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Zheng Gu

Hyunjoon Kim

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DETERMINANTS OF RESTAURANT SYSTEMATIC RISK: A REEXAMINATION

Zheng Gu

and

Hyunjoon Kim

ABSTRACT

This study reexamines determinants of the systematic risk or beta of restaurant firms based on the financial data of 75 U.S. restaurant firms from 1996 through 1999. Our weighted least-squares regression analysis found that restaurant systematic risk correlated negatively with assets turnover but positively with quick ratio. The findings suggest that high efficiency in generating sales revenue helps lower the systematic risk, while excess liquidity tends to increase the risk.

Introduction

The capital assets pricing model (CAPM) (Lintner, 1965; Sharp, 1963 & 1964) demonstrates that stock return is a function of a firm's systematic risk or beta. This risk determines the expected return that a potential investor requires from his investment in the firm's stock. The higher the risk, the greater the expected return. The purpose of this study is to investigate the determinants of restaurant firms' systematic risk. A sound knowledge of the systematic risk of restaurant firms will help investors better understand the risk nature of their investment. For restaurant executives, understanding determinants of the firm's beta would enable them to implement policies and strategies that can reduce risk and enhance firm value, thus maximizing the wealth of shareholders. A restaurant firm's operating, investing, and financing policies can affect its business and financial risks and eventually its systematic risk. As Mao (1976) points out, it is essential that the executives of a firm control financial and business risk variables that affect the company's systematic risk. Breen and Lerner (1973) contend that changes in a firm's financing, investing, and operating decisions can alter its stock's return and risk characteristics, its systematic risk in particular. An increase in the systematic risk will decrease the firm value and vice versa. Therefore, beta, the market-related risk of a firm's common stock, links corporate behavior with the market value of a company's stock. Although alternative theories of capital assets pricing have been proposed since the advent of CAPM, CAPM remains the predominant theory for stock valuation in finance (Van Horne, 2001).

The importance of beta to firm value has prompted financial researchers to investigate the relationship between beta and the firm's financial variables. In the restaurant industry, Borde (1998) investigated the determinants of beta using financial data of 52 firms for the period 1992–1995. He found the firm's beta correlated positively with its liquidity and growth but negatively with its dividend payout and profitability. His study

also examined the relationship between the standard deviation of a restaurant stock, representing the total risk, and firm financial variables.

This study follows up on Borde's (1998) study on restaurant firms' risk determinants but concentrates on their systematic risk or beta, since systematic risk is regarded as the only relevant risk in stock pricing within the framework of CAPM (Van Horne, 2001). There are several reasons that justify our current study to reexamine the beta determinants of restaurant firms. First, important changes in both operations and capital markets for the restaurant industry occurred after 1995. From 1992 to 1995, the restaurant industry experienced steady growth in its recovery from the 1991 economic recession. For the 52 sample firms used in Borde's study, average annual growth in earnings before interests and taxes (EBIT) during the sample period 1992–1995 was 4.94 percent and the mean return on assets (ROA) was 5.12 percent. In contrast, the 75 restaurant firms used by this study for the 1996–1999 period experienced an average annual decline in EBIT of 18.7 percent and a mean ROA ratio of negative 3.6 percent (See Table 1). Concurrent with the worsening growth and poor profitability, the restaurant sector has been out of favor in stock markets after the mid-1990s (Mehegan, 2001). Beta determinants may change as operation and capital market conditions change (Levy & Sarnat, 1984). Reexamining the beta determinants in the wake of those changes may reveal the impact of the changed market conditions on the systematic risk of restaurant firms. Second, the restaurant industry underwent significant restructuring since 1995. Among the 52 sample firms used by Borde's study, 21 were non-existent by 1999, because of either bankruptcy or mergers and acquisitions. The current study used an updated sample that was much larger than Borde's sample. Among the 75 sample restaurant firms used by the current study, 44 were not included in Borde's sample. Furthermore, this study excludes non-restaurant firms such as Host Marriott Corp and Marriott International, Inc., two hotel companies included in Borde's study, from the sample. A purer and updated sample of restaurant firms should enable this study to identify the determinants of restaurant systematic risk more accurately. Finally, two variables, firm size and operating efficiency, were not examined by Borde as candidates for beta determinants. The two variables were found to be important beta determinants by many previous studies (Kim, Gu & Mattila, 2002; Gu & Kim, 1998; Ang, Peterson & Peterson, 1985; Patel & Olsen, 1984; Lev & Kunitzky, 1974; Breen & Lerner, 1973; and Logue & Merville, 1972). This study increased candidate variables to include all the five ratios used by Borde plus firm size and operating efficiency in its attempt to identify beta determinants for restaurants. Using a more recent data set with a much larger sample and a wider range of candidate variables, this study should help hospitality researchers and practitioners better understand restaurant systematic risk and its determinants under new operating and capital market conditions.

