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# Factors Impacting Capital Expenditures in the Quick Service Restaurant Industry

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**ABSTRACT**

The purpose of this article is to study the factors that impact capital expenditures in the quick-service restaurant industry. The authors hypothesize that growth opportunities, free cash flow, size, corporate earnings, economic conditions, and franchising status will have impact on the capital expenditures of quick-service restaurants.

This study analyzed capital expenditure and other financial data on quick service restaurants for the period 2006–2016. Results suggest that corporate earnings, size, cash flow, economic conditions, and franchising have a significant relationship with capital expenditures, while growth opportunities are not associated with capital expenditures. Specifically, a high degree of corporate earnings, large size, and a high degree of cash flow tend to be associated with a high degree of capital expenditures; while favorable economic conditions and franchising tend to be associated with a low level of capital expenditures.

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The purpose of this research is to identify the determinants of capital expenditures in the U.S. quick-service restaurant industry. While some research has examined the determinants of capital expenditures (CapEx) for the entire restaurant industry (Dalbor & Jiang, 2013), to our knowledge no research has focused specifically on the quick-service restaurant industry. This research may either confirm previous findings, or it may find something new given the size of the quick-service industry and the prevalence of the use of franchising (Roh, 2002). The scope of the quick-service industry is such that in 2014 total revenue from these restaurants was nearly $200 billion with more than 230,000 establishments (Statista, 2016).

Franchising is a very common feature of the quick-service restaurant industry. It is important to remember that when researchers gather data on the industry, they are examining the characteristics of the franchisor, not the franchisee. Thus, it may be the case that while a franchisor can require capital expenditures to be made, these will be paid for by the franchisee and not show up in the financial records of the franchisor. However, we cannot be certain that this is always the case and thus an examination of this practice may be fruitful.

A definition of a so-called quick-service restaurant is not easily found. Ryu, Han, and Jang (2010) differentiate between *quick service* and *quick casua*l by stating that while neither offer table service, quick casual offers higher quality food, better food choices, and a better dining atmosphere. In terms of capital expenditures, Dang (2007) refers to capital expenditures as spending on fixtures, furniture, and equipment (FF&E); however, these items are actually a subset of property, plant, and equipment (PP&E). FF&E are usually considered inside a building, while PP&E is often the building itself along with fixtures and equipment.

Firms that spend significant amounts of money for PP&E can be considered *capital-intensive* firms. Sen and Farzin (2000) define capital-intensive firms as ones that convert a lot of financial resources to fixed assets. This is particularly true for hotels and restaurants, where the assets are largely fixed (Schmidgall, Damitio, & Singh, 1997). While Lee and Qu (2011) examine the relationship between

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capital intensity and firm performance, they did not examine the determinants of capital intensity or expenditures. Furthermore, their research examines all publicly traded U.S. hotels and restaurants, not any particular segment in either industry.

The research on the benefits of capital expenditures to the value of the firm shows indeterminate results. Bates, Kahle, and Stulz (2009) argue that these expenditures are made in response to increasing demand and indicate the expectation of improved financial performance. McConell and Muscarella (1985) find that capital expenditure announcements produce excess stock returns for industrial firms. Alternatively, Opler, Pinkowitz, Stulz, and Williamson (1999) believe firms that make these expenditures are giving up on short-term returns in the hopes of producing yet-to-be achieved future results. In terms of expenditures on PP&E as opposed to those on research and development (R&D), Kothari, Laguerre, and Leone (2002) show that R&D expenditures produce far less certain future benefits than those on PP&E.

According to the data collected by the Stern School of Business at New York University, capital expenditures within the overall U.S. restaurant industry (not just the quick-service industry) has ranged between $6 and $8 million for the past 10 years. Spending increased slightly in 2015 to just more than $8 million. Figure 1 shows the U.S. restaurant industry CapEx from 2002 to present.

This article is organized in the following manner. The next section will discuss the extant hospitality literature regarding capital expenditures. Then, the data utilized and the methodology employed will be discussed. The results of the statistical analysis will be subsequently presented, and the article ends with conclusions and recommendations for future research.

