AN EMPIRICAL ANALYSIS OF THE EFFECT OF DIVERSIFICATION ON FINANCIAL PERFORMANCE: THE CASE OF THE US GROCERY STORE INDUSTRY

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ABSTRACT: *This paper examines the impact of diversification on the financial performance of publicly traded grocery stores. Using three different approaches, we find that diversification has a positive and significant effect on the financial performance of grocery stores. In addition, multivariate regression analysis shows that while diversification positively impacts financial performance, other factors such as size, market share, and leverage cannot be ignored in explaining financial performance of grocery stores. The results of this paper suggest that diversification into non-food products is a profitable business strategy for grocers.*

JEL Classification: L25; L81; C82

Keywords: diversification, financial performance, grocery store industry

1. INTRODUCTION

The extant literature that analyzed the relation between diversification and firm performance in the retail industry found conflicting results. The focus of this paper is toempirically investigate the effect of diversification on the financial performance of the US publicly traded grocery stores.

Financial performance influences investment decisions and is therefore significant in the determination of firm value and resource allocation in capital markets. An examination of financial performance in the grocery industry will help to direct industry's future investment pattern. The grocery industry is a growing segment of theUS retail industry with total sales exceeding $510 billion in 2007 (Morgan, 2009). Publicly traded firms account for more than 50% of the total grocery sales (Morgan, 2009). This industry consists of both diversified and undiversified stores.[1]

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Theories abound, which link diversification with performance. Some believe that diversification is a strategy used by managers of firms to improve their firm's performance. In that case, they assume that diversification will have positive impact on the performance of their firms. Some studies have found that on average, diversified firms show better performance compared to undiversified firms on both risk and return dimensions (Pandya and Rao, 1998). They conclude that a dominant undiversified firm may perform better than a highly diversified firm. In the same vein,diversification can enhance efficiency and performance through economies of scope (Panzar and Willig, 1981)or by market power through cross subsidization or through multimarket contacts (Edwards, 1955).

In 1986, it was found that by 1974, only 14 percent of the Fortune 500 firms operated as single businesses and 86 percent operated as diversified businesses (Rumelt, 1982). In their paper, Lang and Stulz (1994) suggest that their evidence is supportive of the view that diversification is not a successful path to higher performance but it is less definitive on the question of the extent to which diversification hurts performance. They claim that the reason for the diversification in the firms they examined was because they had exhausted growth opportunities in their existing activities. There is the suggestion that firms, which diversify into similar activities and can use some of their existing skills, might have a comparative advantage in these activities, but firms that diversify into unrelated activities might not have such advantage and hence might perform poorly.

The very idea of diversification seems to be born out of an old adage, which says that "you do not put all your eggs in one basket." The implication is that if you do and there is a minor accident where the basket falls, all the eggs would break. We do know that all products are not eggs and we cannot put eggs together with other products that are not closely related. They might break the eggs. This can explain what some findings see as positive impact of diversification on performance within related activities than when activities are unrelated.

Reversing the question was an area pursued by Burgers, *et al.* (2009). They argue that it could be possible that performance actually has an impact on the firm's diversification strategy instead of the reverse where diversification impacts performance. One can pose the question; since we are not performing as well as we should, can we diversify the operation to see if we can capture greater value and what form of diversification could be adopted under the circumstances?

Lang and Stulz (1994) examined the association between Tobin's *q* and firm diversification. They concluded that the two are negatively related throughout the 1980s. They noted that firms that choose to diversify are poor performers relative to firms that do not. In other words, firms diversify seeking to achieve better performance. But there was no evidence in their study "to support that diversification provides firms with a valuable intangible asset." Along the same line, some authors argue that diversification can reduce performance because of diseconomies of scope (Dixon, 1994) or through management's empire building (Marris 1964).