Previous Studies on Beta Determinants

According to the CAPM theory (Lintner, 1965; Sharp, 1963 & 1964), there are two types of risks of a firm or its stock. The first is systematic risk or market-related risk. It is a stock's volatility due to the market's volatility or the covariance of a stock's return with

that of the capital market, denoted as beta. The second is unsystematic risk or the stock volatility that is caused by firm-specific events. For shareholders, firm-specific volatility or unsystematic risk can be reduced via diversification. Market-related systematic risk or a stock's covariance with the market cannot be diversified away. Even if a hypothetical shareholder holds a portfolio consisting of all stocks in the market, s/he will still face the market risk due to market events, such as recession, elections, and inflation. The non-diversifiability of the systematic risk determines that it should be priced on the capital market. High systematic risk needs to be compensated by high return. Because unsystematic risk can be diversified away, investors need not be compensated for it. Consequently, unsystematic risk is not a relevant factor in determining the investor's required return in the CAPM theory.

To identify the determinants of systematic risk or beta, previous studies have focused on the relationship between beta and liquidity, debt leverage, operating efficiency, profitability, dividend payout, firm size, and growth. Most of the empirical studies used multiple regressions with beta as the dependant variable and firm financial ratios as independent variables.

Competing theories exist regarding how liquidity affects systematic risk. Jensen (1984) supports a positive relationship between a firm's liquidity and systematic risk, arguing that high liquidity may raise a firm's agency cost of free cash flow and hence its systematic risk. In contrast, Logue and Merville (1972) and Moyer and Chartfield (1983), postulating a negative relationship between the two, hold that high liquidity indicates low level of short-term liabilities and helps lower systematic risk. An early investigation of the correlation between current ratio and beta by Beaver, Kettler, and Scholes (1970) found current ratio negatively correlated with beta. However, empirical studies by Borde (1998), Rosenberg and McKibben (1973), and Pettit and Westerfield (1972) showed liquidity ratios positively associated with systematic risk. On the other hand, the studies of Gu and Kim (1998) and Logue and Merville (1972) failed to find any significant relationship between liquidity ratios and beta.

Many studies propose that debt leverage exposes shareholders to higher systematic risk (Kim et al., 2002; Borde, 1998; Amit & Livnat, 1988; Moyer & Chatfield, 1983). Empirical studies have unanimously supported a positive association between leverage and beta (Kim et al., 2002; Borde, Chambliss, & Madura, 1994; Amit & Livanat, 1988; Mandelker & Rhee, 1984; Rosenberg & McKibeen, 1973; Logue & Merville, 1972; Beaver et al., 1970). Melicher's (1974) findings showed that the beta/leverage relationship might be positive but nonlinear. In his study, when leverage increased, beta increased at an increasing rather than at a constant rate.

Logue and Merville (1972) hypothesize that operating efficiency exerts a negative influence on systematic risk. Firms with higher operating efficiency tend to generate higher profits and are thus associated with lower probability of failure and lower systematic risk. Gu and Kim (1998) examined 35 casino firms and concluded that high efficiency led to low systematic risk. The empirical results of Logue and Merville's study showed that beta was negatively correlated with assets turnover ratio in a linear pattern.