## Literature review

Some research regarding capital expenditures has been done in the hospitality industry. The most recent study was completed by Dalbor and Jiang (2013), who examine the entire restaurant industry. They find that growth opportunities, cash flows, and firm size were significantly related to CapEx.

However, other research has used capital intensity or capital expenditures to explain firm performance (as opposed to investigating what motivates capital expenditures). Examples include Lee and Qu (2011), who propose a curvilinear relationship between capital intensity and firm performance for both hotels and restaurants. They find a significant relationship in the 2000s, but not in the 1990s. Hua et al. (2013) do not find a significant relationship between CapEx and firm outperformance during difficult economic times.

The fundamental basis for the factors affecting capital expenditures is related to the pecking-order theory of finance (Myers, 1977, 1984, 2001). This notion states that the preferred (i.e., least costly) method of financing is internal; that is, retained earnings. However, least costly does not necessarily mean easiest. This requires a firm to be successful and profitable in order to spend retained earnings. The second most preferred is outside debt. The interest tax deduction under the U.S. tax system is favorable. However, large firms may also find outside debt appealing in that debt service payments act as a monitoring agent on the free cash flow of the firm (Jensen, 1986). Finally, according to the pecking-order theory, the costliest in terms of return and time is new external equity. New stock issues require the effort and approval of outsiders in a lengthy process in which the typical firm engages infrequently.

### *The relationship between growth opportunities and CapEx*

Growth opportunities are a key metric in any industry, including the restaurant industry (Hua & Templeton, 2010). Kim, Woods, and Kim (2013) examine the U.S. restaurant industry during the years 1999–2010. They divide their sample into *cash rich* and *cash poor* firms and find that the cash poor firms tend to make more capital expenditures.

Koh, Lee, Basu, and Roehl (2013) examine the role of growth opportunities in the cross-listing of American restaurant firms onto the Frankfurt Stock Exchange in Germany. While they do not find a positive relationship between cross listing and firm growth opportunities, they do find a significant relationship between cross listing and *industry* growth opportunities. The measure they use for a proxy for growth opportunities is the

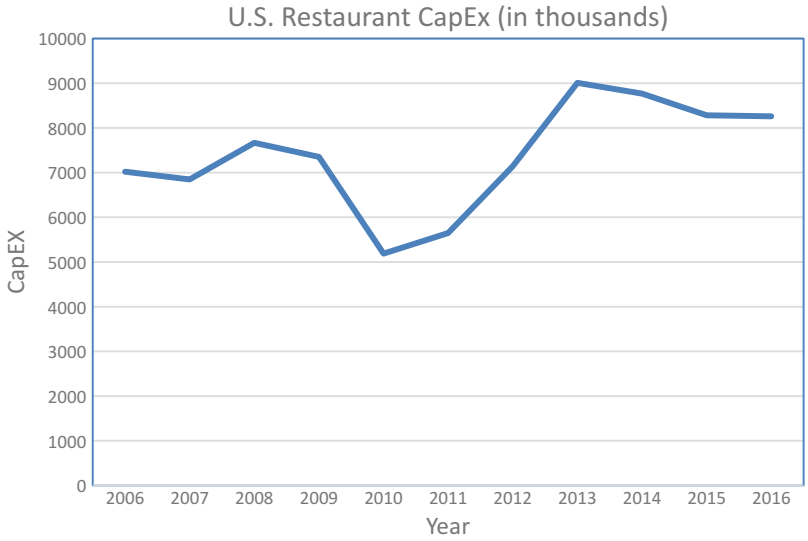


**Figure 1.** U.S. Restaurant Industry Capital Expenditures (in Thousands) from 2006 to 2016.
(*Source*: NYU Stern School of Business Data Page:http://people.stern.nyu.edu/adamodar/New_Home_Page/dataarchived.html.)

market-value-to-book-value ratio, otherwise known as the *q* ratio.[1]

One of the most interesting issues is whether the physical assets are owned by the franchisor or the franchisee. As this study examines the behavior of publicly owned franchisors, if capital expenditures are made by franchisees they would not appear in our data set. However, we believe that we will find in the quick-service industry the same relationship between growth opportunities and capital expenditures found by Dalbor and Jiang (2013).

