see if there are any differences in means of systematic risk among the segments. Then, analysis of variance (ANOVA) and independent samples t-test are used instead of multiple regression analysis. Again, this methodology is a new approach of systematic risk analysis in the hospitality industry and the researcher hopes these new ways of analyses can motivate hospitality researchers who are interested in systematic risk analysis.

5. Definition of Terms

1. Risk: Systematic Risk (Beta) - "It indicates the volatility of a security's returns relative to the returns of a broad-based market portfolio of securities (Moyer, McGuigan, and Rao, 2005)."
2. Liquidity – "The ability of a firm to meet its cash obligations as they come due (Moyer et al, 2003)." According to Jesen (1986), available resources might not be invested if liquidity is high while the high ratio means that a firm can meet short-term cash needs that might reduce risk.

3. Quick Ratio (QR) – “Indicator of a company's financial strength (or weakness). Calculated by taking current assets less inventories, divided by current liabilities. This ratio provides information regarding the firm's liquidity and ability to meet its obligations. Also called the Acid test ratio (Morgenson, 2002).”
4. Leverage – “Use of debt financing. A firm’s use of assets and liabilities having fixed costs. A firm uses leverage in an attempt to earn returns in excess of the fixed costs of these assets and liabilities, thus increasing the return to common stockholders (Morgenson, 2002).”
5. Debt to Equity (DE) – “Indicator of financial leverage. Compares assets provided by creditors to assets provided by shareholders. Determined by dividing long-term debt by common stockholder equity (Morgenson, 2002).”
6. Growth Opportunities– “Opportunity to invest in profitable projects (Morgenson, 2002).”
7. Return on Assets (ROA) – “Indicator of profitability. Determined by dividing net income for the past 12 months by total average assets. Result is shown as a percentage. ROA can be decomposed into return on sales (net income/sales) multiplied by asset utilization (sales/assets) (Morgenson, 2002).”

6. Organization of the Study

This research consists of five chapters. Chapter one, the introduction, includes the background, purpose, significance of the research, and definitions of the terms used. Chapter two is the review of literature. Related studies are reviewed in the literature review section. Chapter three is the methodology explains the way to collect and analyze the samples of the study. Chapter four addresses the results of the study. Chapter five is the conclusion. This chapter includes discussion, limitations, recommendations and suggestions for the future research.

CHAPTER II

REVIEW OF LITERATURE

1. Empirical Studies in the Hospitality Industry

In the hospitality industry, financial ratio analysis has been one of the most popular methods to determine if the industry is risky. Thus, multiple studies of the relationships between risks and a few financial variables have already been conducted.

In the hotel industry, Kim, Gu, and Mattila (2002) specifically examined the systematic risk of hotel real estate investment trust (REIT) companies with seven variables as relevant factors of systematic risk: leverage, growth, firm size, liquidity, efficiency, profitability, and dividend payout ratio. The samples were 19 publicly traded U.S. hotel REIT companies from1993 through 1999, which was a rapid growth period for them. They found that leverage ratio and growth were positively related to systematic risk. Moreover, firm size had a negative relationship with systematic risk in their study. Except for leverage ratio, growth rate, and firm size, Kim et al. (2002) could not find correlations between the other variables and systematic risk. They suggested that the firms needed to decrease external financing while increase internal financing to decrease the firms' systematic risk. Moreover, growth by consolidation, merger, or acquisition was recommended as another technique to reduce companies' high systematic risk.

Lee and Jang (2007) investigated 16 U.S. airline companies from 1997 through 2002 to find out relationships between systematic risk and seven financial variables: liquidity, leverage, efficiency, profitability, firm size, growth, and safety. In the results,

profitability, growth, and safety were negatively related to the systematic risk. However, leverage and firm size were positively related to the systematic risk. The study proposed that airline companies should set up valuable financial strategies and lower operating costs to decrease the systematic risk.

In the restaurant industry, Borde (1998) studied which financial characteristics affect a company's risk. He compared firms' systemic risk (Beta) and total risk with liquidity, dividend payout ratio, leverage, return on assets as a profitability measure, and growth opportunities, using data from 1992 through 1995. According to his results, the level of liquidity and growth opportunity were positively related to systematic and total risk, while dividend payout ratio and return on assets were negatively related to those. In addition, the researcher concluded that leverage ratio was almost irrelevant with risks. This is a very surprising result because leverage is generally believed to be related positively with risk.

Next, there was a follow-up study of Borde's. Gu and Kim (2002) investigated which financial factors affect restaurant firms' systematic risk. The researchers used the same methodology as Borde's study but with a larger sample size and a different period of 1996 through 1999. Moreover, asset turnover and total assets, representing efficiency and firm sizes, were included as addition financial variables. However, the researchers did not include total risk as a dependent variable because they determined that unsystematic risk was not a relevant factor considering CAPM theory. They only found that a firms' systematic risk had a negative relationship with assets turnover, but had a positive relationship with quick ratio. Therefore, Gu and Kim's findings were not

consistent with Borde's findings, requiring further studies in this area to reach a clear conclusion.

Kim, Ryan, and Ceschini (2007) continued to examine how financial ratios are correlated with systematic risk in the restaurant industry. Interestingly, they divided the restaurant industry into 2 sectors, quick-service and full-service. Total sample size was 58, 25 quick-service restaurants and 33 full-service restaurants, and the financial variables were profitability, leverage, efficiency, liquidity, growth, and firm size. For the overall restaurant industry, they found negative relationship between profitability and systematic risk, and leverage and liquidity were positively related to systematic risk. Even though profitability was also negatively related to systematic risk in both quick-service and full-service segments, leverage was not statistically significant in the full-service segment. However, leverage was still positively related to systematic risk in the quick-service segment. Although the results showed some different statistical relationships between two segments, the researchers could not conclude if quick-service and full-service segments were significantly different because of the mixed results. The researchers also found some difficulties in dividing the restaurant industry into 2 segments since some firms in the sample could not be included in either one. The study of Kim et al. (2007) likewise does not show the same results with previous two studies investigating the restaurant industry.

Gu and Kim (1998) examined what affects casino firms' stocks and their systematic risk. Thirty-five U.S. casinos' financial data from 1992 to 1994 was used, and current ratio, leverage ratio, assets turnover ratio, and profit margin ratio were investigated as potential determinants of systematic risk. The ratios stood for liquidity,

leverage, efficiency, and profitability. The results showed that only assets turnover, an efficiency measure, was negatively related to firms' systematic risk and no relationship was found between the other variables and systematic risk. According to the results, efficient use of existing assets would help firms reduce systematic risk rather than new investments. However, the researchers could not find any relationships between systematic risk and the other variables except assets turnover. In other words, it might be hard to conclude that casino firms should concentrate on using existing assets as a risk-reduction technique rather than expansion.