Two previous studies use ratio analysis to examine the effect of diversification on the performance ofretailing industry. Kerin and Varaiya (1985) find that diversification has a marginal effect on performance. Keep *et al.* (1996), on the other hand, find that diversification has inconsistent effects on performance. We extend this literature in two different ways. First,

we focus on a specific industry: grocery industry. We are assuming that grocery stores are different than other stores in terms of the frequency of visits to purchase food and that diversification into non-food products would save the consumer trips to other stores and, thus, consistently improve financial performance of grocery stores. Second, unlike previous studies and for robustness check, we use three different empirical methods to analyze the effect of diversification on the financial performance of the US publicly traded grocery stores. These methods include: financial statement analysis, Data Envelopment Analysis, and multivariate regression analysis.

In the first approach, we use financial statement analysis, which compares accounting and financial ratios of diversified grocers with those of undiversified grocers. In this paper, a grocery store is classified as diversified if its sales consist of food and non-foodproducts (e.g., Walmart and Kroger's).A grocery store is classified as non-diversified if its sales consist solely of food related products (e.g.,Supervalu and Winn-Dixie). The latter grocery stores are used as a benchmark for analyzing the likely effect of diversification into non-food markets on the financial performance of grocery stores. In the second approach, we use multivariate regression analysis that examines the effect of diversification on the financial performanceofgrocery stores while controlling for other factors that affect performance. In the third approach, we use a non-parametric method: Data Envelopment Analysis, which compares financial performances of diversified grocers with those of non-diversified grocers. We also conduct a series of sensitivity analyses.

The remainder of the paper is structured as follows. The next section examines the effect of diversification onfinancial performance using financial statement analysis, multivariate regression analysis and Data Envelopment Analysis. The third section conducts a series of robustness checks. The fourth andlast section concludes the paper.

2. THE EFFECT OF DIVERSIFICATION ON FINANCIAL PERFORMANCE

To examine the effect of diversification on financial performance of publicly traded grocery stores, we use three different methods including, financial statement analysis, multivariate regression analysis, and Data Envelopment analysis.

2.1. Financial Statement Analysis

To conduct the financial statement analysis, we use three different accounting ratios. These ratios include: Return on Asset (ROA), Return on Equity (ROE), and Return on Investment (ROI). Return on Asset is the ratio offiscal years' total income tototal assets before extraordinary items. Return on Equity is the ratio offiscal year after taxincome before common stock dividendstototal common equity. Return on Investment is the ratio of income before extraordinary items tototal invested capital.

In addition to accounting measures of performance and for robustness check, we use Tobin's *q* as an additional measure of performance. Tobin's *q* has been used in several research papers as a measure of performance (e.g., Mura, 2007; Bharadwaj *et al.*, 1999; Yermak, 1996; Lang and Stulz, 1994; Montgomeryand Wernerfelt, 1988). To compute Tobin's *q*, we follow the computational technique advocated by Chung and Pruitt (1994).[2]We choose this technique

because it is simple to compute, uses accounting and financial data readily available in the Compustat Databaseand yields results qualitatively similar to those obtained by the traditional approach developed by Lindenberg and Ross (1981). Following Chung and Pruitt (1994) Tobin's *q* is given as

$$q = \frac{MVE + PS + DEBT}{TA},$$

where MVE is a firm's share price times the number of common stock shares outstanding, PS is the liquidating value of the firm's outstanding preferred stock, DEBT is the value of the firm's short-term liabilities net of its short-term assets plus the book value of the firm's long term debt, and TA is the book value of total asset.

In order to compute accounting ratios and Tobin's *q* for diversified and non-diversified grocers, we use yearly data from 2000 to 2006. The results of financial statement analysis and statistical test for equality of means are displayed in Table 1 and Table 2, respectively. Based on Return on Asset (ROA), Return on Investment (ROI) and Tobin's *q*, the results indicate that for the entire study period (i.e., 2000-2006) diversified grocery stores exhibited higher financial performance than non-diversified grocery stores, and the relationship is statistically significant at least at the 5% level for ROA and Tobin's *q*, and 11% level for ROI. Based on Return on Equity, however, the results are mixed and the relationship is not statistically significant. While diversified grocers performed better than non-diversified grocers in 2000, 2001 and 2005; non-diversified grocers performed better than their diversified counterparts in the other years. This latter result can be attributed to grocery store's capital structure. Thus, a grocery store's financing decisions (i.e., its capital structure) can change because of economic conditions (e.g., change in inflation rates, or change in interest rates) without a corresponding change in the grocery store diversification portfolio. As a result, a shock in a grocery store capital structure does not necessarily translate into a shock in the grocery store diversification. This likely explains the weak correlation between Return on Equity and diversification in those years.