Therefore, the first research hypothesis of this study is:

> Hypothesis 1: Growth opportunities have a positive impact on CapEx.

### The relationship between size and CapEx

It seems intuitive that firm size would be positively related to CapEx. This relationship was found to be positive and significant for the overall restaurant industry by Dalbor and Jiang (2013). We believe we will achieve a similar finding for the quick-service industry.

Furthermore, firm size has been commonly used as an important control variable in other hospitality research regarding the restaurant industry (Dalbor, Hua, & Andrew, 2014; Jung, Lee, & Dalbor, 2016). Accordingly, this prepares us to make the following research hypothesis:

> Hypothesis 2: The size of the firm has a positive impact on CapEx

### The link between corporate earnings and CapEx

Earnings (i.e., reported profits) are a significant statistic in any industry, including the restaurant industry. The long-term success of a firm can be attributed to the success or failure of its capital budgeting projects (Chatfield & Dalbor, 2005). Jiang, Chen, and Huang (2006) document a significantly positive association between capital expenditures and subsequent corporate earnings. Alternatively, the importance of earnings may be overstated. Hua and Templeton (2010) find no significant relationship between earnings and earnings growth the following year in the restaurant industry.

Agency theory states that agency costs may be incurred when managers and owners have conflicting interests (Jensen & Meckling, 1976). Managers may make decisions because of self-interest, and even invest in negative net present value projects. This implies a negative relationship between capital expenditures and future corporate earnings. Nevertheless, we hypothesize the following:

[1]The *q* ratio is calculated as the market value of a company divided by the replacement value of the firm's assets, also called the *market-to-book ratio*.

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Hypothesis 3:Corporate earnings have a positive impact on CapEx

### The relationship between free cash flow and CapEx

The emphasis on free cash flow is derived from Jensen (1986). Excess cash is more cash than is required to fund all positive net present value projects. This represents an agency problem between shareholders and managers. To control this problem, shareholders often ask for payouts to help monitor managers. However, not all firms engage in such payouts, and the two are not mutually exclusive.

In this regard, some confounding results have been found. Opler et al. (1999) find that firms holding a lot of cash make a high amount of capital expenditures. Alternatively, Kim et al. (2013) examine the restaurant industry and divide their sample between *cash-rich* firms and *cash-poor* firms. They find that cash-poor firms spend more on capital expenditures, because they rely more on borrowed funds than cash financing.

We believe there is a positive relationship between CapEx and free cash flow, which yields the following hypothesis:

Hypothesis 4: Free cash flow has a positive impact on CapEx

### The link between economic conditions and CapEx

Elsas, Flannery, and Garfinkel (2006) argue that acquisitions are typically made during strong economic times. These acquisitions are more representative of an external growth strategy. An internal growth strategy would be represented by capital expenditures. As found by Kim et al. (2013), cash-poor restaurant firms tend to make more capital expenditures. The presumption is that these firms are suffering from weak economic conditions. Lee and Xiao (2011) consider economic conditions when examining the relationship between capital intensity and restaurant firm performance.

Duggal and Budden (2013) find evidence that firms were cash hoarding during the recession of 2009. However, holding cash on the balance sheet does not necessarily indicate a lack of capital expenditures. They find that firms were raising equity and reducing dividend payments while continuing to make capital expenditures. Therefore, we expect a negative relationship between CapEx and strong economic conditions, as stated in the following hypothesis:

Hypothesis 5: Strong economic conditions have a negative impact on CapEx

### The link between franchising and CapEx

The relationship between franchising and capital expenditures is largely dependent on ownership. Denton (1998) examines the importance of capital expenditures to hotel properties. However, his perspective is that of a franchisee. An interesting life-cycle theory is proposed by Oxenfeldt and Kelly (1969). They argue that franchisors will eventually become wholly owned chains because of frustration with franchisee inefficiency and that franchise opportunities will eventually become exhausted. English (1996) studies the initial investments of franchised restaurants versus independents and finds that franchise restaurants invested more than seven times more than independents in long-lived assets. We believe that there is a positive relationship between firms that franchise and capital expenditures, as stated in the following hypothesis:

Hypothesis 6: There is a positive relationship between franchising and CapEx.