To sum up, previous researchers have studied relationships between risk and financial variables in the hospitality industry (Borde, 1998; Gu and Kim, 1998; Gu and Kim, 2002; Kim, Gu, and Mattila, 2002; Kim, Ryan, and Ceschini, 2007; Lee and Jang, 2007), their findings were mixed.

Table 1 summarizes researches about relationship between financial variables and systematic risk.

		Relationships with systematic risk (beta)							
Studies	**Industry**	**Profit**	**Leverage**	**Liquidity**	**Growth**	**Firm size**	**Efficiency**	**Dividend payout**	**Safety**
Kim, Gu,& Mattila (2002)	Hotel	NR	+	NR	+	-	NR	NR	X
Lee& Jang (2007)	Airline	-	+	NR	-	+	NR	X	-
Borde (1998)	Restaurant	-	NR	+	+	X	X	-	X
Gu& Kim (2002)	Restaurant	NR	+	NR	NR	NR	-	NR	X
Kim, Ryan,& Ceschini (2007)	Restaurant	-	+	+	NR	NR	NR	X	X
Gu& Kim (1998)	Casino	NR	NR	NR	X	X	-	X	X

Table 1. Summary of Empirical Studies in the Hospitality Industry

+: Positive Relationship
- : Negative Relationship
NR: No Relationship
X: Not investigated.

2. Systematic Risk

Capital Asset Pricing Model (CAPM) (Lintner, 1965; Sharpe, 1963& 1964) is generally used to explain relationship between risk of investment and returns (Kim, Gu, and Mattila, 2002). The following formula is the basic equation of the model.

$$k_i = k_{rf} + \beta_i[k_m - k_{rf}] \qquad (1)$$

where,

k_i = the required rate of return

k_{rf} = risk-free rate

β_i = stock i's beta

k_m = market return

$[k_m - k_{rf}]$ = market risk premium

There are two types of risk in accordance with CAPM theory; systematic risk and unsystematic risk. Systematic risk is the volatility of returns in relation to the returns of a broad-based market portfolio of securities and indicated as beta (Moyer, McGuigan, and Rao, 2005). Next, unsystematic risk is volatility of returns caused by specific events by firm (Lintner, 1965; Sharpe, 1963& 1964). Total risk is the sum of the two risks.

According to the CAPM model, risk that is concerned by rational investors is systematic risk since that risk is unable to be eliminated by diversification strategy. In contrast, unsystematic risk can be removed by portfolio diversification (Lintner, 1965; Sharpe, 1963& 1964). Gu and Kim (2003) mentioned that each stock movement in the market counterbalanced each other when firm-specific events, such as lawsuits or strikes occurred. Therefore, investors could reduce unsystematic risk by holding larger portfolios of various different stocks.

Since systematic risk is correlated with the market, portfolio diversification strategy cannot help reduce systematic risk. That is, the volatility affects all stocks in the market at the same time. Economic recession, inflation, war, or elections are some examples of the market events (Gu and Kim, 2003).

As said by CAPM theory, high systematic risk can be compensated by high returns. However, unsystematic risk is not necessarily compensated to investors because investors can reduce it by their strategies.

3. Systematic Risk Determinants and Hypotheses Development

A. Profitability

Various financial ratios have been used to measure profitability. Return on Asset (ROA) is one of the widely used indicators as a profitability measure. Borde (1998) suggested that restaurant companies could be less risky if their returns on assets were high. Lee and Jang (2007) also used ROA as a measure of profitability. Some

researchers (Kim, Ryan, and Ceschini, 2007) used return on investment (ROI). This study uses ROA as a profitability indicator.

It is generally known that profitable firms are less risky. A firm with greater profitability can reduce the possibility of a firm's failure. Therefore, profitability is negatively related to systematic risk. Many researchers have found negative relationships between systematic risk and profitability (Logue and Merville, 1972; Scherrer and Mathison, 1996; Borde ,1998; Kim, Ryan, and Ceschini, 2007; Lee and Jang, 2007). However, Melicher (1974) concluded that return on equity, a profitability measure, was positively related to systematic risk. Borde (1998) also mentioned that firms with high operating profits might use aggressive business strategies and end up with high risk. In conclusion, hypothesis 1 is set based on the traditional view of a negative relationship between profitability and systematic risk.

> Hypothesis 1: Return on assets (Profitability) is negatively related to systematic risk.

B. Liquidity

There are several financial ratios that measure liquidity. Gu and Kim (1998) used current ratio (CL) as a liquidity determinant. Current Ratio is an indication of a company's ability to meet its short-term debt obligations. Therefore, a company is more liquid if the ratio is high. Current ratio is equal to current assets divided by current liabilities.

Furthermore, quick ratio (QR) is another measure of liquidity. Quick ratio is equal to cash, marketable securities, and accounts receivable divided by current liabilities. Firms with higher quick ratio are generally considered to have stronger financial capacity.

Several hospitality researchers also used this measure (Gu and Kim, 1998; Gu and Kim, 2002; Kim, Gu, and Mattila, 2002; Kim, Ryan, and Ceschini, 2007). Quick ratio is used as a financial determinant of liquidity in this research.

Borde (1998) found a positive relationship between high liquidity and higher systematic risk. The researcher suggested that high liquidity might be associated with unwise use of available cash and short-term securities. The studies of Jensen (1984) and Kim, Ryan, and Ceschini (2007) also support the result of Borde's study (1988).

However, there are still arguments about this finding. Since liquidity is the ability of a firm to meet its cash obligations as they come due, Borde (1998) also mentioned that the firm's ability to collect necessary cash might lower the risk. Furthermore, Logue and Merville (1972), and Moyer and Chatfield (1983) found that liquidity was negatively related to Beta in their empirical studies. In this study, hypothesis was set based on the theory of positive relationship between them. Thus, hypothesis 2 is proposed as below;

Hypothesis 2: Quick ratio (Liquidity) is positively related to systematic risk.

C. Leverage

Among many financial ratios for measuring leverage, some researchers (Moyer and Chatfield, 1983; Kim, Ryan, and Ceschini, 2007) selected debt to equity ratio (DE). This ratio is calculated by dividing debt by common stockholder equity. Investing in a company with a higher debt to equity ratio could be risky particularly when interest rates are going up, because the additional interest that has to be paid out for the liability. Debt to asset ratio (DA) which is equal to firm's total debt divided by total assets is also commonly used. Gu and Kim (1998), Kim, Gu, and Mattila (2002), and Lee and Jang

(2007) used debt to assets ratio for a leverage measure. Equity ratio, total equity to total assets, has also been used by some researchers (Borde, 1998; Gu and Kim, 2002). As seen above, there are many financial ratios that represent a firm's leverage. Among them, the researcher selected debt to equity (DE) as a variable.

