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Arun Upneja
The Pennsylvania State University, null@psu.edu

Amit Sharma
The Pennsylvania State University, null@psu.edu

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Abstract
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Keywords
investments, restaurants, Publicly Traded, Stock Market, Cash-flow

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By Arun Upneja and Amit Sharma

This research investigated the relationship between investments in fixed assets and free cash flows of U.S. restaurant firms while controlling for future investment opportunities and financial constraints. It also investigated investment and cash-flow sensitivity in the context of economic conditions. Results suggested that investments in small firms (with higher financial constraints) had relatively weaker sensitivity to cash flows than investments in large firms (with higher sensitivity). Controlling for economic conditions did not significantly change results. While the debate over sensitivity of investments to cash flows remains unresolved, it has not been explored widely in industry contexts, especially in services such as the restaurant industry. In addition to its contribution to this literature, this paper provides implications for cash-flow management in publicly traded restaurant companies.

INTRODUCTION

Relatively few studies in hospitality literature have addressed factors impacting firms' investment in fixed assets (such as equipment and facilities), especially cash flows. This issue is of critical importance for both theory building and managerial decision-making with regard to finance. For instance, firms can use either internal sources, such as free cash flows, for investments or they can use external sources. Because of their lower cost, internal sources of capital are generally preferred over external sources of capital (Myers & Majluf, 1984). However, firms' performance and their ability to generate internal, free cash flows complicate this picture. For instance, despite opportunities for expansion, some firms may not have enough free cash flows; therefore, they may have to seek external funding (due to internal financial constraints). Therefore, firms have to approach the capital market for funding. The purpose of this research was to investigate whether investments in publicly traded restaurant firms are sensitive to free cash flows in the context of firms' financial constraints (in the context of access to capital markets for external funding).

The restaurant industry presents an interesting setting for such research. Anecdotal evidence suggests that restaurants usually require high operating cash flows (the authors were unable to identify prior research that could be cited to support this generally accepted view). Understanding the impact of such cash-flow

requirements for investment activity could lead to critical insights for managerial decision-making. We expect that restaurant firms with higher financial constraints (those with relatively limited access to external funding) have higher investment sensitivity to free cash flows. Other variables that previous literature has investigated, such as firm size and future investment opportunities, were also investigated in this paper. Restaurant business is also impacted by the overall economic conditions (Arbel, 1983). We therefore also looked at how aggregate changes in economic conditions measured as changes in the growth of gross domestic product (GDP) impacted the relationship between investment behavior and cash flows. Findings of this paper were compared with key results of previous studies to understand differences in the restaurant industry. This paper also discusses the potential impact of research findings on industry practice.

LITERATURE REVIEW

Investment Decisions

Firms' investment decisions have been of interest to researchers from various perspectives. Modigliani and Miller (1958) suggested that the financial status of a firm was irrelevant in determining its investment behavior. However, since then, evidence has emerged to suggest that capital markets are either imperfect or incomplete when the cost of external capital is higher than that of internally available funds (Cleary, 2006). Fazzari, Hubbard, and Petersen (1988) pointed out that, through their cost of capital, most investment models were based on the assumption that firms were able to respond to the prices set by the centralized securities market. An alternative way of analyzing investments was to emphasize the importance of internal cash flows due to their relatively lower costs versus external funds. This approach led to the emergence of the literature that has analyzed correlations between cash flows and investments. Recent imperfections discovered in debt and equity markets have given further credence to this notion that firms that do not have access to external markets must mostly rely on internal sources of funds.