According to Logue and Merville (1972), high profitability lowers the probability of business failure, thus lowering a firm's systematic risk. Scherrer and Mathison (1996) also argue for a negative relationship between profitability and systematic risk. These authors propose that the stability of the cash flow from operation, which reduces the systematic risk, is determined by the ability to manage the property profitably. Using profit margin and return on assets as profitability ratios, Logue and Merville empirically showed that beta was negatively correlated with the two ratios. Borde's (1998) findings also supported the negative relationship. Melicher's (1974) regression analysis, however, found beta positively related to return on equity.

Financial theory holds that high dividend payout should have a negative impact on systematic risk, either because returns from dividends are perceived by investors to be more certain than returns through higher stock prices (Logue & Merville, 1972) or because high dividend payout implies low agency cost (Ang et al., 1985). Therefore, dividend payout is inversely associated with systematic risk. Many empirical studies confirmed the negative relationship between dividend payout and beta (Borde, 1998; Ang et al., 1985; Melicher, 1974; Rosenberg & McKibben; 1973; Breen & Lerner, 1973; Pettit & Westerfield, 1972; Beaver et al., 1970).

Theoretically, large firms tend to have low systematic risk because of their better ability to minimize the impact of economic, social, and political changes (Sullivan, 1978) or their market power that enables them to achieve superior profits unattainable in a more competitive environment (Ang et al., 1985; Moyer & Chatfield, 1983). The negative impact of size on systematic risk has been confirmed in a number of empirical studies, including those by Kim et al. (2002), Ang et al. (1985), Patel and Olsen (1984), Lev and Kunitzky (1974), Breen and Lerner (1973), and Logue and Merville (1972).

Fast growth is hypothesized to increase systematic risk of a firm. Logue and Merville (1972) contend that fast-growth firms may face great competition and are more sensitive to economic fluctuations. Idol (1978) points out that firms experiencing high growth are perceived by investors as possessing substantial risk. This hypothesis was first supported by Logue and Merville's test on the relationship between annual growth in total assets and beta. Borde (1998) found growth in EBIT positively related to restaurant beta, providing further support to the hypothesized relationship.

To reiterate, previous empirical studies on the relationship between beta and financial variables indicate that debt leverage and growth increase systematic risk, whereas operating efficiency, dividend payout, and firm size tend to reduce the risk. On the other hand, regarding the impact of liquidity and profitability on beta, empirical findings are inconclusive.

Data and Methodology

The data set used for this study encompasses 4 years from 1996 through 1999 and includes 75 publicly traded U.S. restaurant firms. All the financial data, including the betas of the sample restaurant firms, were obtained from the Research Insight file of the

COMPUSTAT database. According to the COMPUSTAT, the beta was obtained by regressing a firm's monthly stock return against a market return index. The regression slope is the estimated beta. The 75 firms were sorted out by the primary SIC code of 5812 representing "Eating and Drinking Places." To be included in the sample, the firms had to have available complete financial information needed for deriving this study's variables.

Seven variables commonly used in previous empirical studies on beta determinants were tested as potential determinants of beta. They were quick ratio (QR), equity ratio (EQR), return on assets (ROA), dividend payout ratio (DIV), EBIT growth (GRW), assets turnover (AT), and total assets (ASST). The first five were also used in Borde's (1998) study. Quick ratio, representing liquidity, was the sum of cash, marketable securities and accounts receivables divided by current liabilities. Equity ratio, a measure of leverage, was a ratio of total equity to total assets. Return on assets, which was net income divided by total assets, was a measure of profitability relevant to total investment. Dividend payout was a ratio of annual dividend payment to net income. EBIT growth was the annual percentage change in EBIT. Assets turnover ratio was total revenue divided by total assets, indicating the efficiency of using assets to generate sales revenue. Finally, total assets were used as the firm size variable. Each of the seven variables was quantified by its 4-year average value of the data period.

With restaurant beta as the dependant variable and the seven financial variables as the independent variables in a cross-industry multiple regression, the relationship between the seven variables and beta was examined. A common problem associated with regression using cross-industry data is that the regression model may suffer from heteroscedasticity, which violates the constant residual variance assumption of regression. To avoid this problem, weighted least-squares (WLS) regression procedure, as suggested by Kleinbaum, Kupper, and Muller (1988), was used. The weights were the reciprocals of the absolute values of the residuals from a first-path ordinary least-squares regression. Borde (1998) used the same WLS regression method.

