

## **The Effects of Cost Accounting Approaches on Research and Development Competence: An Analysis for Manufacturing Firms**

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### **Extensive Summary**

#### **1. Introduction**

Traditional cost accounting approach, cost determination and calculation techniques have long been used as basic instruments for product development, planning and cost management in both the production and service sectors. In these approaches, product-cost-oriented behavior may limit the full understanding of market expectations, as well as restrict firms' research and development capacities and competencies. In addition, traditional cost accounting systems can also cause managers, who tend to act on reports, to ignore the cost of low volume and more proprietary products, concentrating on the total cost of high volume and standardized products. The fact that traditional cost accounting methods do not depend on the future but relies on past experience also causes businesses to take research and development studies, which are futuristic behavior, on the secondary plan. In order to manage similar problems more accurately, many companies have embraced newer and more modern cost management practices such as activity-based costing, kaizen costing, target costing, value engineering, which have high rates of efficiency and quality-of-effects, as well as traditional cost accounting applications. However, interest and R & D capabilities in research and development activities are an important factor in maintaining the firm's durability and sustainability under uncertainty and risk factors (Ryzhova et al., 2015). In this study, the effects of the cost accounting approach used by the production companies in the development of the above mentioned cost accounting in terms of developments and changes have been examined. In the second part, literature review was carried out to compare traditional and new (modern) cost accounting approaches and the importance of research and development ability was examined. The relationship between research development capacity and cost accounting approaches is presented in this framework. The methodology, measurement tools, hypotheses of the research after the research and application are realized in the direction of the aim and the findings are revealed.

## 2. Conceptual Framework and Research Hypotheses

New cost accounting approaches have evolved with technological change. Modern cost accounting system; focusing on alignment between management, marketing, finance-accounting, production activities, R & D and information-processing systems to achieve targeted success. Expansion of cost accounting can identify cost reduction potentials by means of cost management methodologies that are cost-effective and cost-effective to determine business objectives, and thus, research and development competence can be improved and competitive advantages can be achieved. This has led to the development of a cost accounting approach to the cost accounting system, which involves the preparation and analysis of cost information for management with respect to the relative level of cash flow, market shares, prices and actual costs of unnecessary use of all resources of the operator. Sun and Zhao (2010) found that there is a positive correlation between the cost of new product development and the cost methods used. Everaert and Bruggeman (2002) found that the target cost of new cost accounting approaches is the product design, production cost and development (Davila and Wouters, 2004). In a study conducted by Afonso et al. (2008), it was found that in the sample of Portugal, the productivity of SMEs in the production capacities and the productivity of SMEs were found to be positive market success has been identified as an important factor in the costing technique Innovative cost accounting practices provide a more comprehensive and informative infrastructure than traditional cost approaches, it has been revealed that producers are moving in a market-focused manner and that they have increased capacity to innovate. Dudin et al. (2015) emphasized that effective cost management positively contributed to the industrial processes of enterprises. Innovative approaches have been identified in various studies that have contributed positively to the company's ability to research and develop compared to traditional methods in terms of cost management, cost behavior analysis and cost projections (Novak and Popesko, 2014; Potkány et al., 2012; Olsovska et al., 2016; Dejnega 2010). The rapid change in consumer behavior quickly shortens product lifecycles and drives firms to innovative pursuits. This change helps to design new methods with an ar-ge focus and adopts modern systems instead of classical perspective in cost systems (Ax et al., 2008). The hypotheses for examining in the direction of the information and effects mentioned are:

H<sub>1</sub>: Traditional cost accounting systems have a positive effect on the R&D ability of the enterprises.

H<sub>2</sub>: New cost accounting approaches have a positive effect the R&D ability of the enterprises.

H<sub>3</sub>: Use of traditional and modern cost accounting systems in enterprises affects research and development competence positively.

As a moderator variable in the study, two artificial variables were used as the ratio of research and development expenditures /the enterprises' total expenditure and the asset size, and the hypotheses were formed as follows.

H<sub>4</sub>: The size of enterprises' research and development budgets (expenditures) affects their research development ability positively.

H<sub>5</sub>: Firms' active balance sheet size positively influences research and development competence.