Investments and Cash Flows

The research surrounding cash flows and their impact on investment decisions emerged around 20 years ago with Fazzari et al. (1988). The evidence so far is not conclusive on whether financially constrained firms have higher or lower sensitivity to free cash flows. In fact, further issues have been raised. The paper by Fazzari et al. (1988) marks the beginning of this discussion (and controversy) that later emerged regarding the cash flows/investments correlation. Their investigation revealed that cash flows are indeed correlated to investments and that this correlation is particularly stronger in those firms that are financially constrained. Kaplan and Zingales (1997) challenged this latter finding of stronger correlation in financially constrained firms. They based their investigation on the results of Fazzari et al. (1988), which showed an almost inverse relationship: Firms that were less financially constrained had higher correlation between investments and cash flows versus those that had higher financial constraints. Kaplan and Zingales emphasized that higher cash-flow sensitivities could not be interpreted as evidence that firms were financially constrained. Later Fazzari et al. (2000) admitted that cash flow/investment sensitivity was indeed lower in financially constrained firms; however, they disagreed with a theoretical framework proposed by Kaplan and Zingales (1997) to explain the correlation between financial constraints and cash flows. This discussion has since continued (Kaplan & Zingales, 2000). Numerous other investigations have attempted to explain possible correlations between cash flow/investment sensitivities. Hubbard (1998) presented an overview of this literature and the underlying theoretical arguments.

Hubbard et al. (1995) conceptualized the tests that led to other studies investigating the relationship between investments and internal funds. First, they formulated a null hypothesis of frictionless markets using the Euler equation for intertemporal capital accumulation. Second, they proposed a test to investigate the free cash flow and investment correlation based on firm "maturity." Finally, they formulated an alternative model in which the cost of funds depended upon firm-specific cash flow and a

measure of the aggregate credit conditions. More recently, D'Espallier et al. (2008) compared the ability of the cash-flow sensitivity of the investment model with that of the cash-flow sensitivity of the cash model to discriminate between financially constrained and unconstrained firms. The results of this study showed that the cash-flow sensitivity of the investment model was superior in this discrimination ability, at least for a sample of small and medium enterprises in Belgium.

These early papers paved the way for more recent discussions and investigations surrounding firms' cash flows. Carroll and Griffith (2001) focused on the use of free cash flows for the acquisition of new assets. This study investigated whether firms that had excess financial capacity in the form of free cash flows and excess debt capacity tended to finance negative net present value (NPV) assets. Results of this study suggested that "white knight" firms, the ones that are usually likely to be more careful in investing activities, invested in assets that generated negative NPV. The authors concluded that firms must therefore increase dividends and debt rather than invest in such assets. Similarly, Kholdy and Sohrabian (2001) examined the pecking order (PO) hypothesis and the free cash flow (FCF) theory in small, medium, and large firms. The evidence suggested that small-firm cash flows did not significantly affect their investments. However, the PO hypothesis was supported for this group of firms. Both the PO and FCF were supported for the medium-sized firms, and borrowing and debt levels of this group of firms were not influenced by their cash flows. Finally, the investment of large firms was influenced by their cash flows. However, their debt levels were independent of the cash-flow levels, suggesting that this group of firms borrows regardless of their internal cash flows. Dasgupta and Sengupta (2007) examined the level of investments by financially constrained firms in response to increases in their net worth and interest rate cuts. In addition to their other findings, the authors suggested that firms with very high and very low levels of cash flows towards the end of a recession would tend to increase investments faster than firms with intermediate levels of cash flows. This study also underscored previous findings that cash is more

valuable for financially constrained firms, and that response of investments to cash-flow shocks was non-monotonic.

Cash Flow Analysis in Diverse Contexts

Free cash flow's impact on valuation has also been of interest for researchers. Chen et al. (2001) examined the effect of investment opportunities and free cash flows on valuation in the context of announcing cross-border investments. While the results showed that investment opportunities had a significant positive response to such investment announcements, free-cash-flow effects could not be supported. This study also suggested an anomaly in the free-cash-flow theory of the firm. Del Brio et al. (2003) used panel data and event-study methodology to investigate the relationship between investment and firm value. The study found that the relationship between firm value and investment was direct but inversely proportional. Additionally, the study also found that high free-cash- flow firms that invested experienced a decrease in value. On the other hand, low free-cash-flow firms that invested experienced an increase in value. More recently, Chang et al. (2007) investigated the impact of free cash flows on stock valuation in the announcement of secured debt offerings. The study showed that while high investment opportunities tended to have a positive effect on stock valuation during the secured debt offering, the theoretical relationship with regard to free cash flows was not supported. The authors suggested that secured debt offering may provide an anomaly for the free-cash-flow theory proposed by Jensen (1986), and that free cash flows may not be important in this valuation affect.