Table 1
Results of Financial Statement Analysis

				Ratio				
	Non-diversified grocers				*Diversified grocers*			
Year	*ROA*	*ROE*	*ROI*	*Tobin's q*	*ROA*	*ROE*	*ROI*	*Tobin's q*
2000	0.04	0.09	0.05	1.98	0.03	0.08	0.05	1.57
2001	0.04	0.21	0.06	1.46	0.06	-1.33	0.09	2.48
2002	0.05	0.18	0.07	1.34	0.06	0.74	0.08	2.21
2003	0.05	0.09	0.07	1.44	0.05	0.09	0.06	2.51
2004	0.05	-0.04	0.08	1.55	0.05	-0.01	0.07	3.15
2005	0.03	-0.92	-0.06	1.46	0.10	0.24	0.17	3.28
2006	0.05	-0.03	0.06	1.59	0.08	0.16	0.14	4.13

Note: ROA, ROE and ROI stand for Return on Asset, Return on Equity and Return on Investment, respectively.

Table 2
Statistical Test for Equality of Means

		Ratio			
		ROA	*ROE*	*ROI*	*Tobin's q*
Non-diversified grocers	N[1]	108	108	108	108
	Mean	0.04	-0.07	0.05	1.55
	S.E[2]	0.005	0.125	0.022	0.085
Diversified grocers	N[1]	46	46	46	46
	Mean	0.06	-0.05	0.09	2.71
	S.E[2]	0.057	0.273	0.015	0.302
T-Test for Equality of Means	Mean difference	-0.02	-0.02	-0.029	-1.16
	S.E[2]	0.009**	0.261	0.009	0.236*
	T-Statistics	-1.68	-0.08	-1.24	-4.91

[1]Number of observations; [2]Standard Errors
Significance level: *1% and **5%.
Note: ROA, ROE and ROI stand for Return on Asset, Return on Equity and Return on Investment, respectively.

Overall, on the average, diversified grocery stores outperformed their non-diversified counterparts irrespective of the financial performance measure used. This result is in accord with that found by Keep *et al.*, (1996).[3]

2.2. Multivariate Regression Analysis

The paper further analyzes the effect of diversification on the financial performance of grocery stores using multivariate regression analysis. This analysis examines the effect of diversification on the grocery store financial performance while controlling for other factors likely to influence performance, such as advertising intensity, market share, and leverage. The choice of a simple multivariate regression model instead of a dynamic model was based on prior literature (see for example, Montgomery and Wernerfelt, 1988; Lang and Stulz, 1994). Unlikeunivariate regression analysis, multivariate regression analysis allows us to test whether the empirical results of the effect of diversification on financial performance are not driven by other factors.

2.2.1. Measures of Performance

To gauge firm's performance, and for robustness check, we use four different accountingmeasures of performance. The accounting measures included are: Return on Asset (ROA), Return on Equity (ROE), Return on Investment (ROI), and Tobin's*q*.

2.2.2. Measures of Diversification

To examine whether diversification affects financial performance of grocery stores,we use a measure of diversification proposed by Scherer and Ravenscraft (1984).[4] This measure is defined as the number of different major four-digit SIC codes reported by a grocery store. The magnitude of this measure of diversification hinges on the number of four-digit codes reported by a grocery store. This diversification index takes on, for instance, the value of 1 if a grocery store reports only one four-digit SIC code, and takes on the value of 2 if a grocery store reports 2 different four-digit SIC codes. Hence, the diversification index becomes larger as a grocery store becomes

more diversified. The index measure of diversification is the main variable in the multivariate regression models.

