
A SURVEY ON THE EFFECTS OF R&D, ADVERTISING SPENDINGS ON BUSINESSES REVENUE AND THE COMPETITIVE PARITY METHOD

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Abstract: *One of the main problems faced by business managers from the past to the present is how to use their resources in the most profitable way. It is the planning of what, where, how much, when, how, for whom it will be produced or presented, and their financing. The aim of this study is to examine the effects of advertising spendings on operating profit, which is the most important element of the promotion mix in the marketing function with R&D spendings using regression analysis, additionally to explain how the competitive parity method has an impact on budget planning by performing cluster analysis by sectors.*

Keywords: *marketing communications, business spending, competitive parity method, clustering analysis, regression analysis*

Introduction

The main goals of businesses are to provide profit and to continue their growth. For reaching these goals, businesses have to operate production, management, marketing, accounting, finance, public relations, human resources, research and development etc. departments by considering their compatibility with each other. The correct management of the expenses incurred as a result of these functions has become a more important issue for businesses, considering the competitive market conditions. Although each department is seen as an inseparable part of the whole in terms of business management, some departments may be relatively less or more in the foreground due to business profitability and the dynamics of the sector they are in.

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Factors that affect business profit positively and negatively are one of the main topics of business and finance literature. Research in recent years has mostly focused on the effects of firm spending on intangible assets and how these spending will be included in the tables in the company's finances. After the 1980s, while the importance of marketing increased compared to the management function, the budget balances allocated for these functions began to be discussed frequently. Especially, while today's competitive conditions are getting harder, the management of expenses incurred as a result of business functions has become a much more important issue.

In this study, the effects of advertising spending, which have an important place in marketing spending, and R&D spending on business revenues were examined. The data set used in the study was compiled from data which top 2500 companies that made the largest R&D investments in the World in 2019 on the <https://ec.europa.eu/> website and top 100 companies that spend the most on advertising in the World in 2019 on the <https://www.visualcapitalist.com/> website. 53 companies in both lists were identified and the data of these companies were analyzed with linear multiple linear regression. In addition, cluster analysis was used to investigate whether the budget distribution is similar in competing companies in the same sector. Thus, it has been tried to explain whether the competitive parity method has an effect on the budget distribution.

Business Spending

Finding the right balance of spending incurred as a result of business activities has become a more important issue with each passing day. In order to survive, businesses had to make plans these spending considering competitive market conditions.

Differences in the value creation process of marketing and management functions cause the effects of these functions on business performance to be different. Therefore, the need for an in-depth investigation of the relationship between these functions and business performance arises. (Öztürk and Dülgeroğlu, 2016).

Management Spending

Business management has the task of planning, organizing and coordinating the various functions that make up the basic structures of the business together and in harmony.

Since the outputs of management activities are generally handled with the concept of value, it is seen that many functions within this function do not make a direct quantitative difference. Therefore, spending made for management activities can only give qualitative measures, and these qualitative measures create a quantitative value at the end of an indirect methods in process (Öztürk and Dülgeroğlu, 2016).

Marketing Spending

The main purpose of the business is always to make profit and grow. Goods and services must be well marketed in order to realize these purposes.

Marketing provide business outputs to customers and partners by creating value in process. Marketing is a function that creates output and serves the purpose of increase revenue (Daboub vd., 1995). Financial resources are needed to carry out these marketing functions.

Businesses that want to be modern and achieve continuous success can reach their goals as long as they produce value-oriented offers. Therefore, marketing spending, which are a value-oriented function, are considered as an investment that creates value and increases market value. (Topuz and Akşit, 2013). The concept of value can be handled from both quantitative and qualitative aspects. The qualitative aspect of marketing is concerned with which values consumers match with which products and services, and what values are offered to their consumers by the product and service offerings of businesses. Interaction, environment, ownership, knowledge, product are among these qualitative value types (Smith and Colgate, 2007). On the other hand, the quantitative aspect focused on how much monetary value marketing activities offer for shareholders and investors (Doyle, 2000).

In the literature, the effect of marketing spending on many parameters such as growth rates, profitability, brand value of companies, increase revenue has been examined and mostly positive effects have been mentioned.

Promotion Spending

Promotion is the communication used to inform the target audience and persuade potential customers and other interested parties to prefer a product or service (Talpai, 2014).

There are many elements of the marketing mix that enable them to carry out their marketing activities within the concept of promotion.

Main elements of promotion;

- Advertisement
- Personal selling
- Public relations
- Sales development

Of all the spendings items of the business, promotion spending is the most dependent on managerial decisions. Therefore, one of the most important issues related to the concept of promotion is to determine how much budget will be allocated for the

activities included in the promotion. (Emgin and Süngü, 2004). Some methods for setting promotion budget;

- Objectives and task method
- Percentage of sales method
- Affordable or fund available method
- Expert opinion method
- Competitive parity method

Advertising Spending

Advertising, which is the most important element of the marketing function, is the activities carried out in order to announce the products or services by the business to the customers and to persuade them to prefer their own products or services over other products or services.