Delcoure and Dickens (2004), and Mandelker and Rhee (1984) addressed that financial leverage has a significant relationship with a firm's systematic risk. Regarding the direction of the relationship between them, Borde (1998) mentioned that leverage and systematic risk were generally believed to be related positively to risk. In empirical studies, Mandelker and Rhee (1984) found a positive relationship between financial leverage and systematic risk, and Huffman's (1984) research, a follow-up study of Mandelker and Rhee (1984) supported the positive relationship between them. Moreover, Ang, Peterson, and Peterson (1985), Gu and Kim (2002), Kim, Gu and Matilla. (2002), Kim, Ryan, Ceschini (2007), Lee and Jang (2007), and Melicher (1974) also found that financial leverage was positively related with systematic risk. Consequently, hypothesis 3 is as below;

> Hypothesis 3: Debt to equity ratio (Leverage) is positively related to systematic risk.

D. Efficiency

The studies of Gu and Kim (1998) and Gu and Kim (2002) used asset turnover ratio as a measure of efficiency. Net sales divided by the average of the current year's total assets and prior year's total assets is the calculation of asset turnover ratio. Receivable turnover ratio is also widely used as an efficiency measure in some studies.

Gallinger and Healey (1987) mentioned that receivable turnover was a very important measure of a funds flow. In this study, total asset turnover ratio was used as several previous studies in the hospitality industry.

Logue and Merville (1972) discovered that systematic risk was negatively related to assets efficiency. Asset turnover ratio was used as an efficiency measure in the study. Asset turnover is calculated diving total revenue by total assets for the period. This ratio is helpful to know the amount of sales that are made from each dollar of assets. Therefore, firms with low profit margins are likely to have high asset turnover and vice versa. Gu and Kim (1998) and Gu and Kim (2002) also found negative relationship between efficiency and systematic risk. In short, Hypothesis 4 is proposed as following.

Hypothesis 4: Total assets turnover (Efficiency) is negatively related to systematic risk.

E. Growth

Basically, growth rate means that the amount of increase that a specific variable has grown within a specific time and situation. Growth rate in this study is the changes in total assets in the given period. First of all, total assets of the current year is subtracted by those of previous year, and then divided by previous year. Annual percentage changes in total assets were also used in Kim, Gu, and Matilla's study (2002) as a growth measure. Some hospitality researchers (Borde, 1998; Gu and Kim, 2002; Kim, Ryan, and Ceschini, 2007; Lee and Jang; 2007) utilized annual percentage changes of earning before interest and income taxes (EBIT) instead of those of assets. This study employed annual percentage changes in total assets as a growth indicator.

Fast growing firms might see more competition in the future and be more susceptible to economic fluctuations (Logue and Merville, 1972). Borde (1998) pointed out that rapid growing restaurants could be at risk because they might not have enough resources to deal with internal stress caused by rapid growth. Furthermore, Borde (1998) found that growth rate was positively related to systematic risk. The positive relationship is also supported by the research of Kim, Gu, and Mattila (2002).

However, Alnajjar and Riahi-Belkaoui (2001) investigated manufacturing and service firms, and found a negative relationship between growth opportunities and systematic risk. Borde (1998) also pointed out that firms with high growth rate would keep getting bids from investors with the expectation of higher future earnings. In that way, the firms should be able to keep the prices of their stocks higher.

In spite of mixed findings on growth rate, the hypothesis of this study will be based on the negative relationship between systematic risk and growth rate. Therefore, hypothesis 5 is as below.

Hypothesis 5: Growth rate is negatively related to systematic risk.

4. Summary of Hypotheses

Table 2. Summary of Hypothesis

Hypothesis 1	Return on assets (Profitability) is negatively related to systematic risk.
Hypothesis 2	Quick ratio (Liquidity) is positively related to systematic risk.
Hypothesis 3	Debt to equity ratio (Leverage) is positively related to systematic risk.
Hypothesis 4	Total assets turnover (Efficiency) is negatively related to systematic risk.
Hypothesis 5	Growth rate is negatively related to systematic risk.

5. One-way ANOVA and Independent Samples T-tests

Multiple hospitality researchers (Borde, 1998; Gu and Kim, 1998; Gu and Kim, 2002; Kim, Gu, and Mattila, 2002; Kim, Ryan, and Ceschini, 2007; Lee and Jang, 2007) have studied determinants of systematic risk using multiple regression analysis. However, other statistical methods have not been used for analyzing the determinants of systematic risk in the hospitality industry relatively.

In addition to the traditional way (multiple regression analysis), the researcher tried to find different approaches for systematic risk analysis and found ways to utilize one-way analysis of variance (ANOVA) and independent samples t-test in the study. The one-way ANOVA can be used to compare the means of two or more groups. Therefore, it is useful to determine if there are mean differences in systematic risk seasonally or/ and within each sector. Moreover, the independent samples t-test is used to compare the means of two independent samples. Coding data in the dummy variables can provide more flexibility in selecting a methodology and the independent samples t-test can be conducted by dummy coding.

CHAPTER III

METHODOLOGY

The methodology is divided into two sections. The first section is multiple regression analysis using annual data set as similar to the previous studies. The second section is analysis of variance and t-tests using quarterly data.

Part I. Multiple Regression Analysis of Annual Data

1. Data Collection

A. Industry Classification

During the period of 2002 through 2006, all U.S. casino firms listed in the Standard& Poor's Compustat were retrieved based on the Global Industry Classification Standard (GICS). According to the Standard& Poor's (2006), GICS was developed by Standard& Poor's and MSCI/Barra in 1999 to establish a global standard for classifying firms into sectors and industries. Revenues, earnings, and market perceptions were in consideration when this classification standard was developed. The GIC consists of 10 sectors, 24 industry groups, 67 industries, and 147 sub-industries. The following classification was used to get information about the casino industry;

a. Sector: Consumer Discretionary -GICS code: 25
b. Industry Group: Consumer Services -GICS code: 2530
c. Industry: Hotel, Restaurants & Leisure -GICS code: 253010

d. Sub-industry: Casinos& Gaming- GICS code: 25301010

Total population was 70 in the given period.