Free cash flows have also been linked to governance. Moon and Tandon (2007) looked into the disciplinary role of leverage through ownership structure of the firm in the context of growth opportunities, to control for the overinvestment problem. The study found evidence to support their hypothesis that there was a significant association between equity ownership and leverage for low-growth firms; however, this was not so for high-growth firms. This study also found that firm size had an interaction affect. Most importantly, the results were consistent across firms'

growth opportunities: They were stronger for firms with low-growth opportunities.

While the investigation of free cash flows continues in increasingly related areas of firms' decision-making, governance, and valuation, the original argument about the sensitivity of investments to cash flows remains unresolved.

A recent study by Islam and Mozumdar (2007) in the international context further shows that sensitivity of cash flows to investments may differ significantly based on the contextual factors.

Cash Flow Sensitivity in Services

Few studies have investigated non-manufacturing sectors (Calem & Rizzo, 1995). Restaurant businesses are highly cash sensitive and therefore must focus on maximizing sales, customer traffic, and overall profitability (Singh, Upneja, & Dalbor, 2003). The general perception has been that restaurant businesses lack cash reserves and retained earnings to internally finance fixed assets (Upneja & Dalbor, 2001). However, very little is known about the investment behavior of such firms, especially when they may be constrained to source external funds.

Investment Opportunities and Economic Conditions

In assessing the sensitivity of investments in fixed assets with cash flows, a firm may find the existence or lack of investment opportunities can be an important intervening variable. For instance, if a firm has high investment opportunities, it is more likely to engage in investment activities, regardless of whether it has high or low levels of cash flows. The same argument could be posed with a counter argument in the case of a firm with low investment opportunities. Therefore, the effects of investment opportunities need to be controlled in assessing this investment-and-cash-flow relationship. Tobin's Q has over time become a well-accepted measure of a firm's investment opportunities (Lindenberg & Ross, 1981). It is defined as the ratio between the total market value of the firm and the book value of total assets. Tobin's Q has also been used in previous research to control for the firm's investment opportunities in the context of studying the relationship between investment in fixed assets and cash flows (Del

Brio et al., 2003; Chang et al., 2007; D'Espallier et al., 2008; Islam & Mozumdar; 2007).

Previous research in hospitality literature has studied the impact of economic conditions on industry performance (Arbel, 1983; Choi, 2007). The key indicators of economic conditions include Gross Domestic Product and the general business cycle (Choi, 2007). However, the use of these variables in the current context remains unexplored.

Summary of Literature Review

So far the research related to investment's sensitivity to cash flows remains inconclusive. Most of these investigations extend across different industrial sectors, and those that are not remain focused on the manufacturing sector. The predominantly service sectors, such as the restaurant industry, have not yet been studied in this context. The nature of service- product offering could require restaurant businesses to hold higher cash flows than other types of businesses. In general, this high dependence on cash flows could also make their investments sensitive to cash flows. However, so far there is no clear evidence based on prior research. In order to address this critical gap in hospitality literature, this research investigates the relationship between investment behavior of restaurant firms and their liquidity position in the context of their level of access to external sources of financing, what we call financial constraint. Improved understanding of firms' investment behavior also has implications for formulating public policies and recognizing factors that would influence competitiveness. This study will contribute to a systematic dialogue in this area from the perspective of the restaurant industry.

STATEMENT OF PURPOSE

In view of the current gap in this literature, the purpose of this study was to investigate the sensitivity of investments and cash flows in publicly traded restaurant companies in the context of financial constraints, investment opportunities, and economic conditions.

METHODOLOGY

The standard specification of modeling investment sensitivity to cash flow was taken from a previous study (Fazzari et al., 1988) and used as the basis of investigation in this paper:

$$\frac{I_t}{K_{t-1}} = \alpha + \beta Q_t + \gamma \frac{W_t}{K_{t-1}}$$

Where

It is investment in the current year

Kt-1 is the capital stock in the previous year

Qt is Tobin's Q as a proxy for the firm's future investment opportunities

Wt is the firm's cash flows in the current year.