### Conclusion

Based on the literature examined, we will examine the relationship between CapEx and the following variables: growth opportunities, size, corporate earnings, free cash flow, economic conditions, and franchising. The next section describes the hypotheses to be tested, as well as the data used and methodology employed to test them.

## Methodology

### Sample

Data from Compustat (December, 2006–December, 2016) were used in this study. The selection of data

was based mainly on data availability, the reliability of data sources, and the ability to quantify variables in the modeling process. A total of 64 quick-service restaurants with 413 observations were included in the sample. A list of the restaurants sampled is presented in Table 1. Standardized difference of fit value (SDF), standardized difference in beta value (SDB), Cook's distances, and case-wise analysis were conducted to detect outliers. After removing outliers, 410 restaurant-year observations were used for the analysis.

## Variables

(1) Dependent variable

The dollar amount of capital expenditures (CapEx) is the dependent variable in this study. Following Brailsford and Yeoh's (2004) and Dalbor and Jiang's (2013) methods, the study uses a narrow definition of capital expenditures, which would include construction of a new plant, installation of a new plant, and upgrading an existing plant. However, it excludes assets acquired through mergers and takeovers.

(2) Independent variables

There are five independent variables (IVs) in Dalbor and Jiang's (2013) study: growth opportunities, cash flow, corporate earnings, economic conditions, and firm size. In the current study, since franchising was discussed and proposed as one of the independent variables in the previous section, the authors include all five independent variables and add one more—the franchising status of the firm.

Following previous researchers, growth opportunities (GO) are measured by the market-to-book (M/B) ratio (Brailsford & Yeoh, 2004; Dalbor & Jiang, 2013; Kim & Sorenson, 1986; Rajan & Zingales, 1995; Titman & Wessels, 1988). A firm's market-to-book ratio is measured using Compustat data, and is defined as the market value of equity at the end of the fiscal year divided by the book

**Table 1.** List of Restaurants Sampled

| |
|---|
| Applebees Intl Inc |
| Arcos Dorados Holdings Inc |
| Back Yard Burgers Inc |
| Bertucci's Corp |
| Bojangles' Inc |
| Brazil Fast Food Corp |
| Brinker Intl Inc |
| Buffalo Wild Wings Inc |
| Caribou Coffee Co |
| Carrols Restaurant Group Inc |
| Chanticleer Holdings Inc |
| Chipotle Mexican Grill Inc |
| Chuy's Holdings Inc |
| CKE Restaurants Inc |
| Cosi Inc |
| Cracker Barrel Old Ctry Stor |
| Darden Restaurants Inc |
| Del Friscos Resturnt Grp Inc |
| Del Taco Restaurants Inc |
| Dennys Corp |
| Diversified Restaurant Hldgs |
| Domino's Pizza Inc |
| Dunkin' Brands Group Inc |
| Einstein Noah Restaurant Grp |
| El Pollo Loco Holdings Inc |
| Famous Daves of America Inc |
| Fiesta Restaurant Group Inc |
| Fog Cutter Capital Group Inc |
| Friendly Ice Cream Corp |
| Frisch's Restaurants Inc |
| Giggles n' Hugs Inc |
| Good Times Restaurants Inc |
| Grey Fox Holdings Corp |
| Habit Restaurants Inc (The) |
| J. Alexander's holdings inc |
| Jack in the Box Inc |
| Jamba Inc |
| Kona Grill Inc |
| Lubys Inc |
| Max & Ermas Restaurants |
| McDonald's Corp |
| Meritage Hospitality Group |
| Mexican Restaurants Inc |
| Morgans Foods Inc |
| Nathan's Famous Inc |
| Noodles & Co |
| Nutrition Mgmt Svcs -CL A |
| Organic to Go Food Corp |
| Panera Bread Co |
| Papa Johns International Inc |
| Papa Murphy's Holdings Inc |
| Potbelly Corp |
| Red Robin Gourmet Burgers |
| Restaurant Brands Intl Inc |
| Rubio's Restaurants Inc |
| Ruby Tuesday Inc |
| Shake Shack Inc |
| Sonic Corp |
| Star Buffet Inc |
| Starbucks Corp |
| U-Swirl Inc |
| Wendy's Co |
| Yum Brands Inc |
| Zoe's Kitchen Inc |

