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Research Article

Behavioral Managerial Accounting: Cost Behavior, Cognitive Biases, Predictability and Control

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Abstract

The advent of the behavioral aspect in accounting and finance highlights the recognition that investors and managers do not always act rationally. Decision-making processes are acknowledged to be influenced by a combination of rationality and emotions. In this behavioral perspective, individual biases can impact managers, hindering them from making decisions solely on a rational basis. The objective of this paper is to provide a literature review of the main studies performed in the field of behavioral managerial accounting; in particular, the relationship between the behavior of costs, the cognitive biases individuals utilize, the accuracy of cost prediction and control issues. The paper starts by giving a historical review of the origins of behavioral managerial accounting, the first studies conducted in this field, then it continues to review the main studies performed about the effect of cognitive biases on cost behavior, cost predictability, and control issues. Although this paper itself is not an empirical research, it provides insights into the main research performed. It draws the attention of academicians to the most important considerations to think about when performing further studies in the future.

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Öz

Muhasebe ve finansta davranışsal yönün ortaya çıkması, yatırımcıların ve yöneticilerin her zaman rasyonel davranmadıklarının kabul edildiğini vurgular. Karar verme süreçlerinin rasyonellik ve duyguların bir kombinasyonu tarafından etkilendiği kabul edilir. Bu davranışsal bakış açısında, bireysel önyargılar yöneticileri etkileyebilir ve onları sadece rasyonel bir temelde karar vermekte engelleyebilir. Bu çalışmanın amacı, davranışsal yönetim muhasebesi alanında yapılan temel çalışmaların bir literatür taramasını sunmaktır. Özellikle maliyet davranışı, bilişsel önyargılar, maliyet tahmini doğruluğu ve kontrol sorunları arasındaki ilişkiye değinilmektedir. Çalışma, davranışsal yönetim muhasebesinin kökenlerinin tarihçesi ve bu alanda yapılan ilk çalışmalara değinerek başlar. Ardından bilişsel önyargıların maliyet davranışı, maliyet tahmini ve kontrol sorunları üzerindeki etkisi hakkında yapılan temel çalışmaları incelemeye devam eder.

1. INTRODUCTION

In the classical "Contemporary" side of accounting research, the decision-making process related to cost behaviors and management is based merely on information reflected in the accounting reports, analysis of past performance, and forecasts of the future performance made by management. In the contemporary side of accounting, every manager and investor are rational, and everyone is said to have the same information at the same time bearing no cost. However, the emergence of the behavioral side of accounting and finance has put a huge emphasis that investors and managers are not always rational and that each decision-making process is affected by both rationality and emotions. From a behavioral point of view, managers are affected by individual biases which prevent them from making their decisions on a rational basis. One of the earliest studies that investigated the relationship between human psychology and the functions of managerial accounting; and the budgeting process was the study of Argyris (1952). In his study, Argyris aimed to study the relationship between the attitudes of the managers and the process of budget setting. Factors like leadership and motivation of individuals are embedded in this study which is why it was marked as one of the first trials to combine accounting functions and human behaviors to set a new direction in the research and literature.

Devine (1960) argued that the psychological traits of the users of accounting and financial information are significant indicators of the importance of the behavioral side in the theoretical and practical background of accounting. Additionally, Stedry (1960) carried on predicting the relationship between accounting issues and psychology, he attempted to clarify the relationship between the performance of budgets and some psychological factors such as the difficulty of the goal of the budget and individual's motivations and incentives. In his study, Stedry applied the concept of the level of aspiration to budgets to understand the connection between these factors and the performance of budgets.

According to Dyckman and Zeff (1984), the studies performed in the 1960s mark the golden or awakening decade in the accounting field. During these years, Caplan (1966) published his famous work about the relationship between management accounting and behavioral assumptions. He argues that to achieve development in the theory and practice of Management accounting, behavioral assumptions must be analyzed and understood.

The official appearance of the term "Behavioral Accounting" in the literature was marked by the work of Cook's (1967). However, Cook and his paper were heavily criticized and attacked by psychologists such as Selwyn Becker, who claimed that the works performed by accountants are not beneficial to the field of psychology.