Financial constraint has usually been measured by the percentage of dividend paid out by the firm to its current income. However, this measure has proved to be less practical in the case of the restaurant industry because most firms sampled in this study from the U.S. industry either did not pay dividends or, worse, had negative earnings. The size of the company is another method that has been used to measure financial constraints of a firm (Cleary, 2006). The argument is that smaller firms are usually more financially constrained than larger ones. We divided the entire sample into three size categories based on their log of total assets. We then labeled them as small, medium, or large. Although we recognize that this is arbitrary, there is no accepted definition of large firms and small firms. Size is a continuous variable, thus arbitrary cut-offs have to be established. Then four separate models were evaluated, one for all firms together and three for each of these categories. Parameter estimates were compared.

In order to control for the impact of economic conditions, change in Gross Domestic Product (CGPD) was introduced as a variable. GDP is an appropriate measure of aggregate economic activity and captures the impact of economic conditions of interest to this research (United States Department of Commerce, 2009).

The final model for each category of firms was as follows:

$$\frac{I_t}{K_{t-1}} = \alpha + \beta Q_t + \gamma \frac{W_t}{K_{t-1}} + \xi \frac{W_t \cdot size}{K_{t-1}} + CGDP$$

Where

It is the investment in the current year

Kt-1 is the capital stock in the previous year

Qt is Tobin's Q as a proxy for the firm's future investment opportunities

Wt is the firm's cash flows in the current year

CGDP is the change in GDP between the current year and the previous year

We used the standard procedure to de-trend the data series to avoid spurious co-variations by introducing a year variable.

Data

Financial data for U.S. restaurant companies were collected from COMPUSTAT North America and accessed using Wharton Research Data Service (WRDS). Capital stock was defined as COMPUSTAT #128, and investment was defined as COMPUSTAT # 37. We used the COMPUSTAT definition of free cash flow and estimated it as the sum of equity in net loss (#106), earnings before extraordinary items (#123), extraordinary items and discontinued operations (#124), depreciation and amortization (#125), and deferred taxes (#126). Tobin's Q was operationalized as market value of assets divided by book value of assets (#6). The market value of assets is calculated as book value of assets (#6) plus market value of equity (#25*#199) less the sum of book value of equity (#60) and deferred taxes (#74). This operationalization of Tobin's Q is commonly used and is identical to Kaplan and Zingales (1997). GDP numbers were downloaded from the Bureau of Economic Analysis of the United States Department of Commerce website (www.bea.gov/national/nipaweb). We started with data from the years 1995 to 2006. Initially we started with 3,276 firm-year observations. Because of data constraints, there were 1,420 firm-year observations in our final sample. Some firm-year observations

were dropped due to data unavailability, and some were dropped because of the need to calculate the ratios using data from the previous year. Therefore, the first year of firm-year observations was dropped. To account for this drop, we had planned to start with 11 years of data.

RESULTS

A summary of descriptive statistics is presented in Table 1. The mean yearly investment was about 21% of prior year capital stock. Predictably, some firms had considerably higher investment than the mean. There was even some retrenchment, as evidenced by the negative coefficient on the dependent variable. Tobin's Q values ranged from 0.51 to 11.27, with a mean of 1.7 and standard deviation of 1.11. Ratio of current-year cash flows to previous-year capital stock had a mean of 0.09 with a standard deviation of 0.35. A correlation matrix among the variables of interest is presented in Table 2. Because of multicollinearity, none of these correlations was high enough to confound results. The final data analysis resulted in two sets of models, the first without the economic control variable CGDP and the second with that control variable. Results of this analysis are presented in Tables 3 and 4.

Table 1
Descriptive Statistics

	N	Mean	Std Dev	Minimum	Maximum
DV	1190	0.21018	0.21476	-0.06128	1.77778
Qt	1085	1.70187	1.11273	0.51841	11.27027
WK1	1064	0.09241	0.35906	-3.28094	1.51673
CGDP	1220	0.05407	0.01093	0.03170	0.06610

DV is the dependent variable and is calculated as It/Kt-1
It is investments in current year
Kt-1 is the capital stock in the previous year
Wt is firm's cash flows in current year
WK1 is Wt/Kt-1
Qt is Tobin's Q as a proxy for firm's future investment opportunities
CGDP is the change in GDP between the current year and the previous year