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value of equity (equation 1). The book value of equity is defined as total assets (AT) minus total liabilities (LT). We exclude firms with book-to-market ratios of less than 0.01 and greater than 100. The use of this proxy is consistent with prior research in the area (Fama & French, 1993, 1996) and elsewhere.

$$\begin{aligned}\text{Market to Book ratio} &= \text{Market value/Book value} \\ &= \text{MKVALT}/(\text{AT} - \text{LT})\end{aligned} \tag{1}$$

Corporate earnings (E) are measured using the ratio of the firm's earnings before interest and taxes at the end of the year. This amount is then standardized by the amount of firm assets, which yields the return on asset ($ROA_{i,t}$) ratio. More specifically, the calculation of this variable is the ratio of firm *i*'s earnings before interest and taxes reported at the end of year *t*, to the level of total assets reported at the beginning of year *t*, $TA_{t-1}$.

Free cash flow firms, by definition, are those firms operating with high cash flow in a low growth environment (Jensen, 1986). As free cash flow is cash flow in excess of requirements, high cash flow alone is not a sufficient condition for free cash flow to be present, as a high cash flow firm may have a sufficiently large pool of positive NPV investment projects. Hence, a low-growth environment is also necessary. Thus, cash flow is used as an independent variable.

Cash flow (CF) is calculated using the approach of Lang et al. (1991) as follows:

$$\text{CF} = \text{EBIT} + \text{DP} - \text{TXT} - \text{DVT} - -\text{INT} \tag{2}$$

where EBIT is earnings before interest and tax and extraordinary items, DP is depreciation expense, TXT is total tax expenses, DVT is total dividend paid on ordinary and preferred shares, and INT is total interest expenses.

Economic conditions (Eco) are coded as 0 if the data were collected in 2007–2009, which covers the years of the U.S. economic recession (Johnson, Sage, & Mortimer, 2012), or 1 otherwise. The size of the firms are measured by the total assets. Franchising status (Fra) is coded as 0 if the firm is not for franchising, or 1 otherwise.

As a result, the relationship between capital expenditures in the U.S. restaurant industry and the determinants is stated as:

$$\begin{aligned}\text{CapEx} &= \text{f}(\text{GO}, \text{Size}, \text{E}, \text{CF}, \text{Eco}, \text{Fra},) \\ &= \alpha_0 + \alpha_1 GO_{it} + a_2 Size_{it} + \alpha_3 E_{it} \\ &\quad + \alpha_4 CF_{it} + a_5 Eco_t + a_6 Fra_{it} + e_i\end{aligned} \tag{3}$$

Where:

$CapEx_{it}$ = Total capital expenditures for firm *i* in year *t*

$Size_{it}$ = Restaurant size for firm *i* in year *t*

$GO_{it}$ = Growth opportunities for firm *i* in year *t*

$E_{it}$ = Earnings (ROA) for firm *i* at the end of year *t*

$CF_{it}$ = Cash flows for firm *i* in year *t*

$Eco_t$ = Economic conditions in year *t* (0 = economic recession year, 1 = otherwise)

$Fra_t$ = Franchising or not for firm *i* in year *t* (0 = not franchising, 1 = franchising)

*ei* = the error term of the regression

*t* = years 2006 through 2016

In the previous model, CapEx served as the dependent variable, while other variables served as the independent variables for the model in equation 3.

### Assumptions check for multiple regression analysis

In order to run the multiple regression analysis properly, several assumptions were examined. First, the linearity and multicollinearity (tolerance value and variance inflation factor) of the relationship between CapEx and the independent variables was examined through residual plots; second, heteroscedasticity was checked through a statistical diagnosis to make sure there was no assumption violations for the presence of unequal variances; third, independence of the error terms was examined to ensure each predicted value is independent; last, normal probability plots were used to check the normality of the error term distribution. All assumptions were met and the data are good for analysis.