At the end of the 1970s, Otley (1978) published a study regarding the effects of budgetary style on the performance and incentives of management. In his paper, he referred to the famous work of Hopwood (1972) about the influence of accounting and financial data on the evaluation of management's performance. It is worth noting that the study of Hopwood (1972) officially became a later Newsletter of Behavioral Accounting.

At the beginning of the 1980s studies in the field of behavioral accounting started to draw more attention as the American Accounting Association established a section relating to the Accounting Behavior and Organization Interest. In 1989, the section established a new journal under the name of Behavioral Research in Accounting.

In the 2000s, critical recognition was given to the studies relevant to behavioral managerial accounting, many scholars including Lukka and Mouritsen (2002), Hopwood (1972), Ittner and Larcker (2002), and Luft and Shields (2001) stated that research strategies must combine both economical and behavioral models to produce significant progress in the field of managerial accounting. According to them, the reliance on both economics and psychology produces more relevant findings than purely utilizing economic models. According to Luft and Shields (2001), there are various disciplines in social sciences including psychology and sociology that contributed to the research and studies in the managerial accounting field. These disciplines provide a better opportunity to clarify significant issues such as the interaction between accounting information and individuals. They also provide strong and complete findings.

It is worth noting that psychology was the most influential discipline in the field of behavioral managerial accounting among the various other social sciences disciplines. Three components of psychology are considered vital for management accounting, and these are social, motivational, and cognitive psychology. Stedry (1960) applied the concepts of motivation psychology in his study that aimed to investigate how influential the budget's goal is on the performance of individuals. On the other hand, Hopwood (1972) used social psychology concepts to study how the performance of employees or team members is affected by the actions of a superior individual (Management). In the same year, Barefield (1972) studied how successful management decisions can be if the different related cost variances were summed up or aggregated. In his study, he used concepts of the cognitive (human thinking) side of psychology. Another notable study is Mock et al. (1972) which aimed at shedding light on the relationship between the thinking styles of employees, the feedback of accounting information, and their effect on decision-making.

As previously mentioned, when the relationship between accounting research and the field of psychology is closely previewed, it is noted that the study of Argyris (1952) was the first study to apply a research combined hypothesis of accounting and sociology. In his study, the relationship between the budget's goal, budget setting, and individuals was investigated. This study reflected the sociological problems relating to groups, which was considered for many years as one of the main topics in that field.

This paper provides a literature review of the notable and most cited studies relating to the relationship between cost behavior and human psychological cognitive biases. Although this paper is not considered empirical, its importance is derived from the fact that it provides a sound literature review on the scarce number of studies conducted in this field.

The paper is structured as follows: the first part provides an introductory explanation of the issue of cognitive biases and cost behavior. The second part explains the research methodology and design followed while preparing this paper. The third part is a review of the methodologies used in the previous research. The fourth part provides a detailed literature review, and the final part provides concluding remarks and insights for future research.

2. COGNITIVE BIASES AND COST BEHAVIOR

One of the main issues in the field of behavioral management accounting is related to information asymmetry, how people analyze this information, and the effect of their cognitive styles on cost behavior, predictability, management, and control. This area of research focuses on the concentration of accounting data and the effect of how data are presented on costs. Additionally, it investigates the effect of cost management on the decisions made by management and how behavioral concepts can be applied when the emergence of specific costs including sunk costs, opportunity costs, and sticky costs.

According to Riahi-Belkaoui (2002), the first stream relating to the concentration of accounting data studies the conditions that limit the decision maker's ability to alter their decisions to changes in accounting policies and procedures. One of the significant studies recognizing this issue is Ashton (1976), the study aimed to indicate how the shift between full or absorption costing to variable costing influences the decisions made by individuals. Some years later, Bloom et al. (1984), analyzed to compare the decisions made by an individual and the ones made by a group because of the change in depreciation methods. Luft and Shields (2001) studied how individuals absorb information in the case of intangible costs capitalization rather than expensing. According to Dearman and Shields (2005), the issue of concentration of accounting data, or what is called "Accounting Fixation" represents a connection between knowledge, ability, and motivation, as the changes in the way costs are accounted for affect pricing decisions.