2.2.3. Control Variables

Besides the variable of interest, i.e., diversification index, we also control for other variables likely to affect the financial performance of grocery stores. The choice of the control variables is based on prior empirical literature and on data availability. These control variables include: the size of grocery store, advertising intensity, market share, capital intensity, and leverage. The size can reflect market power and barrier to entry (Sudarsanam, 1992). Size can also capture cost efficiencies because larger grocery stores can benefit from scale and/or scope economies.[5]We use market value of equity as aproxy for the size of grocery store (see, e.g., Klassen, 1997). Advertising intensity is the ratio ofgrocery store's advertising expenses to total sales (e.g., Bass *et al.*, 1978; Bharadwaj *et al.*, 1999). Advertising can be used as a barrier to entry. Prior literature suggests a positive relationship between advertising and performance (Nelson, 1974; Schmalensee, 1978). Market share is the ratio of grocery store's sales to industry total sales.[6] Capital intensity is the ratio ofgross plant property and equipment to total assets. Capital intensity can positively affect performance (Capon *et al.*, 1990) and could alsoimpede performance (Waring, 1996). The impact of capital intensity on performance is therefore an empirical question. Leverage is the ratio of total liabilities to total assets. There are mixed results regarding the impact of leverage on performance. While one strand of literature reports a positive relationship between leverage and performance (Modigliani and Miller, 1963; Ross, 1977), another strandestablishes a negative relationship between leverage and performance (Myers, 1977). Formally, to assess the effect of diversification on the financial performance of grocery stores while controlling for other factors likely to influence financial performance,we estimate the following multivariate regression model

$$\pi_{it} = a_0 + a_1 DI_{it} + a_2 S_{it} + a_3 AD_{it} + a_4 MS_{it} + a_5 KI_{it} + a_6 LV_{it} + u_t,$$

where, π_{it} is a measure of grocery store i's performance in year t, which includes Return on Asset (ROA), Return on Equity (ROE), Return on Investment (ROI), and Tobin'sq; DI_{it} is the diversification index; S_{it} is the size of grocery store i in year t; AD_{it} is advertising intensity of grocery store i in year t; MS_{it} is market share of grocery store i in year t; KI_{it} iscapital intensity of grocery store i in year t; LV_{it} is leverageof grocery store i in year t;a's are parameters to be estimated; and u_t is an error term which is assumed to be identically and independently distributed.

2.2.4. Data and Descriptive Statistics

In order to compute accounting ratios and Tobin's q, and to estimate the multivariate regression models we use yearly data from 2000 to 2006.[7] Descriptive statistics for the main variables is reported in Table 3.

2.2.5. Empirical Results

The multivariate regression model is estimated using the cross-sectional time-series generalized least squares method (XTGLS). Unlike the classical econometric methods (fixed effects and random effects specifications), XTGLS has the advantage of correcting for autocorrelation within

Table 3
Descriptive Statistics for the Variables

Variable	Mean	CV[1]	Median	Max	Min
Return on Asset (ROA)	0.05	1.10	0.05	0.19	-0.35
Return on Equity (ROE)	-0.06	-23.76	0.12	4.84	-11.66
Return on Investment (ROI)	0.06	3.32	0.08	0.33	-2.19
Tobin's q	1.90	0.76	1.39	8.19	0.07
Advertising intensity (AD)	0.02	0.81	.019	0.07	0.00
Size (S)	14822.50	3.12	1086.33	256270.15	0.04
Capital intensity (KI)	0.87	0.28	0.87	1.45	0.32
Leverage (LV)	0.31	0.87	0.32	0.87	-0.22
Diversification index (DI)	1.40	0.47	1.00	3.00	1.00
Market share (MS)	4.55	2.34	0.71	53.55	0.07

[1]Coefficient of variation.

panels and cross-sectional correlation and/or heteroskedasticity across panels.[8] The multivariate regression model is estimated using Return on Equity (model l), Return on Asset (model 2), Return on Investment (model 3) and Tobin's q (model 4) as the dependent variables, respectively. Empirical results of the estimation are provided in Table 4.[9]

