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Profitability Analysis of Fast-Food Stores in Nueva Ecija, Philippines using Multiple Linear Regression

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***Abstract*–This paper analyzed the various factors influencing the profitability of fast-food stores in Nueva Ecija, Philippines. Using multiple regression, the relationship between the dependent (profitability) and independent variables (monthly working capital, years of operation, size, availability of delivery services, number of workers, number of promotion activities per month, and corporate social responsibility [CSR] activities) was determined. Working capital, years of operation, number of employees, and CSR activities were found to have a significant impact on a fast-food restaurant's profitability. The adjusted r^2 is 99 percent, indicating that these variables can explain 99 percent of the variation in profits. Size and promotion activities are other variables that have a positive relationship with profitability but do not have significant coefficients. The variable availability of delivery services negatively affects profitability, and the coefficient associated with this variable is insignificant. Therefore, it is recommended that fast-food restaurants maintain or enhance these factors affecting profitability to generate greater profits for their business operations.**

***Index Terms*– business operations, fast-food stores, multiple linear regression, profitability**

INTRODUCTION

Food is always regarded as a household necessity. In the Philippines, as in other countries with a lower GDP per capita, food accounts for a significant portion of total household expenditures[1].

The increasingly fast pace of life has prompted people to seek fast food to fit into their short lunch hours. These fast-food restaurants, also known as quick-service restaurants, attract urban consumers because they provide convenience, good food, prompt service, clean facilities, and relatively inexpensive prices. They are also easily accessible due to their strategic placement in shopping malls, commercial districts, and busy intersections. Eating out satisfies consumers'needs for convenience, pleasure, entertainment, time-saving, and social interaction.

The fast-food industry has maintained growth over the past decade due to the strong performance of various fast-food restaurants. Like any other business, a fast-food restaurant's profitability depends on various factors. Managing a fast-food restaurant requires carefully balancing factors that enable the business to fulfill orders quickly and profitably. The amount of working capital, number of employees, availability of various services for the convenience of customers, implementation of marketing strategies, and conduct of corporate social services are some factors that affect this balance. Consequently, this study examined the factors influencing the profitability of the fast-food industry.

METHODS

The samplein this research are 15 fast-food restaurants in Nueva Ecija, Philippines. Face-to-face interviews were conducted, and data on their operations were gathered. Structured questionnaires were provided to the store managers or owners. Data were analyzed using multiple linear regression to evaluate the dependent variable (profitability) in relation to seven independent variables (monthly working capital, years of operation, size, availability of delivery services, number of workers, number of promotion activities per month, and corporate social responsibility [CSR] activities). The multiple regression also determines how much of the variance in the dependent variable is explained by the independent variables that aid in ensuring a better explanation of profitability.

The linear regression model used in the analysis is given below:

$$\begin{aligned} Profit = {} & \beta_0 + \beta_1\, monthly\ working\ capital + \beta_2\, years\ in\ operation \\ & + \beta_3\, size + \beta_4\, availability\ of\ delivery\ services \\ & + \beta_5\, number\ of\ workers \\ & + \beta_6\, number\ of\ promotion\ activities\ per\ month \\ & + \beta_7\, CSR\ activities + \epsilon \end{aligned}$$

β0 is the value of profit when the independent variable is 0, while β1–β7 refer to the coefficient values that measure the changes in profit with respect to a one-unit change in the independent variable.

Results And Discussion

Table Isummarizes the descriptive statistics of the sample fast-food stores. Included are the minimum, maximum, means, and standard deviations of the dependent variable profit and the seven independent variables (i.e., monthly working capital, years of operation, size, availability of delivery services, number of workers, number of promotion activities per month, and CSR activities).

TABLE I
SUMMARY OF DESCRIPTIVE STATISTICS OF THE SAMPLE FAST-FOOD RESTAURANTS

Variables	Maximum	Minimum	Mean	S.D.
Profit	2,300,000	622,122	683,493	2,300,000
Working capital	1,200,000	10,000	275,420	305,981
Years of operation	18	7	5	18
Size	8	4	2	8
Delivery services	2	1	1	2
No of workers	30	6	8	30
Promotion activities	2	--	1	2
CSR activities	1	--	--	1

The highest monthly profit was PHP 2,300,000, while the lowest was PHP 622,122. The average monthly profit was PHP 683,493. The highest monthly working capital is PHP 1.2 million, and the lowest is PHP 10,000, with a monthly average of PHP 275,420. The longest-operatingstores among the respondents were in service for 18 years. In terms of delivery services, all of them provide delivery services, while others also coordinatewith food delivery services. In terms of the number of workers, the large stores have 30 workers, whereas the others have six, including the owners. There are some whoengage in promotional activities at most twice monthly. Some stores have CSR activities, while others do not. The multiple linear regression equation is given as follows:

$$\begin{aligned} Profit = {} & (53{,}660.52) + 0.23 \text{ monthly working capital} \\ & + 12{,}099.22 \text{ years in operation} + 9{,}083.73 \text{ size} \\ & + (47{,}279.53) \text{ delivery services} \\ & + 12{,}141.70 \text{ number of employees} \\ & + 11{,}157.95 \text{ number of promotion activities per month} \\ & + 206{,}689.37 \text{ CSR activities} + \epsilon \end{aligned}$$