Lipe (1993) argued that, when the angle of how information is represented is viewed, it is noticed that the formation of information and the way they are framed affect the quality of different decisions, including decisions about cost variances control and investigation.

Shields (1983) stated that the degree of sophistication of employees' performance reports affects the employees' motivation to search and utilize different cognitive heuristics. A few years later, Sullivan (1988) argued that the presentation of information in tables, graphs, and figures is influential

on management decisions about costs. This argument is related to the fact that when information is physically represented, it influences the decision-making process.

Dearman and Shields (2001) indicated that the extent to which employees know cost accounting concepts has a big effect on the performance of costing systems that are based on volumes. Cost accounting literacy influences the estimates and judgments relating to different cost categories in the presence of various forms of resource consumption. Cardinaels (2008) argued that, to explain and understand the effect on the decision-making process that is based on costs, both accounting information complexity and the way information is presented should be studied.

3. RESEARCH METHODOLOGY AND DESIGN

The literature review is seen by many scholars to be a systematic process, which aims to assess, clarify, analyze, and comprehend the present studies noted down by previous academics in any field. A literature review usually holds one of two purposes: Initially, it provides a comprehensive, collective, and concrete sum of the present studies by perceiving their topics, designs, and results. Additionally, a literature review contributes to the expansion of the standing theoretical frameworks.

In this paper, an initial collection and scoping process was conducted to determine the most relevant research in the literature. The vocabulary in the main published studies and other sources of information were examined to determine the most useful terminology to be used in this study. Vocabularies like management accounting, cognitive biases, cost behavior, controls, financial information, absolute values, percentages, and stick costs were checked. Several databases were utilized to investigate the determined terminology during the research, examples include the database of Istanbul University and Google Scholar. During the research, it attempted to benefit from the earliest published literature dated back to the 1950s to the present. Journals like Management Accounting Research, The Accounting Review, Accounting Organization and Society, and Accounting, Auditing and Accountability Journal were utilized for the purpose of this research. Finally, the thesis of Nicola Dalla Via (2011) was also referred to during this research.

4. METHODS USED IN THE BEHAVIORAL MANAGERIAL ACCOUNTING FIELD

It is known that the term “behavioral” is often correlated with laboratory experiments in the literature, however, that does not indicate the nonexistence of other research methods such as surveys and field research. Laboratory experiments dominate most of the studies in the field of behavioral accounting, as they are believed to provide various benefits. First, experiments allow researchers to identify the relationships that exist between the several factors involved. They allow researchers to recognize the causes and effects of different patterns related to the variables of the study. Second, experiments give researchers a strong control of the variables and the whole processes related to the study.

According to Obermaier and Müller (2008), experiments have a higher degree of validity compared with other research methods. This is justified by the fact that they enable researchers to design, control, and manipulate the conditions of the analysis, and this grants more conformity with the theoretical frameworks. When participants of these experiments are investigated, it is found that most of them are students. However, it is noted that, in the field of behavioral managerial accounting, sometimes managers and professionals are targeted, because they have more knowledge and practical experience. Studies concerning both students and professionals in their experiments include Morssinkhof et al. (2009) and Bol and Smith (2010).

Many studies in the literature criticized the inclusion of professionals in laboratory experiments. It is argued that professionals may depart from their behavior in real life during the experiment. This issue has led to the presence of many concerns regarding the validity, and credibility of laboratory experiments since cognitive biases may be involved. Liyanarachchi (2007) argues that business and accounting students may be a better replacement for professionals in many behavioral accounting studies. He relates this to the claim that the realism and validity of the experiment’s conditions are more important than the results themselves. The design of decision-making experiments should be carefully watched. Additionally, the soundness of their theoretical backgrounds and findings should also be investigated, to avoid concerns regarding their validity.