B. Financial Variables

Required financial data of the casinos for the given period (2002 to 2006) was retrieved, which were systematic risk (beta), return on assets (ROA), quick ratio (QR), debt to equity ratio (DE), total asset turnover, and total assets to calculate growth rate from 2001 to 2006. The companies without fully available financial information were thrown out. Considering those conditions, 29 casinos were eventually retained in the sample of the study. The systematic risk is indicated as beta in the Standard and Poor's Compustat database. Systematic risk (beta) is calculated from a 5-year regression between the relationship of the monthly percentage changes in the Standard and Poor's 500 Index and the monthly percentage changes in the price of the stock. The calculation method of each financial variable according to the Standard and Poor's database is listed below.

a. Return on assets (ROA): Total net income/ Total assets.
b. Liquidity (Quick Ratio): Cash and equivalents, which are readily transferable to cash, and plus total receivables, which are claims against other collectible in money within one year / Current liabilities.
c. Leverage (Debt to Equity Ratio): Total Debt / Total Stockholders' Equity.
d. Total Assets Turnover: Net sales / Average of the current year's total assets and prior year's total assets.

e. Growth rate: (Current year's total assets – Previous year's total assets) / Previous year's total assets.

2. Statistical Analysis

Statistical Package for Social Science (SPSS) was used as the statistical tool. In this study, multiple regression analysis was used as similar previous studies in the hospitality industry (Borde, 1998; Gu and Kim, 1998; Gu and Kim, 2002; Kim, Gu, and Mattila, 2002; Kim, Ryan, and Ceschini, 2007; Lee and Jang, 2007). Beta (systematic risk) was a dependent variable in the analysis, while five-year average values of return on assets (ROA), quick ratio (QR), debt to equity ratio (DE), total asset turnover, and growth rate were independent variables. Following is the equation for the regression analysis.

$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_{5,}$

where,

Y= Estimated yearly beta (systematic risk)

A= Intercept

X_1= Profitability

X_2= Liquidity

X_3= Leverage

X_4= Efficiency

X_5= Growth

Part II. Analysis of Quarterly Data

The second part of methodology is a different approach to a systematic risk analysis considering traditional risk analysis studies in the hospitality industry. For the second part of methodology, quarterly data was used instead of annual data unlike the previous studies. By using quarterly data, not only more data points could be obtained but also time period analysis could be done. Additionally, casino companies were divided into three groups at this time. Lastly, analysis of variance (ANOVA) and t-test were used instead of multiple regression analysis. Again, this methodology is a new way of systematic risk analysis in the hospitality industry. Since data points have increased from 145 (29 companies x 5 years) to 512 (32 companies x 16 quarters), quarterly data is expected to bring more reliable results on ANOVA and t-tests.

1. Data Collection

The Standard& Poor's Compustat database was also used for retrieving quarterly data of the same industry group. However, the quarterly data could be collected only for 4 year range from quarter 1, 2003 to quarter 4, 2006 instead of 5 year range as the annual data of 2002 through 2006, due to availability. The same financial variables were included in the data set, which were systematic risk (beta), return on assets (ROA), quick ratio (QR), debt to equity ratio (DE), total asset turnover, and total assets for calculation on growth rate from quarter 4 of 2002. In addition, time period (quarter) and company type were newly added as independent variables. Casino firms could be divided into three

groups, which were pure casinos, manufactures, and other gaming activities such as online games, horserace tracks or off-site betting. Both company's websites and www.finance.yahoo.com were investigated to determine types of the casino firms (APPENDIX D). After companies without complete financial information were excluded, 32 casino firms out of 70 were finally included as the sample. To be exact, 3 more firms could be retained in the quarterly data set compared to the annual data set.

2. Statistical Analysis

A. Analysis of Variance (ANOVA)

Statistical Package for Social Science (SPSS) was also used for the second methodology part. One-way analysis of variance (ANOVA) was conducted three times. The first one-way ANOVA was used to compare means of systematic risk (beta) among 3 types of casino firms. The second one-way ANOVA was conducted to see if there were any significant differences in mean values of beta among quarters. If there are any differences in means of beta value by quarters within the same company types, the third one-way ANOVA was conducted.

Along with each ANOVA analysis, post-hoc test had to be conducted, because there was lack of evidence where the differences occurred. Therefore, Tukey's post-hoc test was used along with all analyses to verify that.

B. T-test

Independent samples t-test was performed to find out if there were any mean differences in systematic risk (beta) among companies which had relatively higher or

lower value in some specific financial variables. For instance, companies with relatively higher ROA and those with relatively lower ROA might have some differences in means of systematic risk (beta). First of all, all the numbers in five financial variables were recoded into either 0 or 1 with dividing point of each median. That is, values higher than median were recoded to 1 and those lower than medians were recoded to 0. Therefore, all data values were transformed into either 0 or 1.

Initially, 5 t-tests were conducted for each financial variable regardless of company types. Then, companies were divided in 3 categories as above and another 5 t-tests were performed to see the results within the same company types.

CHAPTER IV

FINDINGS

Part I. Multiple Regression Analysis of Annual Data

Table 3 is the descriptive statistics of the variables of the 29 samples. First of all, the mean of systematic risk (Beta) is 0.8862 with a range of -0.9970 to 2.9980. During this period, Trump casino had the highest beta value of 2.9980 while Trans world Corporation had the lowest of -0.9970. Trump casino also had highest debt to equity ratio, which was approximately 7174.57.

Table 3. Descriptive Statistics of Variables in Regression Analysis (N = 29)

	N	Minimum	Maximum	Mean	Std. Deviation
Beta	29	-0.9970	2.9980	0.8862	0.7304
ROA	29	-15.8608	16.2318	2.5481	7.2710
QR	29	0.5134	3.5592	1.1391	0.6567
DE	29	-964.9728	7174.5706	320.1310	1355.2108
TAT	29	0.1060	2.0760	0.8068	0.4468
Growth	29	-0.0721	0.8315	0.1983	0.2124
Valid N	29				

Table 4 shows correlations among variables regression-analysis. As shown in Table 4, return on assets has the highest negative relationship with beta (-0.1780), while debt to equity is highly related to beta positively (0.5432). In short, quick ratio and debt

to equity ratio showed positive directions related to beta, while return on assets, total asset turnover, and growth rate had negative relationships with beta.

Table 4. Correlations of Variables in Regression Analysis (N = 29)

	Beta	ROA	QR	DE	TAT	Growth
Beta	1.0000					
ROA	-0.1780	1.0000				
QR	0.2460	0.2286	1.0000			
DE	0.5432*	-0.1483	-0.0001	1.0000		
TAT	-0.0403	0.4652*	-0.1482	-0.1534	1.0000	
Growth	-0.1365	0.4156*	0.6327*	-0.0879	-0.0113	1.0000

*Significant at $p<0.05$

Table 5 is the result of a multiple regression analysis of the casino industry in order to examine relationships between financial measures and systematic risk. The adjusted R^2 value was approximately 0.37, thus this model explains 37% of the variation in Beta ($F=4.327$, $df=28$, $p= 0.05$). Variance inflation factors (VIF) is presented in Table 5 to check the presence of multicollinearity. In general, VIF below 10 indicates that multicollinearity is not a major concern (Neter, Wasserman, and Kutner, 1989). Since VIF values were much lower than 10, as observed in Table 5, multicollinearity is not likely to be a problem (Neter et al., 1989).