The multivariate regression models are significant at the 1% level under a Wald test. Throughout the multivariate regression models, the size of grocery store has a small, positive and highly significant coefficient. This positive effect of size on performance likely reflects market power or cost efficiencies arising from economies of scale and/or economies of scope. Apart from model 4 where Tobin's q is used as a measure of performance, market share is positive and significant throughout the multivariate regression models. Advertising has conflicting effects on performance. The coefficient on capital intensity is negative, but significant only in model 3 and model 4 where ROI and Tobin's q are used, respectively, as measures of

Table 4
Results of Multivariate Regression Analysis

Independent variable	Dependent Variable							
	ROE		ROA		ROI		Tobin's q	
	Estimate	S.E[1]	Estimate	S.E[1]	Estimate	S.E[1]	Estimate	S.E[1]
Intercept	0.12	0.01*	0.07E-1	0.04E-1***	0.04	0.07E-1*	1.19	0.09*
Diversification	0.01	0.04E-1**	0.07E-1	0.02E-1*	0.01	0.03E-1*	0.06E-1	0.20
Size	6.70E-7	3.5E-08*	2.00E-7	9.49E-9*	2.99E-7	2.08E-8*	6.29E-6	1.01E-6*
Advertising	0.14	0.13	-0.15	0.07**	-0.37	0.10*	0.48	0.60
Market share	0.16	0.02*	0.11	0.08E-1*	0.19	0.01*	-3.07	0.45*
Capital intensity	-0.05E-1	0.07E-1	0.06E-1	0.05E-1	-0.04	0.09*	-0.31	0.11*
Leverage	-0.04	0.01*	0.07	0.04E-1*	0.13	0.08E-1*	1.76	0.10*
Adjusted-R^2	107.94		396.19		306.46		-65.64	
Wald-χ^2(6)	740.07*		1361.33*		1058.20*		737.13*	
N^2	154		154		154		154	

[1]Standard Errors; [2]Number of observations.
Significance level: [*]1%, [**]5%, and [***]10%.
Note: ROA, ROE and ROI stand for Return on Asset, Return on Equity and Return on Investment, respectively. The value of the adjusted-R^2 is the log-likelihood value.

performance. The coefficient on leverage is statistically significant but with inconsistent signs depending on the performance measure used, indicating that leverage should be considered carefully in the financial decisions of grocery stores.

Of particular importance is the diversification index. Its coefficient is positive throughout the multivariate regression models and statistically significant, except in model 4, at least at the 5% level, suggesting that diversification has a positive and significant effect on the financial performance of grocery stores. The results of multivariate regression analysis show that while diversification has a significant impact on the financial performance of grocery stores, other factors such as market share, size of grocery store, and leverage cannot be ignored in explaining the financial performance of grocery stores.

There are two potential channels through which diversification can impact financial performance. The first channel is through economies and efficiencies due to grocery stores' diversification. The second channel is that poor financial performance of non-diversified grocery stores, as compared to their diversified counterparts, can be attributed to fierce competition in the food retailing industry. In that respect, the Food Marketing Institute in its Annual Financial Review (2007) reported that the profit margins in the food retailing industry are low (i.e., less than 2%) largely because of stiff competition among food retailers. It is likely, therefore, that diversification allows grocery stores to benefit from higher profit margins in non-food related industries. This, in turn, enhances the financial performances of diversified grocery stores.

2.3. Data Envelopment Analysis

To further assess the impact of diversification on the financial performance of grocery stores, we use a non-parametric method: Data Envelopment Analysis (DEA). To do that, we compare DEA ratings of diversified grocery stores with those of undiversified grocery stores. DEA is a managerial tool that can provide insight into the firm's financial performance (Banker *et al.*, 1989; Bowling, 1999). DEA ratings range from 0 to 1. While a DEA rating closer to one is an indicator of a firm's higher financial performance, a DEA rating closer to zero is an indicator of a firm's poor financial performance. DEA is simple to implement and does not impose any functional form on the data. DEA has been commonly used to evaluate financial performance of firms in various industries. These industries include the banking industry (Ferrier and Lovel, 1990), the pharmaceutical industry (Smith, 1990), the transportation industry (Thirty and Tulkens, 1992), the defense industry (Bowling, 1999), and the brewing industry (Day *et al.*, 1995).