### Data analysis

In the study, data were analyzed in three stages. First, the descriptive statistics showed us an overall view of the key variables. Second, Pearson correlation analysis was used to measure the linear dependence between the variables. Finally, a multiple regression method was employed to identify what factors were related to the capital expenditures of the restaurants.

## Data results

### Descriptive statistics

Summary statistics of key variables are reported in Table 2. The final sample consists of 410 quick-service restaurant firm-year observations from 2006 to 2016. Variables include growth opportunities (measured by the market-to-book ratio), firm size (measured by total assets), earnings (measured by return on assets), cash flows, economic conditions, and franchising status.

CapEx of the quick service restaurants in the sample ranged from $0 to $2,729.8 million, with an average of $89.96 million. This is more than two times higher than the data ($37) reported in the Dalbor and Jiang (2013) article, which covers all kinds of restaurants, including full-service, quick-service, and others. The average size of the restaurants was $1,126.1 million, which ranged from $0 to $32,989.9 million. The return on assets ranged from −150% to 41%, with an average of .4%. Most of the restaurants in the sample were involved with franchising ($N$ = 344, 84%), while only 66 (16%) of them were not franchising.

**Table 2.** Summary Statistics

| Variable | Obs | Mean | *SD* | Min. | Max. |
|---|---|---|---|---|---|
| CapEx | 410 | 89.96 | 256.207 | 0 | 2729.800 |
| M/B | 410 | 4.222 | 39.538 | −296.913 | 551.693 |
| Size | 410 | 1128.768 | 3226.176 | 1.420 | 32989.900 |
| ROA | 410 | 0.004 | .197 | −1.509 | .410 |
| CF | 410 | 127.261 | 384.395 | −241.200 | 3996.900 |
| Eco | 410 | 0.48 | .50 | 0 | 1 |
| Fra | 410 | 0.84 | .37 | 0 | 1 |

CapEx is the total capital expenditures, in millions of dollars; M/B is the market-to-book value, and is calculated by dividing market value by total assets minus total liabilities; Size is equivalent to total assets; ROA is return on assets, and is calculated by dividing earnings before interest and taxes by total assets; CF is cash flow, and is calculated by taking earnings before interest and taxes, adding depreciation expense, and subtracting taxes, dividends, and interest expense; Eco is an economic condition indicator variable where it is 0 if the data were collected in 2007–2009, which indicates economic recession years in the United States, or 1 otherwise; Fra is an indicator variable with 0 for firms with no franchising and 1 for firms that do franchise.

**Table 3.** Intercorrelations for Capital Expenditure and Six Other Financial Indexes

| Measure | CapEx | M/B | ROA | Size | CF | Eco | Fra |
|---|---|---|---|---|---|---|---|
| CapEx | — | | | | | | |
| M/B | 0.036 | — | | | | | |
| | (0.470) | | | | | | |
| ROA | 0.195** | 0.034 | — | | | | |
| | (0.000) | (0.490) | | | | | |
| Size | 0.910** | 0.021 | 0.168** | — | | | |
| | (0.000) | (0.668) | (0.001) | | | | |
| CF | 0.991** | 0.038 | 0.209** | 0.902** | — | | |
| | (0.000) | (0.446) | (0.000) | (0.000) | | | |
| Eco | 0.012* | −.106* | −0.040 | 0.027 | 0.030 | — | |
| | (0.009) | (0.031) | (0.423) | (0.579) | (0.544) | | |
| Fra | 0.114* | −0.002 | −0.004 | 0.113* | 0.117* | −0.015 | — |
| | (0.021) | (0.960) | (0.939) | (0.023) | (0.018) | (0.763) | |

$p$ values are reported in parentheses.
*$p < 0.05$; **$p < 0.001$.
CapEx is the total capital expenditures, in millions of dollars; M/B is the market-to-book value, and is calculated by dividing market value by total assets minus total liabilities; CF is cash flow, and is calculated by taking earnings before interest and taxes, adding depreciation expense, and subtracting taxes, dividends, and interest expense; ROA is return on assets, and is calculated by dividing earnings before interest and taxes by total assets; Size is equivalent to total assets; Eco is an economic condition indicator variable where it is 0 if the data were collected in 2007–2009, which indicates economic recession years in the United States, or 1 otherwise; Fra is an indicator variable where 0 is no franchising and 1 is franchising.