Return on asset (ROA) was not significant at any level. Therefore, this measure is not likely to be related to Beta. Consequently, ROA hypothesis (H1) is not accepted.

As proposed in QR (liquidity) hypothesis 2, liquidity was significant at $p< 0.05$ and it was positively related to systematic risk (Beta). Even though previous empirical studies showed mixed results regarding the relationship between liquidity and Beta, positive relationship was found in the results of this study. Therefore, liquidity hypothesis 2 (H2) is accepted.

Debt to equity ratio was hypothesized as a positive factor of systematic risk in the study. As a result, debt to equity was found to be positively related to Beta and most statistically significant. This relationship is also similar to the results of many previous studies. Therefore, debt to equity (leverage) hypothesis (H3) is accepted.

Again, total asset turnover was not significant at any level. Consequently, total asset turnover hypothesis (H4) cannot be accepted.

Even though growth opportunity was not significant at 0.05 level, it could be accepted at 0.10 level ($p=0.094$). Growth opportunities measure was negatively related to a firm's systematic risk. Thus, hypothesis 5 (H5) is also accepted at 0.10 level.

Table 5. Multiple Regression Model

	Coefficient	T-Stat	Sig. (p)	VIF
ROA	-0.163	-0.843	0.408	1.659
QR	0.542	2.75	0.011**	1.734
DE	0.516	3.386	0.003**	1.038
TAT	0.191	1.067	0.297	1.425
Growth	-0.364	-1.746	0.094*	1.944

Dependent Variable: Beta

R Square = 0.485, Adjusted R Square= 0.373, F= 4.327, df= 28, Sample size= 29
**Significant at p<0.05
*Significant at p<0.10

Part II. Analysis of Quarterly Data

A. ANOVA

First one-way ANOVA was conducted to determine whether there were any significant mean differences in systematic risk (beta) among different types of casino firms and the result is shown in Table 6. Type 2 companies had the highest mean of systematic risk (1.1638), followed by type 1 (0.9534) and type 3 (0.7362). The one-way ANOVA test showed that there were significant differences in systematic risk among company types. Tukey's post hoc test found differences among all 3 company types. This result shows that casino machine manufactures are most risky, while pure casino operations are least risky among all types of casino firms.

Table 6. ANOVA: Differences in Systematic Risk among Different Types of Casino Firms

Company type	N	Mean	Std. Deviation	F value	P value
1 (Other gaming)	224	0.9534	0.5610	20.126	0.0001*
2 (Machine manufacture)	96	1.1638	0.4937		
3 (Pure casino)	192	0.7362	0.5769		
Total	512	0.9114	0.5756		

*p<0.05

Table 7 shows the result of the second ANOVA to find out if any significant differences in means of beta exist among quarters. The result indicates that the differences in means of systematic risk are not significant among quarters.

Table 7. ANOVA: Differences in Systematic Risk among Quarters

Quarter	N	Mean	Std. Deviation	F value	P value
1	128	0.8739	0.5411	0.311	0.817
2	128	0.9405	0.5841		
3	128	0.9073	0.5868		
4	128	0.9239	0.5936		
Total	512	0.9114	0.5756		

*p<0.05

Third ANOVA was conducted to see if there were any differences in means of systematic risk by quarters within the same company types. However, no significant differences were found within the same company types, either (Table. 8). That is, differences in means of systematic risk by quarters are not significant within either overall casino firms or any specific type of firms.

Table 8. ANOVA: Differences in Systematic Risk among Quarters within Specific Company Types

Company type	Quarter	N	Mean	Std. Deviation	F value	P value
1. Other gaming	1	56	0.9127	0.5693	0.1399	0.936
	2	56	0.9770	0.5807		
	3	56	0.9585	0.5466		
	4	56	0.9655	0.5599		
	Total	224	0.9534	0.5610		
2. Casino machine manufacture	1	24	1.1159	0.5099	0.104	0.9575
	2	24	1.1905	0.4914		
	3	24	1.1780	0.5016		
	4	24	1.1710	0.5002		
	Total	96	1.1638	0.4937		
3. Pure casino operation	1	48	0.7077	0.4743	0.1416	0.9349
	2	48	0.7731	0.5891		
	3	48	0.7122	0.6152		
	4	48	0.7517	0.6318		
	Total	192	0.7362	0.5769		

*p<0.05

B. T-test

Independent sample t-test was used to see if there were any mean differences in systematic risk (beta) between Group C_L (companies that had lower numbers than medians in specific financial variables) and Group C_H (companies that had higher values than medians in specific financial variables). Table 9 shows that there is significant difference in means of systematic risk between companies with lower ROA and those with higher ROA. In other words, companies with higher ROA have relatively lower systematic risk with mean difference of 0.1645. Next, significant difference was found in quick ratio, too. Companies with higher quick ratio were found out to be more risky according to the result (mean difference: -0.2126). However, t-tests for debt/equity ratio, asset turnover ratio, and growth opportunity ratio were not statistically significant.

Table 9. Independent Samples T-test: Differences in Systematic Risk between Group C_L and Group C_H (Overall)

Variables	**Group C_L/ C_H**	**Mean (beta)**	**Std. Deviation**	**t (2-tail)**	**P**
Return on Assets	C_L	0.9937	0.5897	3.2644	0.001*
	C_H	0.8291	0.5501		
Quick Ratio	C_L	0.8055	0.5451	-4.248	0.0001*
	C_H	1.0181	0.5868		
Debt/Equity	C_L	0.8901	0.5181	-0.836	0.404
	C_H	0.9327	0.6282		
Asset Turnover	C_L	0.9334	0.6046	0.868	0.386
	C_H	0.8892	0.5452		
Growth Opportunity	C_L	0.9242	0.5973	0.501	0.616
	C_H	0.8986	0.5539		

*$p<0.05$

Another 5 t-tests were performed to see the results within the same company types after companies were divided into 3 categories again. The results are shown in Table 10, Table 11, and Table 12 and the findings were mixed. As shown in Table 10, type 1 companies with high in quick ratio and asset turnover ratio were found out to have lower systematic risk within the same group.

Table 10. Independent Samples T-test: Differences in Systematic Risk between Group C_L and Group C_H (Company Type 1; Other Gaming; Horserace Tracks, Off-site Betting, Online Casinos, and etc.)