Independent variables, such as working capital, years of operation, number of employees, and number of CSR activities,significantly and positively impacted the profitability of fast-food restaurants. While size and promotion activitieshave a positive relationship with profitability, the relationship is not significant. Delivery services have a negative impact on a firm's profitability, but the relationship is not significant (Table II).

TABLE II
MULTIPLE LINEAR REGRESSION RESULTS

Variables	Coefficients	*p*-value	Significance
Profit	(53,660.52)	0.412565	
Working capital	0.23	0.000002	Significant
Years of existence	12,099.22	0.044308	Significant
Size	9,083.73	0.401954	Not significant
Delivery services	(47,279.53)	0.447828	Not significant
No of workers	12,141.70	0.010749	Significant
Promotion activities	11,157.95	0.696817	Not significant
CSR Activities	206,689.37	0.001724	Significant

Relationship Between Working Capital and Profit

The regression analysis shows that monthly working capital affects the monthly profit. The beta coefficient of 0.23 means that a 1 unit increase in monthly working capital results in a 0.23 increase in profit. This is consistent with previous studies [2], [3] that concluded that working capital has positive effects on a firm's profitability;other studies found otherwise [4].

Relationship Between Years of Operation and Profit

The number of years a fast-food restaurant has been in business positively affects profitability. For each year of operation, an additional PHP 12,000 is added to the restaurant's monthly profit. According to interviews, food safety compliance is one crucial factor that fast-food restaurants maintain through the years. Food sanitation is necessary to avoid food-related problems [5],important in food safety compliance.However, previous research has found that firm age does not affect corporate performance [6], [7].

Relationship Between Size and Profit

Based on the regression model results, the firm's size does not affect its profitability. This is consistent with the claims of previous research [8], [9].

Relationship Between Delivery Services and Profit

The *p*-value for delivery services indicates that this variable does not impact profitability. This finding contradictsprevious studies, which found positive effects of delivery services on customer satisfaction[10], [11]. Some customers prefer delivery services over physical purchases because of the time savings and convenience they provide.

Relationship Between Number of Workers and Profit

The store's workforce has a significant impact on profitability. Its value indicates that an additional employee would generate an additional PHP 12,000 monthlyprofit for fast-food restaurants. This could be attributed to the need for additional manpower to perform related tasks such as meal preparation and customer service. Previous studies support [12]these findings, while others found the opposite [13].

Relationship Between Promotional Activities and Profit

The results showed that promotional activities do not affect the fast-food restaurant's profit. This could be because promotion activities negatively affect profit due to increased spending on advertisements[14]. However, other studies assert that advertising directly impacts a company's profitability[15].

Relationship Between CSR Activities and Profit

CSR refers to activities that go above and beyond what the law requires by incorporating social, ethical,environmental, and consumer concerns into business operations to give value to its shareholders and stakeholders[16]. According to this study's findings, implementing CSR positively impacts the fast-food restaurant'sprofit. Companies that allot a budget for more CSR see an increase in revenue and profitability[17] and [18].

Table III shows the summary of the linear regression model. The R^2 and adjusted R^2 square are both +0.99, indicating that the significant independent variables can explain 99% of the variation in profitability of the 15 surveyed fast-food restaurants.

TABLE III
SUMMARY OF REGRESSION STATISTICS OF THE LINEAR REGRESSION MODEL

Variables	Value
Multiple *R*	0.99898
R^2	0.99796
Adjusted R^2	0.99591
Standard Error	43685.21753

Conclusion And Recommendations

Multiple linear regression was used to examine the effects of seven independent variables on the profitability of fast-food restaurants. Based on results, the number of workers, which translates to faster service time, can contribute to customer satisfaction. On the other hand, the number of years and the participation in CSR activities contribute to a good reputation. Hence, it can be concluded that customer satisfaction and a good reputation affected profits. This has also been demonstrated by [19], [20], and [21] studies.It is suggested that the company monitor these variables to keep the operation sustainable. The results can be used to further improvefast-food restaurants' performance to generate adequate sales for continuous operation. Since employees are one of the profit contributors, it is also necessary to adequately compensate and provide good working conditions. Continuous implementation of CSR benefits both the community and the company. The promotionalactivities may also be examined to see how they can significantly affect the company's profit.

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