Pearson correlation analysis results are provided in Table 3. ROA, Size, CF, Eco, and Fra were significantly associated with CapEx. M/B was not significant.

To identify what factors were related to restaurant CapEx, a multiple regression method was employed. As stated previously, the dependent variable was CapEx. Growth opportunities (measured by the M/B ratio), Size (measured by total assets), corporate earnings (measured by ROA), cash flow (CF), economic conditions (Eco), and franchising status (Fra) were used as independent variables. Multicollinearity was assessed, and we found that Size had a fairly large variance inflation factor (VIF > 3), which violates the assumption to run regression analysis. Thus, we removed Size from the model, but a simple regression was conducted to test Hypothesis 2. In Table 4, unstandardized coefficients (B), standard error of unstandardized coefficients (SE B), standardized coefficients (β), and $t$ statistics (t) are reported.

As shown in Table 4, a regression model consisting of ROA, CF, Eco, and Fra significantly

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**Table 4.** Regression Analysis Summary for Financial Variables Predicting Capital Expenditure ($N$ = 410)

| Predictor | B | SE B | β | *t* |
|---|---|---|---|---|
| Constant | 11.865 | 4.430 | | 2.586** |
| M/B | −.021 | .042 | −.003 | −.508 |
| ROA | 17.075 | 8.555 | .013 | 1.981* |
| CF | .614 | .010 | .922 | 63.538** |
| Eco | −9.634 | 3.313 | −.019 | −2.908** |
| Fra | −2.127 | 4.345 | −.003 | −1.979* |

*$p < 0.05$; **$p < 0.001$.

*Notes:* $R^2$ = 0.826; Adj $R^2$ = 0.823.

B represents unstandardized coefficients; β represents standardized coefficients. Regression Model Tested: CapEx $= a_0 + a_1 GO_{it} + a_2 Size_{it} + a_3 E_{it} + a_4 CF_{it} + a_5 Eco_t + a_6 Fra_{it} + e_i$

CapEx is the total capital expenditures, in millions of dollars; M/B is the market to book value, and is calculated by dividing market value by total assets minus total liabilities; Size is equivalent to total assets; ROA is return on assets, and is calculated by dividing earnings before interest and taxes by total assets; CF is cash flow, and is calculated by taking earnings before interest and taxes, adding depreciation expense, and subtracting taxes, dividends, and interest expense; Eco is an economic condition indicator variable where it is 0 if the data were collected in 2007–2009, which indicates economic recession years in the United States, or 1 otherwise; Fra is an indicator variable with 0 for firms with no franchising, and 1 for firms that do franchise.

predicted the CapEx of U.S. quick-service restaurants. Hypotheses 3, 4, and 5 were supported, while hypotheses 1 and 6 were rejected. Hypothesis 2 was also supported by the result of the simple regression analysis, in which Size ($p < 0.001$, Adj. $R^2$ = 82) was used as the single explanatory variable. It is interesting that the results showed that franchising has a negative relationship on CapEx, which is the opposite of what we expected. The regression model indicates that ROA ($p$ = 0.0483), CF ($p < 0.001$), Eco ($p < 0.001$), and Fra ($p$ = 0.0485) contributed to the prediction of CapEx. The adjusted $R^2$ was 82% (Adj. $R^2$ = 82.3), and the overall $F$ test for regression relation was 4279.8, highly significant at $p < .001$. ROA and CF have positive impacts on CapEx, while Eco and Fra have negative impacts on CapEx. Therefore, the mean response regression equation for U.S. restaurant CapEx is estimated to be:

$$Y_{CapEx} = 11.856 + 17.075\ ROA + 0.663\ CF - 9.634\ Eco - 2.127\ Fra + e$$

## Conclusions and discussion

The purpose of this research is to identify the determinants of capital expenditures in the quick-service restaurant industry in the United States. The results of this study suggest that corporate earnings, size, cash flow, economic conditions, and franchising have a significant relationship with capital expenditures, while growth opportunities are not associated with capital expenditures. To be specific, a high degree of corporate earnings, large size, and a high degree of cash flow tend to be associated with a high degree of capital expenditures, while favorable economic conditions and franchising tend to be associated with a low level of capital expenditures.