Variables	**Group C_L/ C_H**	**Mean (Beta)**	**Std. Deviation**	**t (2-tail)**	**P**
Return on Assets	C_L	0.9914	0.4853	1.238	0.244
	C_H	0.8969	0.6567		
Quick Ratio	C_L	1.0386	0.5555	2.379	0.018*
	C_H	0.8620	0.5550		
Debt/Equity	C_L	0.9411	0.5260	-0.360	0.720
	C_H	0.9682	0.6025		
Asset Turnover	C_L	1.0357	0.5170	1.949	0.049*
	C_H	0.8894	0.5870		
Growth Opportunity	C_L	1.0081	0.5533	1.437	0.152
	C_H	0.9006	0.5657		

*$p<0.05$

Type 2 companies with higher return on assets had lower systematic risk within the group, while those with higher debt to equity ratio or asset turnover ratio had higher risk.

Table 11. Independent Samples T-test: Differences in Systematic Risk between Group C_L and Group $C_{H.}$ (Company Type 2; Casino Machine Manufacture)

Variables	**Group C_L/ C_H**	**Mean (Beta)**	**Std. Deviation**	**t (2-tail)**	**p**
Return on Assets	C_L	1.3308	0.4469	2.97733	0.004*
	C_H	1.0394	0.4938		
Quick Ratio	C_L	1.1506	0.2818	-0.06124	0.951
	C_H	1.1646	0.5037		
Debt/Equity	C_L	1.0752	0.4906	-2.27067	0.025*
	C_H	1.3052	0.4710		
Asset Turnover	C_L	1.0189	0.4934	-3.13432	0.002*
	C_H	1.3213	0.4480		
Growth Opportunity	C_L	1.1115	0.3765	-1.02697	0.307
	C_H	1.2141	0.5841		

*$p<0.05$

Type 3 companies with higher quick ratio had higher systematic risk. Moreover, the companies with lower asset turnover ratio had higher risk within the group.

Table 12. Independent Samples T-test: Differences in Systematic Risk between Group C_L and Group C_H (Company Type 3; Pure Casino Operation)

Variables	**Group C_L/ C_H**	**Mean (Beta)**	**Std. Deviation**	**t (2-tail)**	**p**
Return on Assets	C_L	.8268	.72841	1.87076	0.063
	C_H	.6701	.42619		
Quick Ratio	C_L	.5941	.44954	-4.82176	0.0001*
	C_H	1.0813	.69906		
Debt/Equity	C_L	.6617	.44664	-1.435	0.153
	C_H	.7839	.64416		
Asset Turnover	C_L	.8022	.69690	1.98317	0.049*
	C_H	.6495	.34967		
Growth Opportunity	C_L	.7420	.68056	0.14305	0.886
	C_H	.7300	.44454		

*$p<0.05$

CHAPTER V

CONCLUSION

This study examined financial measures which are the determinants of systematic risk in the casino industry. Financial data was collected from 29 casinos in the U.S. in the period of 2002 through 2006 for the multiple regression analysis using annual data set as previous empirical studies. In addition, ANOVA and t-tests were conducted with quarterly data for additional analyses unlike the traditional ways, regression with annual data, to investigate the determinants of systematic risk in the hospitality industry. The total numbers of casino firms included in quarterly data was 32. From Table 13 through Table 15 shows the summarized results of this study.

Table 13. Summary of Multiple Regression Analysis

Hypothesis 1	Return on assets (Profitability) is negatively related to systematic risk.	Not significant
Hypothesis 2	Quick ratio (Liquidity) is positively related to systematic risk.	Accepted
Hypothesis 3	Debt to equity ratio (Leverage) is positively related to systematic risk.	Accepted
Hypothesis 4	Total assets turnover (Efficiency) is negatively related to systematic risk.	Not significant
Hypothesis 5	Growth rate is negatively related to systematic risk.	Accepted

Table 14. Summary of ANOVA with Quarterly Data

Factor	Differences in mean systematic risk (beta)	Descriptions
Company type	Significantly different	Type 2 companies were most risky, followed by type 1, and type 3.
Quarters	Not significant	
Quarters (Type 1 companies)	Not significant	
Quarters (Type 2 companies)	Not significant	
Quarters (Type 3 companies)	Not significant	

Type 1 companies: Other gaming (Horserace tracks, off-site betting, online casinos, and etc.)
Type 2 companies: Casino machine manufacture
Type 3 companies: Pure casino operation

Table 15. Summary of Independent Samples T-Test with Quarterly Data

Financial Variables	Overall	Type 1 companies (Other gaming)	Type 2 companies (Machine manufacture)	Type 3 companies (Pure casino)
ROA	$C_L > C_H$	-	$C_L > C_H$	-
QR	$C_L < C_H$	$C_L > C_H$	-	$C_L < C_H$
DE	-	-	$C_L < C_H$	-
ATO	-	$C_L > C_H$	$C_L < C_H$	$C_L > C_H$
Growth	-	-	-	-

* C_L: companies that have lower numbers than medians in specific financial variables.
* C_H: companies that have higher numbers than medians in specific financial variables.
*If $C_L > C_H$, C_L is more risky. If $C_L < C_H$, C_H is more risky.

1. Comparison of Empirical Studies in the Hospitality Industry and the Results of the Study

Liquidity, leverage, and growth rate were found to have relationships with a firm's systematic risk according to the multiple regression analysis of annual data. Appendix C shows the comparison of empirical studies in the hospitality industry and the results of this study.

First of all, leverage (debt-to-equity ratio (DE)) was found to be the most significant variable affecting systematic risk. The strong positive relationship is supported by some previous studies in the hospitality industry. Even though Borde (1998) and Gu and Kim (1998) didn't find any relationship, the rest of the studies in Appendix C found the same positive relationship between leverage and systematic risk (Gu and Kim, 2002; Kim, Gu, and Mattila, 2002; Kim, Ryan, and Ceschini, 2007; Lee and Jang, 2007). Therefore, it would be helpful for casino firms to reduce their risk if they use less debt.

Moreover, casino investors may need to be careful when they invest in casinos with higher debt.

The second most significant variable was liquidity (quick ratio (QR)) and was found to be positively related to systematic risk. Studies of Borde (1998) and Kim, Ryan, and Ceschini (2007) support this result. As Borde (1998) mentioned, high liquidity could be related to unwise use of available cash and short-term securities. Thus, casino managers should know that excessive liquidity could waste financial resources, and should spend liquidity for profitable projects.