2.3.1. DEA Model

Mathematical formulation of DEA under the assumption of constant returns to scale technology is given by

$$\underset{\gamma\ z}{\text{Min}}\ \gamma^c$$

Subject to:

$$\sum_{k=1}^{n} z_k y_k \geq y_c, \ k = 1,...,n;$$

$$\sum_{k=1}^{n} z_k x_{ik} \leq \gamma^c x_{ic} \ , \ \ i = 1, \ldots, m;$$

$$\sum_{k=1}^{n} z_k = 1, \ \text{and}$$

$$z_k \geq 0 \ .$$

Where γ^c is DEA rating for the cth grocery store; y_k is the outputproduced by the$k$thgrocery store; x_{ik} is thequantity of the $i$thinput used by the k thgrocery store; n is the number of grocery stores; m is the number of inputs; and z_k are input-output weights for the$k$th grocery store.

2.3.2. Data Description

The selection of input and output variables for use in DEA model is based on prior empirical research, and also on the availability of data (see, for instance, Athanassopoulos and Ballantince, 1995; Sellers-Rubio and Mas-Ruiz, 2009). We use one output and two inputs. Sales are used as output. The first input is the number of employers which proxies for labor. The second input is property, plant and equipment which proxy for capital. This paper uses panel data for 7 years (2000-2006). Again, the data set used to estimate DEA ratings is taken from Compustat Database.

2.3.3. Empirical Results

The estimates of DEA ratings are reported in Table 6. The mean DEA ratings are 57.2% and 44.9% for diversified and non-diversified grocery stores, respectively. Over the study period, that is; from 2000 to 2006, diversified grocery stores have higher DEA ratings than non-diversified grocery stores. Hence, diversified grocers exhibited higher financial performance as compared to their non-diversified counterparts. The results of DEA, once again, indicate that diversification has a positive effect on the financial performance of grocery stores.These results can likely be attributed, in part, to cost saving through economies of scope. This lends support to the hypothesis that diversification into non-food products is a profitable business strategy.

Table 6
Results of Data Envelopment Analysis under CRST[1]

	DEA Rating(%)	
Year	*Diversified grocers*	*Non-diversified grocers*
2000	54.3	45.9
2001	57.3	45.1
2002	57.4	45.1
2003	58.7	46.3
2004	59.1	44.5
2005	59.1	46.2
2006	54.5	41.3
Mean	57.2	44.9

[1]CRST denotes constant Returns to Scale Technology.

3. ROBUSTNESS CHECKS

In this section, we conduct a series of sensitivity analyses. The first sensitivity analysis pertains to multivariate regression analysis. The second sensitivity analysis pertains to DEA model. The last sensitivity analysis examines the effect of outliers.

3.1. Multivariate Regression Analysis

To further investigate the ability of diversification in explaining performance, were-estimate the multiple regression models without diversification index. Table 7 reports the results of adjusted-R^2 both when the diversification index is included and when it is excluded in the regression models. The results indicate that there is a slight improvement in the explanatory power of the model as captured bythe adjusted-R^2 when diversification is included in the multivariate linear regression models. This shows that diversification index variable provides information in explaining variation in the financial performance of grocery stores. This, again, lends support to the hypothesis that diversification into non-food products positively affectsthe financial performance of grocery stores.

Table 7
Relation between Diversification and Performance

	Adjusted-R^2	
Model	*With diversification index*	*Without diversification index*
Model 1	107.9	106.0
Model 2	396.2	392.2
Model 3	306.5	303.4
Model 4	-65.6	-65.7

Note: in model 1ROE is used as the dependent variable.
In model 2 ROA is used as the dependent variable.
In model 3 ROI is used as the dependent variable.
In model 4 Tobin's *q* is used as the dependent variable.
The value of the adjusted-R^2 is the log-likelihood value.