Croson (2005) argues that there are several differences between the experiments conducted in psychological studies and the ones conducted in accounting and economic studies. Psychological experiments involve a huge focus on the context of the study, they also include some deceptive factors that aim to trick the participants. These factors are criticized by accounting and economic studies, and they are considered to be a threat to the validity of the experiments. Accounting and economic studies put a huge emphasis on realism, this justifies the use of financial and monetary variables in their experiments. It is also stated that financial incentives are used, as most economic decision-making theories involve the existence of compensations. Such monetary and financial variables are usually not used in psychosocial studies.

Although laboratory experiments dominate the studies in the behavioral management accounting field, other methods such as market experiments and field experiments exist. Market experiments involve the creation of artificial markets including several buyers and sellers and concerning multiple periods. A notable study employing market experiments is the study of Sprinkle (2000). The study contrasts incentive-based and flat-wage compensation systems and investigates their effect on performance and the learning ability of employees. Market experiments are criticized by many scholars for being costly and lacking realism. On the other hand, field experiments involve similar conditions existing in laboratory experiments, however, field experiments are conducted in a real set of conditions such as real markets or firms. This increases the degree of realism, but it also reduces the level of control exercised by the researcher on the design and the variables of the study.

The use of surveys is the second most used research method in the field of behavioral managerial accounting. Behavioral management accounting surveys are designed depending on other social disciplines such as psychology and sociology; the reliance on these disciplines is useful in studying and measuring concepts like satisfaction, attitude, motivation, optimism, and pessimism. It is also useful in relating these concepts to individuals and their behaviors. According to Shields and Shields (1998), surveys are superior to laboratory experiments when considering studies related to the participative budgeting process. This result was reached by analyzing 47 published studies in this area. Hageman (2008) also states that surveys are more economically feasible to conduct than laboratory experiments, they also allow the gathering of a larger amount of data. In addition to that, surveys have a greater degree of validity and realism. However, they are criticized to be influenced by several biases: namely, the social desirability and the non-response biases.

When studies concerning the relationship between an individual's cognitive biases and cost behavior are considered, it is noted that laboratory experiments are the dominant research methodology in this area. A notable study to be mentioned is the work of Dalla Via (2011) which aimed to study the effect of individuals' cognitive traits, and the format of financial information presented on the cost behavior and predictions. The study assumes that, when a symmetric pattern of costs rather than a sticky one exists, judgments about cost behaviors and cost predictions are assumed to be more accurate. A sticky cost pattern exists when costs increase at a higher rate when the level of sales or activity increases rather than the rate they decrease when sales decrease. Additionally, it was also suggested that the presentation of financial information in percentages rather than absolute values increases the accuracy of cost behavior predictions. Finally, the study proposes that, under a sticky cost pattern, data presented in monetary values are less beneficial than data presented in percentages.

5. LITERATURE REVIEW

The rapid development in technology accompanied by the emergence of high-tech information systems (i.e. ERP systems); increased the opportunity for managers and professionals to have timely, more detailed, and precise financial reports regarding cost management. One of the main problems faced by managers concerning cost behavior is the relationship between changes in sales volume and the corresponding change in costs and resource levels. A notable study that investigates this issue is the study of Anderson et al. (2003), which sheds light on the asymmetry in costs' behavior in relevance to changes in activity volume. The article categorizes costs that increase or decrease with certain changes in activity volume under the name of sticky costs. It also establishes a cost behavior model that relates changes in cost behavior to the adjustments and actions made by managers. Later in the same year, Ittner et al. (2003) indicated that managers and professionals rely on subjectivity and their experiences when they need to make decisions quick and cheap decisions; as a result, it is

concluded that managers do not always utilize mathematical and statistical models when they need to make decisions about costs.

Many studies, including Tversky and Kahneman (1981), Lipe and Salterio (2002), and Cardinaels and Van Veen-Dirks (2010) state that the reliance on subjectivity by managers may result in issues regarding the accuracy of cost behavior predictions. Studies also conclude that the formation of financial information, and the differences in information presentation methods also affect the metal modeling conducted by managers. It is assumed that, if the same information is presented differently, different decisions can be made accordingly. The psychological and cognitive biases of managers affect their mental processing of information and as a result their decisions regarding cost management.