Lastly, there was a negative relationship between growth opportunity and systematic risk. This result is supported by Lee and Jang's finding (2007). As Borde (1998) pointed out, firms with high growth rate could keep getting bids from investors with the expectation of higher future earnings. Hence, casino managers may need to use strategies to focus on more rapid growth by increasing their total assets to get more investors' attention and reduce risk at the same time. To achieve rapid growth rate, global investment could also be a good option.

In conclusion, casino managers need to increase casino firm's growth rate but decrease leverage and liquidity at the same time to reduce firm's risk. For example, managers could increase firms' growth rate by the use of excessive liquidity to invest in operating assets that produce higher returns, rather than using a debt strategy.

2. Conclusions from ANOVA and Independent Samples T-tests

The regression analysis conducted above was about the whole casino industry. However, it is not a very good idea to see the casino industry as one industry when managers and investors want to inspect them accurately. The casino industry can be divided into several segments, and the segments will have different characteristics.

By conducting ANOVA in this study, different segments in the casino industry were proved to have different levels of risk. Specifically, casino machine manufactures were most risky, followed by other gaming operations (horserace tracks, off-site betting, online casinos, and etc.) and pure casino operations. In addition, the results of t-tests proved that different types of companies had different financial characteristics. For example, casino machine manufactures that had relatively lower liquidity or lower growth rate were more risky, while pure casino operations that had relatively higher liquidity or lower growth rate were more risky. Moreover, companies which have higher in debt, higher in growth rate, or lower in profitability were more risky in other gaming operations (horserace tracks, off-site betting, online casinos, and etc.).

In short, different casino managers in the different casino segments should use different financial strategies to reduce risk. Moreover, casino investors should understand these different segments of the casino industry and their unique financial characteristics before they invest in any casino firms.

Regardless of company types, seasonal change was not a significant factor on risk according to another ANOVA conducted in this study. First of all, casinos have added a lot of attractions and things to do in their facilities other than just gaming attractions. As a

result, people can visit casino all year around for many reasons, for example, weddings, conventions, special parties, spas, shows, concerts and etc. Furthermore, casinos hold seasonal events or gaming tournaments regularly. Furthermore, casinos give a bigger discount on hotel rooms or meals to attract more customers in low seasons. Online casino companies might also be less sensitive to seasonal changes.

Briefly, casino managers should keep trying to attract customers with well-established plans and a wide range of activities to keep casinos from having a high-risk season.

Table 16. Summary of Implications

1	Different casino managers in the different casino segments should use different financial strategies to reduce risk.
2	Casino investors should understand unique financial characteristics of different segments in the casino industry.
3	Casino managers should keep trying to attract customers with well-established plans and a wide range of activities to keep casinos from having a high-risk season.

3. Limitations and Future Research

This study could not be free of limitations. First of all, lack of complete data reduced the sample size of this study. Accordingly, the same study periods could not be investigated between annual and quarterly data analyses. Consequently, the same companies could not be included in the samples of annual and quarterly data. Finally, lack of supportive researches for the new methodologies (one-way ANOVA and independent samples t-tests) might also be a limitation.

Clear final answers on systematic risk analyses in the hospitality industry might not be provided from this study's results. However, the goal of this study was aimed to stimulate further researches in the hospitality industry regarding this topic rather than making a final decision.

Future researchers might be able to increase reliability by increasing sample sizes or by obtaining fully available financial data. Moreover, additional independent variables or appropriate ratios to measure each variable can be used to increase significance of the model. For example, firm size could be included as an independent variable. In addition, return on equity could be used instead of return on assets as a profitability measure. Comparing methodologies to analyze the relationship between systematic risk and financial variables in order to find out what the best methodology for the risk analysis could be another possible research. Lastly, researches about global market for the casino industry could also be conducted. Even though the U.S. casino industry is successful and expanding American Gaming Association, 2008), competition will get stiffer at the same

time, and eventually the market will become saturated in the future. That is, managers should plan ahead and make some strategy for the future.

The global casino market is booming now. Recently, Macao in Hong Kong has already overtaken Las Vegas as the world biggest casino market. U.S casino firms like Wynn Resorts, Las Vegas Sands, or MGM Mirage have already penetrated into the global market. Furthermore, the biggest casino in the world, Venetian Macao, owned by Las Vegas Sands is not in the United States. In other words, casino managers should pay more attention to the global market.

Smaller casinos should find a niche in the global market. In other words, they cannot compete directly against larger casino firms. They can invest in smaller projects or find smaller markets which bigger companies are not likely interested in. They can also form joint-ventures to get into the international market.

Casino machine manufactures might be able to export their machines not only to global U.S casinos but also to international local markets.

Online gaming companies should also start to think about global strategies as soon as possible since the internet is already world-wide.

Despite the above reasons, there are still high barriers for casino firms to go global, specifically legal issues or agreements among countries. However, casino managers should understand the concepts of the global village and also have global minds. Companies operated by managers with global minds will be the first ones going into the brand new market over other competitors when all legal issues are taken care of.

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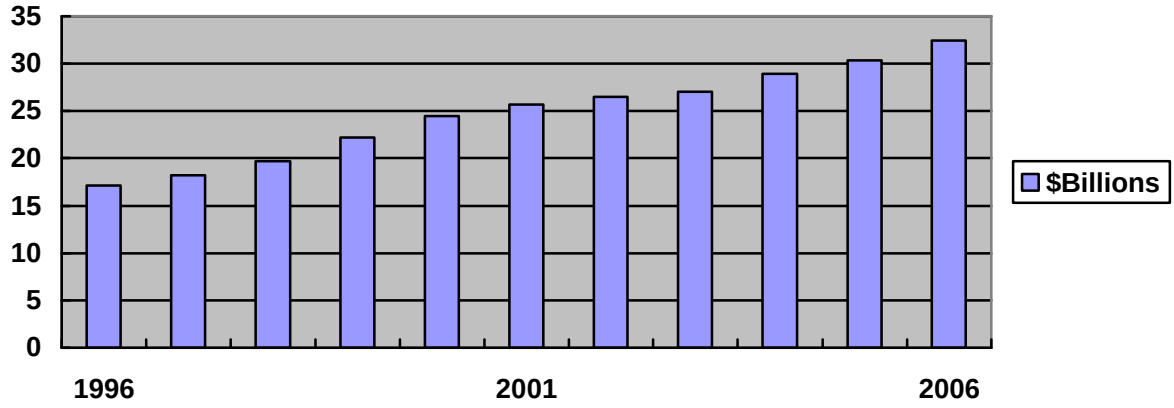
APPENDIX

APPENDIX A

U.S. Consumer Spending on Commercial Casino Gaming, 1996-2006

U.S. Consumer Spending on Commercial Casino Gaming, 1996-2006



(Source: American Gaming Association, 2007)