3.2. Data Envelopment Analysis

As a sensitivity check and to take into account any imperfections in the industry, were-estimate the DEA model under the assumption of variable returns to scale technology (Banker et al., 1984).A glance at the results displayed in Table 8 reveals that the mean DEA ratings are 75.4% and 69.4% for diversified and non-diversified grocery stores, respectively. Apart from 2006 and 2004, diversified grocery stores outperformed their non-diversified counterparts. Overall, diversified grocery stores exhibithigher financial performance as compared to non diversified grocery stores.

3.3. Outliers

To check the robustness of the results to outliers, weremoved observations with large absolute residuals, and then re-estimate the regression models. This procedure did not alter the quality of the results, indicating that the results are not driven by outliers.

Table 8
Results of Data Envelopment Analysis under VRST[1]

Year	DEA Rating(%)	
	Diversified grocers	*Non-diversified grocers*
2000	81.0	64.7
2001	80.6	67.6
2002	80.7	71.2
2003	81.3	69.0
2004	67.6	70.7
2005	68.7	68.3
2006	68.2	74.8
Mean	75.4	69.4

[1]VRST denotes Variable Returns to Scale Technology

4. CONCLUSION

The grocery industry is a growing segment of the US retail industry. This industry consists of diversified and non-diversified grocery stores. This paper examinesthe effect of diversification into non-food products on the financial performance of publicly traded grocery stores. To do that, the paper uses three different methods. The first method uses financial statement analysis, the second method is based on multivariate regression analysis, and the last method uses Data Envelopment Analysis.

Financial statement analysis reveals that diversified grocery stores exhibithigher financial performance as compared to their non-diversified counterparts irrespective of the performance measure used. The results of multivariate regression analysis show that while diversification has a positive and significant impact on the financial performance of grocery stores, other factors such as market share, size of grocery store, advertising intensity, and leverage cannot be ignored in explaining the financial performance of grocery stores.Finally,DEA analysis indicates that diversified grocery stores exhibithigher financial performance as compared to non diversified grocery stores. These results are robust to various methodological and empirical specifications.

Overall, diversification has a positive and significant effect on the financial performance of grocery stores. The results of this study suggest that diversification into non-food products is a profitable business strategy for grocers.

NOTES

1. According to US Census Bureau, grocery store industry consists of "establishments primarily engaged in retailing a general line of food products".

2. The difficulty associated with the traditional approach was computational. To circumvent this problem, Chung and Pruitt (1994) worked out an approximation of Tobin's q, and reported that this approximation of Tobin's q explained at least 96.6% of the variability of the Tobin's q obtained using Lindenberg and Ross' approach (1981).

3. Using operating profit-to-sales ratio as a measure of performance, Keep et al., (1996) found that food retailers were among the diversified retailers that exhibited higher financial performance.

4. We did not use other measures of diversification other than the measure of diversification proposed by Scherer and Ravenscraft (1984) because this measure of diversification is simple to compute and yields

qualitative results similar to those obtained by other measures of diversification such as: the Herfindhal index measures of diversification, and the number of segments (please refer to the paper by Lang and Slutz, 1994).

5. A firm experiences scale economies if its average cost decreases as its level of output increases. Scope economies exist when it is less costly to produce a set of different products jointly than to produce them separately.

6. Industry concentrationis not included in the multivariate regression model because it is highly correlated with market share thereby avoiding the problem of multicollinearity. In addition, the inclusion of both the industry concentration and market share in the multivariate regression model can make the effect of concentration superfluous (Shepherd, 1986).

7. Including more data periods or extending the period of observation does not make any difference in the result. Any such effort would just be an exercise in futility. More importantly, the main objective of the paper is to empirically test whether diversification into non-food markets is a profitable business strategy for grocers.

8. For more details about this econometric technique see Stata Corporation (2001, pp. 347-355 and 434-455).

9. The multivariate regression models are estimated using the software package Stata.

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