Studies regarding the relationship between changes in costs that accompany changes in the levels of activity or sales; or in other words what is addressed as the issue of "cost stickiness" in the literature began with the study of Anderson et al. (2003), however, this study was criticized for its scope by many researchers, including Anderson and Lanen (2009) and Balakrishnan et al. (2011). It is argued that the study of Anderson et al. (2003) is narrow-scoped as it discusses the factors affecting the issue of cost stickiness only on a firm's basis, no factors related to individual behavior and cognitive biases were included in this study. A few years later Banker and Chen (2006) tried to defend the earlier study of Anderson, in addition to widening the scope of his study to include factors on both the firm and the economy's basis. Factors regarding individuals' behavior and cognitive biases started to be included in the literature with the study of Banker et al. (2011). The study considers the psychological traits of managers such as optimism bias or pessimism bias and relates them to financial data to measure the managers' attitude. The study specifically utilizes the past periods' levels of sales. It considers a decline in the level of sales in the current period compared with the previous ones as an indicator of pessimism. Similarly, an increase in the current period's level of sales compared with the previous ones is taken as an indicator of managers' optimism. The study proposes that subjective measures used by managers along with their behaviors are influential factors concerning cost adjustments and management.

Banker et al. (2000) and Ittner et al. (2003) argue that, when managers must make decisions about costs using accounting data, they must define some assumptions related to the available data, to make their decisions. This process involves applying the managers' subjectivity to take a timely and quick action. However, the using of subjective analysis influences the accuracy of the managers' judgment and decisions. It is argued that individuals have different mental capacities and various mental representation methods. This results in differing outcomes and decisions among managers.

Leinhardt (1995) also concludes that managers need not only to apply their subjectivity to manage cost behavior, they also to infer relationships between the accounting data used in the decision-making process. Managers need to understand the relationships between absolute values and need to be able to convert them into percentages and ratios. This ability is required to find the percentage changes in values and apply these changes in the decision-making process. Guiler (1946), Chatterjee et al. (2000) and Chen and Rao (2007) argue that, while performing simple computational tasks, managers may face some difficulties related to the processing of percentages and ratios; thus, influencing the relationships drawn between accounting data.

Nys and Content (2010) state that, when metal expertise and calculation anchors are used to address complex calculations, the chance to have less accurate estimates between the increasing and decreasing percentages is possible. This may fail to consider any unsymmetrical relationship between these values. According to Reina et al. (2009) to detach the effects of the differences in skills among different individuals from cognitive biases, the psychological and cognitive traits of managers should be taken under control. One of the vital issues in this field relates to the ability of different individuals to understand numeric information, or what is called "numeracy" in the literature.

Evans (2003) draws some important remarks regarding some decisive factors that are failed to be considered in the accounting and financial field; namely, the thinking and decision-making style utilized by different individuals. A clear understanding of the way managers process information, think, and make decisions may yield a better understanding of the relationships drawn between the financial data. The variance between managers who utilize an intuitive thinking style and the ones who

utilize an analytical one is an important issue to be addressed. Intuitive managers are considered to have more reliance on their feelings and emotions when making decisions. On the other hand, analytical managers are more detail and reasoning based. This divergence in the thinking styles yields different outcomes related to the accuracy of cost prediction and the mental techniques applied by various managers.

When taking the studies related to the issue of cost stickiness into consideration, it is noticed that most of these studies establish a linear relationship between the levels of sales and costs. Specifically, when such a linear relationship is considered, it is found that costs increase at a higher rate when sales increase, compared with their decrease as sales decrease. Slovic (1974) concludes that when a positive relationship exists between the cost volume and the levels of sales, the predictions regarding cost behavior are found to be more accurate.