H<sub>6</sub>: The size of the research and development budget changes the severity of the effect of the cost accounting system on the research and development competence as the moderator variable.

H<sub>7</sub>: The asset size changes the severity of the effect of the cost accounting system on the research development competence as the moderator variable.

H<sub>8</sub>: There is a meaningful difference between the research and development competence of enterprises applying new (modern) cost accounting approaches and the research and development competence of enterprises applying traditional cost accounting approaches.

### 3. Methodology and Findings

The questionnaire was prepared in line with the hypotheses, and the objectives of the study were applied to the accounting and auditing industries. The questionnaires were submitted to the production enterprises operating in the organized industrial zones located on the east Anatolian side of Istanbul within a period of 3 months and filled with 106 persons working in 49 companies. By choosing the sample method, the stratified sampling method was chosen and every sector was careful to include the company. The questionnaire consists of two parts. In the first part, there are qualitative and quantitative institutional characteristics of firms and questions. In the second part, there are questions which aim to determine the cost accounting application and research and development (R & D) ability. The questions were formed according to the five-point Likert system. It is not surprising that the empirical scientific approach has been appreciated as a result of the study of the questionnaires. Questions about the cost accounting, variables included in the questionnaire were prepared in a completely original way for this study. The questions about the competence of the enterprises to conduct R & D can be found in Yam et al. (2004). The questionnaire contains the basic variables together with the questions that identify the control variables that increase the scientific capacity of the examiner.

Partial least squares (PLS) method was used for hypotheses using SmartPLS v.3 software. (1) In the first step, the traditional cost accounting approaches (TCAA), new cost accounting approaches (NCCA), mixed cost (2) the size of the asset size (AS) in the second stage and the effect of the R & D budget size (RDBS) on the capacity to make R & D (3) the dependence of inter-variable interactions in the last stage The use of traditional cost accounting practices (TCAA) positively affects the capacity of businesses to perform R & D ( $\beta = 0.243$ ), and the cost method (standard, forecast, or historical). The firms are able to control the cost and the right use of the company makes the firm stronger at the point of resource utilization and encourages the accumulation of more funds for the R & D projects. Hypothesis 1 was accepted according to this finding. Hypothesis 2, which tests the effect of new cost accounting approaches on R & D ability, is accepted ( $\beta = 0.210$ ). New cost accounting practices have positive effects on firms' research and development capacities. Hypothesis 3 was considered ( $\beta = 0.228$ ), which examines the effect of the application of mixed cost approaches on the research and development capacity. Hypothesis 4 was accepted because the effect of the asset size on the ability to research and develop the business was significant ( $\beta = 0.200$ ). The size of the research and development budget is a significant factor ( $\beta = 0.221$ ) that positively affects the ability of the employer to conduct research. Hypothesis 4 and hypothesis 5 were accepted in line with the

respective values. In order to examine the indirect effects as well as the direct effects in the structural model, it was determined that the size of the asset significantly changed the effect of the cost accounting approach on the research development in both the aktives size variable and the RDBS interaction moderator values ( $\beta = 0.216$ ). Hence, Hypothesis 6 was accepted. The RDBS was accepted because it was found to be related value ( $\beta = 0.233$ ) in Hypothesis 7, which does affect the moderator effect. The size of the research and development budget significantly changes the effect of the applied cost method on the R&D.

### **Conclusion and Discussion**

The results of the empirical analysis of the survey, which aims to determine the effects of the cost accounting system on the research and development competence. According to findings, cost accounting approach in manufacturing firms leads to more efficient use of resources and increased productivity. Increased productivity, on the other hand, enhances businesses' research and development budgets and strengthens their capacity and ability to do business. In this context, firms' cost accounting approach affects their research and development ability positively in terms of both traditional and modern methods. The results obtained from the study were compared with those of Afonso et al. (2009) overlap in this direction. Modern cost accounting approaches refer to a philosophy that approaches cost as an integral part of activities and processes, rather than just a unit or total cost-based assessment. Thus, according to conventional methods, new methods are more visionary and future-oriented. Eight of the research hypotheses were confirmed to support this assessment (F-value = 14.304, p-value = 0.000). The result shows that firms using modern methods have a higher research and development ability than those who prefer traditional methods.