Two WLS models were derived. First, a model including all the seven independent variables was established for an initial assessment of the role of each variable in the model. Second, forward selection regression method as proposed by Stevens (1986) was used to derive a refined model involving only significant variables. In a forward selection procedure, the first variable to enter the model is the one that has the largest correlation with the dependant variable y. If the variable is statistically significant, then the second variable with the largest semi-partial correlation with y is considered. If the second variable is significant, then a third variable with the next largest semi-partial correlation is considered, etc. At some stage, a given variable will not make a significant contribution to the prediction of y, and the procedure is terminated. In this study, the cutoff significance F value was selected at the level of 0.05.

Restaurant Beta Determinants

Table 1 is a summary of descriptive statistics of the beta and seven independent variables of the 75 sample firms. Noticeable differences in beta, ROA, GRW, and DIV were

observed between the current sample and that of the Borde's (1998) study. The mean beta of Borde's 52 sample firms, 1.30, was much larger than the mean beta of the current study, 0.52. The sample means of ROA and GRW of this study for the period 1996–1999, at –3.6 percent and –18.7 percent, respectively, were far worse than the previous study's 5.12 percent (ROA) and 4.94 percent (GRW) for the period 1992–1995. The mean dividend payout ratio (DIV) of this study, 5.1 percent, however, was higher than the previous study's 2.9 percent. It is possible that restaurant firms did not lower dividends in proportion to declining profits, thus enlarging the payout ratio. The substantially different means of those variables are suggestive of changed operation environments and capital markets for the restaurant industry after 1995.

Table 1
Descriptive statistics of variables

Variable	Mean	Std.	Minimum	Maximum
Beta	0.520	0.575	–1.311	1.691
QR	0.560	0.517	0.049	2.662
ROA	–0.036	0.254	–1.979	0.160
ASST ($million)	548.953	2,270.157	2.023	19,098.770
EQR	0.453	0.292	–0.861	0.911
GRW	–0.187	1.684	–8.969	4.221
AT	1.701	0.622	0.649	3.496
DIV	0.051	0.636	–3.508	3.853

Note: QR = quick ratio, ROA = return on assets, ASST = total assets, EQR = equity ratio, GRW = EBIT growth, AT = assets turnover, DIV = dividend payout ratio.

Table 2 presents the Pearson correlations among all variables. Between beta and the seven independent variables, assets turnover (AT) has the highest negative correlation, while quick ratio (QR) has the highest positive correlation. High positive correlations were also found between QR and EQR and between ROA and EQR. Therefore, multicollinearity among independent variables should be checked for the regression model.

Table 2
Pearson correlations between variables

	Beta	**QR**	**ROA**	**ASST**	**EQR**	**GRW**	**AT**	**DIV**
Beta	1.00							
QR	0.17	1.00						
ROA	0.00	0.05	1.00					
ASST	0.07	–0.06	0.10	1.00				
EQR	0.14	0.31	0.57	0.00	1.00			
GRW	0.03	0.08	0.13	0.04	0.02	1.00		
AT	–0.32	–0.21	0.05	–0.23	–0.22	0.08	1.00	
DIV	–0.03	–0.05	0.03	0.01	0.00	0.01	0.05	1.00

Note: QR = quick ratio, ROA = return on assets, ASST = total assets, EQR = equity ratio, GRW = EBIT growth, AT = assets turnover, DIV = dividend payout ratio.

Table 3 demonstrates the WLS regression model with all seven variables. As shown in the table, assets turnover (AT) is the dominant determinant of restaurant beta as indicated by its highest statistical significance level at –0.239. The negative sign of AT is consistent with previous studies (Gu & Kim, 1998; Logue & Merville, 1972), suggesting that faster assets turnover leads to lower restaurant beta. The other significant variable in the model is quick ratio, QR, but at a relatively lower significance level of 0.1. The sign of QR is positive, confirming the positive relationship between liquidity and restaurant beta found by Borde (1998). Restaurants with high liquidity are likely to have high systematic risk. The negative signs of ROA and DIV and the positive sign of GRW are all consistent with what were expected based on the financial theory about beta determinants. The signs of ASST and EQR are positive, inconsistent with what the financial theory has suggested. Those variables, however, are not significant at the 0.1 level in the model. Therefore, they should not be regarded as determinants of restaurant beta.