Dalla Via (2011) study the deviations in the level of cost asymmetry. They categorize costs into three categories (sticky, semi-sticky, and non-sticky) and they relate this segregation with the different presentations of financial information (absolute values vs percentages). The precision of cost predictions is studied considering these factors. It is hypothesized that, when a symmetric rather than a stick nature of costs exists, the accuracy in predicting costs' behavior is higher. It is also predicted that, when the same information is presented in a percentage or a ratio format rather than absolute values, the predictability of cost behavior increases. To test the hypothesis a laboratory experiment was conducted; in the experiment, both the degree of cost stickiness (sticky, semi-sticky, and non-sticky) and the presentation of financial information were manipulated. The experiment involved the participation of 78 undergraduate students in which 51% of the sample was allocated to data presented in percentages, and 49% of the sample was allocated to data presented in terms of absolute or monetary values. In the experiment, the participants were seated randomly and were not allowed to communicate with each other. They were also informed that they would be compensated for their participation in the experiment before they started, and they were deprived of the right to use any calculator or mobile phone. The context of the experiment asks the students to assume the position of the CEO of a hotel chain, the chain consists of 20 hotels, and it is willing to acquire another hotel chain also consisting of 20 hotels, the revenues and cost data of the complete chain for the 40 hotels in the year of 2011 was given to participants: both in percentages and absolute values. Participants were also given data relating to the estimates of costs for the chain for the year 2012. Participants were shown both the historical and estimates information together and were asked to draw the relationships between costs and revenues; cognitively. They were also asked to answer a series of questions to understand their cognitive abilities.

Results of the experiment show that participants who were allocated to the percentage-form data are more satisfied with the data than the ones allocated to data presented in absolute values, it is found that the first group considers the data to be complete, and the task of drawing relationships between costs and revenues to be easier. Whereas participants in the second group (i.e. absolute values) assumed a degree of incompleteness in data, and they found the procedure of relating costs to revenues to be harder. It was also found that participants do not tend to draw a linear relationship between the costs and revenues; their cognitive modeling tends to support the sticky pattern of costs. Finally, the hypothesis relating to the relationship between the format of the financial information and the degree of predictions' accuracy was confirmed.

This study is important for both academics and professionals as it is considered one of the first studies that apply a laboratory experiment to address the issue of cost stickiness. The study presents different scenarios to participants, including different formats of financial information and different degrees of cost stickiness. In light of these scenarios, the participants are asked to draw a relationship between costs and levels of sales mentally, it also requires them to identify any trends in cost behavior resulting from such a relationship.

The study also helps academics and professionals consider the mistakes and deficiencies in the financial report preparation process. Such deficiencies are expected to yield inaccuracies in the process of cost prediction and adjustment. On the other hand, it also concludes that, when quick and cheap decisions are needed, both the analytical and the cognitive factors should be considered.

5. CONCLUDING REMARKS

Previous studies in the literature regarding the cost behavior including the issue of costs' stickiness, have not considered individuals to be an effective factor in their analysis. However, the influence of individuals' cognitive biases on cost behavior and predictions of cost patterns should be considered. The fact that managers tend to rely on subjectivity in their decisions regarding cost management raises the issue of cognitive biases and their effect on the precision of managers' decisions.

Studies concerned with the issue of cost behavior confirmed that the presentation of financial information and the different mental capacities of individuals have a huge effect on the precision of peoples' decisions. It was also concluded that the ability to predict the patterns costs move in (i.e. their trend), is associated with the degree of stickiness (i.e. asymmetry) of costs. An important behavioral finding of studies in this area refers to the tendency of individuals to rely on a sticky mental model when data about costs are presented in monetary values. This is clear in the tendency of individuals to boost the increasing behavior of costs more than the equivalent decreasing behavior.

Studies related to the relationships between individuals and cost behaviors should put more emphasis on the issue of the cognitive mental modeling exercised by individuals. The process of the mental modeling of information presented, and how it affects financial decisions should be understood.

As individuals rely more on their subjectivity, the accuracy of their decisions and the financial reports they generate becomes more questionable. To have sound control over such an issue, the cognitive biases utilized by individuals should be deeply understood.

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