Advertising spending are not part of production spending, but a very important part of basic spending such as marketing and sales (Çakır and Aslan, 2020). Advertising spend is usually allocated most resource marketing function.

Thanks to the advertising spending, which are considered as a kind of investment tool by the businesses, the products and services that they offer are recognized. The increase in sales will increase the future cash inflow of the business, thus increasing the market value of the company.

R&D Spending

R&D (Research and Development) is a process of reviewing and testing various products and projects before they are implemented. In the R&D process which consists of two separate stages: research and development, issues such as how projects and newly designed products can be made more functional and better, whether they will provide the expected benefits are examined.

All of the direct and indirect spending incurred in the research, development and design activities of the business in the new production and project processes are within the scope of R&D spending (Fidancı, 2017: 72). A comprehensive preliminary study is required for the concretization of R&D studies, this causes the R&D spending of business to be extremely costly.

Many studies have been focused in the literature on how R&D spending affect factors such as companies' growth rates, profitability, brand value and revenue. The results of these studies are generally positive on the said factors, as in marketing spending.

Methodology

Clustering Analysis

The competitive parity method is based on creating the budget in proportion to the amount of spending made by competing brands. (Karaçor and Ceran, 2012). Thanks to the competitive spending method, businesses obtain promotional spending estimates in the sector and monitor their competitors' promotional spendings or create their own budget averages. This method provides the advantage of not falling behind the competitors also avoids unnecessary promotion wars. (Emgin and Süngü, 2004).

In the study, it is aimed to see how the spendings of rival companies in the same sector affect the company spending decisions. For this, it has been examined how much the differences between the sectors can be explained thanks to the clustering analysis to be applied with the R&D and marketing spendings data frame of the businesses.

Clustering is the process of grouping objects through information describing the objects themselves or their relationships with other objects. (Zaiane vd., 2002). The purpose of clustering; is to divide the objects in the group into groups in such a way that they are as similar as possible within themselves and as different as possible from the objects in other groups. (Sayılan, 2019). In addition, it can be concluded that how much the parameters represent the clusters in a clustered data set using the clustering analysis method.

Analyze by the spending amount data which is the subject of the study, would make the company budgets the main parameter in determining the distances of cluster centers and each unit from each other. However, since our main purpose is to analyze the differences in the ratio of spending amounts to budget according to sectors, a new data frame has been created by using the ratios of R&D and advertising spendings to company revenue in our dataset.

The divisive clustering method which is one of the methods that determines the clusters according to the distance of the data from each other, was used for cluster analysis. One of the algorithms based on this method, CLARA (Clustering for Large Applications) clustering algorithm was selected and clustering analysis was performed by R-Studio.

Regression Analysis

There are several factors that affect businesses profit. One of these is the spendings made for business activities.

In this study, multiple linear regression analysis was used to test the effect of R&D and advertising spending, which are among the mentioned spending items, on company profit.

Regression analysis is a method of explaining the relationship between a dependent variable and one or more independent variables by a mathematical equation. (Büyüköztürk, 2011: 91).

The multiple linear regression equation consists of that elements; Each X from X_1 through X_p represents the independent variables and Y represents the dependent variable. Each b from b_1 to b_p are calculated regression coefficients. Also, b_0 equals Y when all elements are 0. The multiple linear regression equation is formulated as follows;

$$Y = b + b_2 X_2 + b_3 X_3 + \dots + b_p X_p + \epsilon \quad (1)$$

Data in this study; It is expressed as R (Revenue), AS (advertising spending), RDS (research development spending) thus regression equation is formed as follows.

$$R = \beta_1 + \beta_2 AS + \beta_3 RDS + \epsilon \quad (2)$$

The statistical representation of the hypothesis test is as follows.

$H_0 : \beta_1 = \beta_2 = 0$ (There is no significant relationship between the variables.)

$H_1 : \beta_1 = \beta_2 \neq 0$ (There is a significant relationship between the variables.)

Data

The data set used in the study was compiled from data which top 2500 companies that made the largest R&D investments in the World in 2019 on the <https://ec.europa.eu/> website and top 100 companies that spend the most on advertising in the World in 2019 on the <https://www.visualcapitalist.com/> website. 53 companies in both lists were identified and the data of these companies were analyzed in the study. In addition, due to the Covid-19 epidemic, which started in 2020 and is still affecting the whole World, the data in 2019 was used in study, since the data of the last two years may cause inconsistency under abnormal conditions.

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