Table 3
WLS regression model with all variables

	Coefficient	t-statistic	VIF
Intercept	0.819	6.476***	NA
QR	0.088	1.301*	1.22
ROA	−0.153	−.854	1.54
ASST	0.001	0.146	1.14
EQR	0.154	0.919	1.48
GRW	0.020	0.891	1.04
AT	−0.239	−4.695***	1.19
DIV	−0.015	−0.747	1.06

Note: 1. QR = quick ratio, ROA = return on assets, ASST = total assets, EQR = equity ratio, GRW = EBIT growth, AT = assets turnover, DIV = dividend payout ratio.

2. * Significant at the 0.1 level, *** Significant at the 0.01 level, Sample size = 75, Adjusted R^2 = 0.288, Model F-statistic = 5.277 (Significant at the 0.001 level).

To arrive at a refined model that includes only significant variables to explain the variation in restaurant beta, forward selection procedure was used. Table 4 presents the refined model. Only AT and QR entered the model. The other five variables were excluded by the procedure because of their insignificant partial correlation with beta. The t-statistic of QR was much improved and the variable is significant at the 0.05 level in the new model. The adjusted R^2 value was raised to 0.315 from 0.288 of the original model, implying that the refined model with two variables explains about 32 percent of the variation in betas of restaurant firms. As indicated in the note of the table, the model with only the AT variable in the first forward selection was 0.285. Therefore, adding QR to the model raised the adjusted R^2 value by only 0.03. In other words, while AT explains 28.5 percent of the variation of restaurant beta, QR contributes an additional 3 percent explanation to the model. The variance influence factor (VIF) values in both models are well below 10, the cutoff VIF value indicating serious multicollinearity (Kleinbaum et al., 1988). Therefore, multicollinearity does not pose a problem in our regression analysis.

Like the study of Gu and Kim (1998), this study also found assets turnover a significant determinant of the firm's systematic risk, suggesting that high efficiency in using assets to generate revenue helps lower the risk. Unlike the Gu and Kim study, which found the systematic risk unaffected by firm liquidity in a significant way, our findings indicate that liquidity tends to lower the systematic risk. The inconsistency in the findings of the two studies is understandable. Gu and Kim's study used casino firms as the sample, whereas the current study investigated restaurant firms that have operating features quite different from casinos. The findings of the current study, however, do not fully confirm the results of Borde (1998) who also analyzed the determinants of restaurant beta. The differences between this study and the Borde study deserve a detailed discussion.

Table 4
Forward-selection WLS regression model

	Coefficient	t-statistic	VIF
Intercept	0.882	9.973***	NA
QR	0.125	2.046**	1.03
AT	−0.242	−5.186***	1.03

Note: 1. QR = quick ratio, AT = assets turnover.

2. *** Significant at the 0.01 level, ** Significant at the 0.05 level, Sample size = 75, Adjusted R^2 = 0.315, Model F-statistic = 17.976 (Significant at the 0.000 level), Adjusted R^2 for the model with only AT only = 0.285.

Comparison with Borde's (1998) Results

The findings of the current study are quite different from Borde's (1998) results. Borde's study identified four significant variables in his WLS regression model, namely liquidity (positive), dividend payout (negative), return on assets (negative) and EBIT growth (positive). In our WLS model, among the five candidate variables that were also tested in Borde's study, only liquidity (positive) remains significant. On the other hand, assets turnover, which was not used by Borde as a candidate variable, was found highly significant in our study.

There are several reasons that may explain the differences in the findings. First of all, the samples used in the two studies were quite different. The sample used in the current study, which contained 75 restaurant firms, was much larger than Borde's (1998) sample of 52 firms. Among the 52 firms used in the Borde study, only 31 restaurant firms remained in the sample of the current study. The majority of the sample firms of the current study, 44 restaurant firms, were not used by Borde. The restructuring of the restaurant industry and many new restaurant firms' initial public offerings (IPOs) since 1995 make our sample substantially different from that of Borde's study.