The findings of this study may not be prescriptive for industry practitioners. However, they may provide them insight into recognizing that industries such as the hospitality industry, and the particular strata in which they operate, may have different determining characteristics from other industry segments. Thus, researchers may investigate other hospitality segments, such as hotels and casinos, to determine whether particular industry segments have different motivations for making capital expenditures. What follows is a discussion of each of the factors we examined.

### *Free cash flow*

According to the discounted cash flow (DCF) model, the value of a company is equivalent to the present value of its future cash flows. That is to say, the value of a company is the future estimated cash flow discounted at a rate that mirrors the risk of cash flow (Copeland, Koller, & Murrin, 1994). Unlike accounting measures such as earnings, DCF conceptualizes the importance of projected cash flows and the time value of money. Free cash flow reflects the difference between cash inflows and outflows from operating units. These cash flows are relevant for projecting firm value because they represent the cash available for a firm's financial obligations, such as debt and dividends (Rappaport, 1998). Thus, in terms of quick-service restaurant capital expenditures, the accurate identification of a target's cash-flow generation capability is crucial to the financial managers.

The results from this study show that cash flow is positively associated with capital expenditures; this is consistent with Brailsford and Yeoh's (2004) and Dalbor and Jiang's (2013) findings.

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### Corporate earnings and size

As stated in Chatfield and Dalbor's (2005) study, the long-term success of a firm can be attributed to the success or failure of its capital budgeting projects, and the results show that both corporate earnings and firm size are associated with capital expenditures. This result is consistent with previous research (Jiang et al., 2006; Kerstein & Kim, 1995). The results suggest that quick-service restaurants that have higher corporate earnings and larger size tend to have more capital expenditures.

### Economic conditions

As for the impact of the most recent economic recession on capital expenditure, the results indicate that quick-service restaurants tended to increase their capital expenditures during the recession. This finding is also consistent with that of previous research (Elsas et al., 2006), which shows that these expenditures are more common during weaker economic conditions.

### Franchising

As discussed earlier, the relationship between franchising and capital expenditures is largely dependent on ownership. There is limited research studying the relationship between franchising and capital expenditures. A recent national poll found that 58% of surveyed franchisees reported being required to make major capital investments. However, half of them did not believe that the investments had improved their bottom line (Wearemainst.com, 2015). The result of this study suggests that quick-service restaurants that are not franchising tend to have more capital expenditures. One potential explanation is that most of the observations in the sample involved franchising (84%). This result may have been different if more non-franchising quick-service restaurants were included in the sample.

### Growth opportunities

The results of this study indicate that growth opportunities are not associated with capital expenditures. Although this result does not meet the authors' expectation, it is consistent with the results from Koh et al. (2013). It appears that in the quick-service restaurant industry, growth opportunities have no or limited influence on the amount of capital expenditures. Further investigation may be needed to find out the reason why growth opportunities have no influence on capital expenditures.

## Limitations and future research

This research attempted to investigate the determinants of capital expenditures of quick-service restaurants in the United States. While positive empirical results have been obtained, there are some limitations in the current study. First, due to data availability, this research analyzes data for only 64 restaurants (410 observations). Naturally, a future study could examine a larger data set to see whether the included independent variables still significantly affect quick-service restaurant capital expenditures. Second, the franchising variable has two levels, but the two groups were not equal in size, which could be improved in a future study (i.e., include more non-franchising restaurants in the sample). Third, this article primarily focuses on quick-service restaurants. It is reasonable to believe that other sectors of the hospitality industry may not have the same results.

Further research on this topic may include, but should not be limited to, comparing the capital expenditures of restaurants across countries (i.e., the U.S. vs. Asian countries). Additionally, more factors may be included when studying the determinants of capital expenditure decisions.

## Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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