APPENDIX B

State-by-State Consumer Spending on Commercial Casino Gaming, 2005 vs. 2006

State-by-State Consumer Spending on Commercial Casino Gaming, 2005 vs. 2006

State	2005	2006	Change
Colorado	$755.50 million	$782.10 million	3.50%
Illinois	$1.80 billion	$1.92 billion	6.90%
Indiana	$2.41 billion	$2.58 billion	6.80%
Iowa	$1.11 billion	$1.17 billion	6.10%
Louisiana	$2.23 billion	$2.57 billion	15.10%
Michigan	$1.23 billion	$1.30 billion	6.10%
Mississippi	$2.47 billion	$2.57 billion	4.20%
Missouri	$1.53 billion	$1.59 billion	3.90%
Nevada	$11.65 billion	$12.62 billion	8.40%
New Jersey	$5.02 billion	$5.22 billion	4.00%
South Dakota	$83.56 million	$89.83 million	7.50%

(Source: American Gaming Association, 2007)

APPENDIX C

Comparison of Empirical Studies in the Hospitality Industry and the Results of the Study

Comparison of Empirical Studies in the Hospitality Industry and the Results of the Study

		Relationships with systematic risk (beta)							
Studies	**Industry**	**Profit**	**Leverage**	**Liquidity**	**Growth**	**Firm size**	**Efficiency**	**Dividend payout**	**Safety**
Kim, Gu,& Mattila (2002)	Hotel	NR	+	NR	+	-	NR	NR	X
Lee& Jang (2007)	Airline	-	+	NR	-	+	NR	X	-
Borde (1998)	Restaurant	-	NR	+	+	X	X	-	X
Gu& Kim (2002)	Restaurant	NR	+	NR	NR	NR	-	NR	X
Kim, Ryan,& Ceschini (2007)	Restaurant	-	+	+	NR	NR	NR	X	X
Gu& Kim (1998)	Casino	NR	NR	NR	X	X	-	X	X
This study	Casino	NR	+	+	-	X	NR	X	X

+: Positive Relationship
- : Negative Relationship
NR: No Relationship
X: Not investigated**.**

APPENDIX D

List of Casino Firms– Annual Data

List of Casino Firms – Annual Data

Company name
AMERICAN WAGERING INC
AMERISTAR CASINOS INC
ARCHON CORP
BALLY TECHNOLOGIES INC
BOYD GAMING CORP
CANTERBURY PARK HOLDING CORP
CENTURY CASINOS INC
CHURCHILL DOWNS INC
DOVER DOWNS GAMING & ENTMT
FLORIDA GAMING CORP
GAMING PARTNERS INTL CORP
GLOBAL CASINOS INC
HARRAHS ENTERTAINMENT INC
INTL GAME TECHNOLOGY
LITTLEFIELD CORP
MAGNA ENTERTAINMENT CORP
MGM MIRAGE
MTR GAMING GROUP INC
MULTIMEDIA GAMES INC
PENN NATIONAL GAMING INC
PINNACLE ENTERTAINMENT INC
PROGRESSIVE GAMING INTL CORP
RIVIERA HOLDINGS CORP
SCIENTIFIC GAMES CORP
SHUFFLE MASTER INC
STATION CASINOS INC
TRANS WORLD CORP/NV
TRUMP ENTERTAINMENT RESORTS
WYNN RESORTS LTD

APPENDIX E

Casino Firms by Business Type – Quarterly Data

Casino Firms by Business Type – Quarterly data

Company type 1	Company type 2	Company type 3
AMERICAN WAGERING INC	INTERACTIVE_SYSTEMS WORLDWDE	AMERISTAR CASINOS INC
ARCHON CORP	INTL GAME TECHNOLOGY	BOYD GAMING CORP
BALLY TECHNOLOGIES INC	PROGRESSIVE GAMING INTL CORP	CENTURY CASINOS INC
CALL NOW INC	SCIENTIFIC GAMES CORP	FULL HOUSE RESORTS INC
CANTERBURY PARK HOLDING CORP	SHUFFLE MASTER INC	GLOBAL CASINOS INC
CHURCHILL DOWNS INC	WMS INDUSTRIES INC	HARRAHS ENTERTAINMENT INC
FLORIDA GAMING CORP		MGM MIRAGE
INTL THOROUGHBRED BREEDERS		MONARCH CASINO & RESORT INC
LITTLEFIELD CORP		PENN NATIONAL GAMING INC
MAGNA ENTERTAINMENT CORP		RIVIERA HOLDINGS CORP
MTR GAMING GROUP INC		STATION CASINOS INC
MULTIMEDIA GAMES INC		TRUMP ENTERTAINMENT RESORTS
PINNACLE ENTERTAINMENT INC		
YOUBET.COM INC		

Type 1: Other gaming (Horserace tracks, off-site betting, online casinos, and etc.)
Type 2: Casino machine manufacture
Type 3: Pure casino operation

VITA

Yeon Ho Shin

Candidate for the Degree of

Master of Science

Thesis: AN EXAMINATION OF THE SYSTMATIC RISK DETERMINANTS OF THE CASINO INDUSTRY

Major Field: Hospitality Administration

Biographical:

Personal Data: The son of Yongsik Shin and Yangsoo Park

Education: Completed the requirements for the Master of Science in Hospitality Administration at Oklahoma State University, Stillwater, Oklahoma in May, 2009.

Experience: Employed by Oklahoma State University, University Dining Services as a Dining Graduate Assistant, 2007 to present; Employed by Samsung Everland Food Culture Division as an Intern, 2004; Employed by Hanil Engineering Co.,LTD., 1999-2003.

Name: Yeon Ho Shin Date of Degree: May, 2009

Institution: Oklahoma State University Location: OKC or Stillwater, Oklahoma

Title of Study: AN EXAMINATION OF THE SYSTEMATIC RISK DETERMINANTS OF THE CASINO INDUSTRY

Pages in Study: 59 Candidate for the Degree of Master of Science

Major Field: Hospitality Administration

Scope and Method of Study: This study examined financial measures which are the determinants of systematic risk in the casino industry. Financial data was collected from 29 casinos in the U.S. in the period of 2002 through 2006 for the multiple regression analysis using annual data set as previous empirical studies. In addition, one-way ANOVA and independent samples t-tests were conducted with quarterly data from 32 U.S. casinos.

Findings and Conclusions: In short, different casino managers in the different casino segments should use different financial strategies to reduce risk. Furthermore, casino investors should understand unique financial characteristics of different segments in the casino industry. In addition, casino managers should keep trying to attract customers with well-established plans and a wide range of activities to keep casinos from having a high-risk season.

ADVISER'S APPROVAL: Dr. Jerrold Leong