Second, the sample of the Borde (1998) study contained some non-restaurant firms such as Host Marriott Corp. and Marriott International, Inc., two hotel companies. His results could be distorted because of the presence of non-restaurant firms. Third, Borde's study did not include operating efficiency and firm size as candidate variables. The two variables have been theorized to have an impact on beta and were widely used in previous beta determinants studies. Therefore, the Borde model could have been insufficiently specified. Finally, as mentioned previously, important changes in both operations and capital markets for the restaurant industry have occurred since 1995. Concurrent with the worsening growth and deteriorating profitability, the restaurant sector has been out of favor in stock markets after the mid-1990s (Mehegan, 2001). Changes in operation and capital markets could have changed beta determinants (Levy & Sarnat, 1984).

Policy Implications for Restaurant Firms

The positive association between liquidity and beta identified in this study confirms Borde's (1998) conclusion that investors dislike excess liquidity in restaurant firms. Too much liquidity implies that available sources are not being invested in operating assets that may create higher return than cash or near-cash assets, thus increasing the risk of losing high-return opportunities. Jensen (1986) contends that high liquidity can increase the agency cost of "free cash flow" and raise the risk of wasteful use of cash assets. Therefore, to lower the beta and increase the firm value for their shareholders, restaurant firms should avoid holding too much cash and near-cash assets not needed for covering their short-term liabilities. If high-return opportunities are available, excess cash and near-cash assets should be invested. Otherwise, they should be distributed to shareholders as dividends (Borde).

A major new finding of this study is the dominant impact of assets turnover on restaurant beta. The highly significant and negative relationship between assets turnover and beta found in this study strongly suggests that using existing restaurant assets to generate more sales revenue is critical to lowering systematic risk of a restaurant firm. Gu and Kim (1998) found assets turnover to be the only significant determinant of casinos' beta. They concluded that effective use of existing casino assets was the key to lowering casino systematic risk. The same conclusion can be made for the restaurant industry. Many restaurant firms went bankrupt after 1995. Those firms include Furrs/Bishops, Inc., Flagstar Companies, Inc., Manhattan Bagel Company, Inc., Sizzler International, Inc., and Boston Chicken. According to Schwartz (1999), many restaurant chains simply expanded too quickly and consequently went bankrupt. In markets that are approaching saturation and where the competition is intensifying, restaurants' operating costs will increase dramatically, especially for new properties. Expansion by establishing more restaurant properties may subject firms to low profit margins and high default risk. Therefore, relying on existing properties to generate more sales revenue may reduce the risk as perceived by potential restaurant investors, thus lowering the beta and enhancing the firm value for existing shareholders.

Summary and Future Research

This study reexamines determinants of the systematic risk or beta of restaurant firms based on the financial data of 75 U.S. restaurant firms from 1996 through 1999. The WLS regression analysis found that restaurant firms' systematic risk correlated negatively with assets turnover but positively with quick ratio. The findings suggest that efficient use of existing restaurant assets is the key to risk reduction and firm value enhancement. The results of this study confirm Borde's (1998) finding that excess liquidity tends to raise the systematic risk and hence to lower firm value. For restaurant firm executives whose goal is to maximize the wealth of their shareholders, they may take their cues from the findings when formulating corporate strategies.

The adjusted R^2 of the refined model of this study, at 0.315, is very low, suggesting that there may be important variables missing from the model. Future studies are needed

to increase the explanatory power of the beta determinant model and identify more factors that may have an impact on restaurant firms' systematic risk. One possible factor that could be added to the model is the type of restaurant operation, which can serve as a proxy of business risk. In this study, the ROA, GRW, and ASST variables may not be the best measures of profitability, growth, and firm size, respectively. Future studies may use return on equity, sales growth or gross profits growth, and market capitalization as alternate variables to represent profitability, growth, and firm size in an attempt to increase the explanatory power of the model.

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Zheng Gu, Ph.D., is a Professor in the College of Hotel Administration at University of Nevada, Las Vegas. Hyunjoon Kim, Ph.D., is an Assistant Professor in the School of Travel Industry Management at University of Hawaii, Manoa.