Table 2
Pearson Correlation Coefficients

Variable	DV	Qt	WK1	Year	CGDP
DV	-	0.018452	0.05211	-0.11436	0.07661
Qt		-	0.06575	0.11608	0.05608
WK1			-	0.04661	0.04050
Year				-	-0.05055

Table 3 reports the results from regressing the dependent variable on growth opportunities and internally generated cash flows, without controlling for impact of economic conditions. The magnitude of Tobin's Q for small firms is larger than that for medium and large firms. In other words, future growth opportunities had a greater influence on the investment behavior of small firms than it did for medium and large firms. Even after including the change in GDP variable (CGDP) in Table 4, there was no substantial change in magnitude of the Tobin's Q for either of the size categories. We define a substantial change if there is either a change in the sign of the coefficient or a change in the ordering of the variable's importance among the three different-sized portfolios. This result was therefore robust to the inclusion of change in economic conditions.

Table 3
This Table Presents the Results from the Regression Model without Including the Change in GDP Variable

$$\frac{I_t}{K_{t-1}} = \alpha + \beta Q_t + \gamma \frac{W_t}{K_{t-1}} + \xi \frac{W_t \cdot size}{K_{t-1}}$$

Variable	Intercept	Tobin's q	WK1	Year	R2 Adj	F	N
All firms	0.1974**	0.0413**	0.0920**	-0.0117**	0.0813	28.25	925
(t-stat)	(12.88)	(6.81)	(4.22)	(-5.54)			
Small firms	0.1886**	0.0710**	0.0963*	-0.0135**	0.1034	13.80	334
(t-stat)	(6.35)	(4.93)	(2.11)	(-3.38)			
Medium firms	0.2174**	0.0317*	0.0774*	-0.0140**	0.0520	6.87	322
(t-stat)	(7.30)	(2.82)	(2.30)	(-3.24)			
Large firms	0.1392**	0.0329**	0.1818*	-0.0067**	0.2369	27.42	269
(t-stat)	(9.18)	(4.96)	(3.16)	(-3.54)			

Please see Table 1 for definitions of data items

**p<0.001; *p<0.05

Table 4
This Table includes Results from the
Regression Model including Change in GDP Variable

$$\frac{I_t}{K_{t-1}} = \alpha + \beta Q_t + \gamma \frac{W_t}{K_{t-1}} + \xi \frac{W_t \cdot size}{K_{t-1}} + CGDP$$

Variable	Intercept	Tobin's q	WK1	Year	CGDP	R2 Adj	F	N
All firms	0.11138**	0.04006*	0.09099*	-0.01132**	1.59324**	0.0877	23.20	925
(t-stat)	(3.18)	(6.61)	(4.19)	(-5.36)	(2.73)			
Small firms	0.13586**	0.06995*	0.09477**	-0.01324*	0.97800	0.1028	10.54	334
(t-stat)	(2.04)	(4.84)	(2.08)	(-3.29)	(0.89)			
Med firms	0.07687	0.03202**	0.07826**	-0.01250**	2.46739**	0.0618	6.29	322
(t-stat)	(1.04)	(2.86)	(2.33)	(-2.88)	(2.08)			
Large firms	0.08977**	0.03143*	0.18466**	-0.00689*	0.98070***	0.2364	21.74	269
(t-stat)	(3.04)	(4.73)	(3.23)	(-3.64)	(1.95)			

Please see Table 1 for definitions of data items

*p<0.001; **p<0.05; ***p<0.10

The firm's investment behavior showed a measure of sensitivity to changes in cash flows. In Table 3 the changes in cash flow sensitivity to investments were highest for the large firms and lowest for the medium firms. Changes in investments were more sensitive to changes in cash flows in small firms than in the medium firms. We found this result intriguing and one that would require further research. The results reported here are robust to the inclusion of the changes in economic conditions, as there was no substantial change after we included the economic change variable.

There were differences in the total adjusted R2 between different-sized groups of firms. The adjusted R2 was 23.7% for large firms, 5.2% for medium firms, and 10.3% for small firms. Again, there was no substantial change when the economic change variable was included.

Table 4 also shows the magnitude of the impact of the change in economic condition on the investment behavior of firms. Interestingly its magnitude was the highest for medium firms.

Overall, the data for larger firms appeared to provide the most explanatory power based on the R2 statistic. The medium firm data provided the weakest explanatory power.

DISCUSSION

Previous literature presents no conclusive evidence as to whether investments in higher financially constrained firms are more or less sensitive to free cash flows. The results here seem to suggest some of both sides of this argument. For instance, investments in smaller firms were found to have weaker sensitivity to changes in cash flows than investments in larger firms. This is a surprising result, especially given that small restaurants usually are considered to require high levels of cash flows to grow. The large firms showed the highest sensitivity between their investments and cash flows. Interpreting this and the results of Tobin's Q (see later discussion in this section) together may provide a reasonable justification. The higher growth opportunities of small firms (measured by the magnitude of Tobin's Q) may be allowing these organizations to have a higher access to external financing than for larger firms, which show relatively weaker growth opportunities. As a consequence, the large firms must fall back on internal cash flows. It is also possible that despite the availability of external capital, large firms rely on internally generated cash flows. The medium-sized group comes out to be the anomaly in the analysis, with the weakest sensitivity of investments to cash flows and the Tobin's Q. It is possible that the medium firms do not have the growth opportunities of small firms, yet want to grow to catch up with the large firms.

Controlling for economic conditions resulted in no change in the direction or strength of the relationship. One would expect investment and cash flow sensitivity in small firms to be more sensitive to economic conditions than in large firms. However, this result suggests otherwise.

The results in this paper were interesting, also, from other perspectives. The Tobin's Q was introduced in the analytical model as a measure of firms' future growth opportunities. Clearly if a firm is facing higher growth opportunities, the management would want to grow the firm, regardless of the source of capital. In other words, whether using internally generated capital or borrowed capital, the firms' owners would want to expand. Therefore, any examination of the impact of internal/external cash would have to account for the growth opportunities. The results show that the magnitude of the influence of Tobin's Q on the investment behavior was the highest for small firms and about the same for medium and large firms. This implies that growth opportunities of the smaller firms provided a stronger explanation for investment behavior than it did for the larger firms. This result was expected due to the high growth opportunities associated with smaller firms; hence the relationship was stronger. It is possible that firms that are relatively large (facing market saturation) would want to expand due to reasons other than strong growth opportunities.

IMPLICATIONS AND FUTURE RESEARCH

Overall, these results provide grounds for further investigations and initial indications for impact on industry practices. Besides anecdotal evidence of restaurant firms' cash flow requirement, to the best of our knowledge, there have been no systematic investigations of how restaurant firms manage these cash flows. A critical aspect of this cash-flow management is to use them for investments, especially if some of these firms have restricted access to external financing. The current results make an important contribution in this area of hospitality research. The findings of this research also suggest that our understanding of cash-flow analysis in restaurants is in its infancy. For instance, further investigation of differences in results between the three size categories of restaurant firms appears to be an interesting area for future research.

There could be other ways to advance this area of research. First, the size variable could be reassessed to also incorporate the role of ownership. Many restaurant firms are franchised. In these cases the firm ownership of assets is different than if the operations

are not franchised. The composition of investment variable and free cash flows also varies. Different compositions can be used to assess the impact of various factors on the investment-cash flow relationship. The type of restaurant operation (for instance, quick service versus full service or casual dining) could also impact the investment-cash flow relationship. This could further provide more specific assessment of changes in industry practice than the current aggregate analysis. Finally, this analysis is restricted to publicly traded restaurant firms. It would therefore be important to expand this research into developing an understanding of restaurant firms that represent a broader firm size, such as independent restaurants, and local and regional restaurant chains.

Still, current results suggest that larger firms need to better manage their cash flows to ensure uninterrupted financing for their investments. Cash-flow management techniques are growing in sophistication. However, there is no evidence that restaurant firms apply these techniques with any level of effectiveness nor that such techniques reduce the sensitivity of investments to cash flows. This issue, with various other perspectives, such as the actual adoption and implementation of cash-flow management systems, also presents itself as a potential area of future research.

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Arun Upneja is Associate Professor, School of Hotel, Restaurant and Recreation Management, The Pennsylvania State University; **Amit Sharma** is Assistant Professor, School of Hotel, Restaurant and Recreation Management, The Pennsylvania State University.