

Ranking Psychological Theories with the Accounting-based Approach to Contingency Management using AHP Technique

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Abstract

The theory of psychology focuses on the explanation and prediction of individuals by examining specific behavior rather than the expression of an organization or society and on non-objective phenomena rather than an objective, and its importance for the management of the contingency arises from the fact that the function of the individual at any given time must be evaluated based on his conditions and working situations and due to its complex and diverse dimensions, decision making confronts with several choices and criteria which can be examined by multi-criteria analysis. This applied research aims to rank the psychological theories with an accounting approach based on the management of contingencies using the AHP method. The method of this study was a descriptive survey conducted by distributing the questionnaire. The statistical population of the study consisted of elites and accounting experts with over 20 years of job experience in Tehran. Sixty-eight individuals were selected randomly, and the questionnaires were distributed among them. After collecting the research for data analysis using expert choice software, the research, and ranking of the data were done using the AHP technique. The findings of the study indicate that the motivation theory and social psychology theory, and finally, cognitive psychology theory are based on priority order. In other words, in the accounting-based approach to contingency management, most motivational theories are presented and show a higher impact, one of the most important reasons for which can be attributed to the reliance of accounting on individual management.

Keywords: Prioritization, Psychology Theory, Contingency Management, Multi-criteria decision making, AHP.

Introduction

Contingency management (CM) is a type of interactive involvement that has been particularly valuable and operative. Contingency management relies on behavioral principles and includes the establishment of concrete inducements when users show target behaviors (Tardellia et al., 2018). Contingency theories of management accounting have become a current vogue but have yet to produce significant new results. By surveying the development and content of these theories, it is argued that they have been based on an inadequate and insufficiently articulated model. An improved model, based on ideas of organizational control and effectiveness, is put forward, which suggests

appropriate directions for future work that will be both perceptive and cumulative (Otley, 1980). The contingency approach to management accounting is based on the premise that no universally appropriate accounting system applies equally to all organizations in all circumstances. Rather, it is suggested that particular features of an appropriate accounting system will depend upon the specific circumstances in which an organization finds itself. Thus a contingency theory must identify specific aspects of an accounting system that are associated with certain defined circumstances and demonstrate an appropriate matching. Although the contingency framework is new, management accounting has long recognized its inter-relationship with organizational and behavioural factors, as is exemplified by Horngren's (1972) exhortation to the effect that the design of a (management accounting) system and the design of an organizational structure are really inseparable and interdependent. This research uses contingency research instead of contingency theory to distinguish the contingency method for the study of management accounting. In this sense, contingency orientation is a method for studying management accounting to understand that the operations and properties of management accounting methods are not global. They are contingent on the diverse grounds for applying the methods in those circumstances. In this way, specific theories can be used to predict or outline expected or observed relationships, including economics and psychology theories or a combination of them. This study uses psychological theories that have long been used to study methods of management accounting. The psychology theories indicate that behavior relies on people's representations, which vary in vital ways from objective indicators of the individuals' environment or welfare.

The cognitive representation performs in the operative setting, which stimulates motivations and feelings, and conducts obvious behavior to its objective or aim (Malsch et al., 2014). Therefore, the consequence of a specific kind of management accounting exercise on entities' conduct can hinge not only on how accurately revealing the practice is about issues that influence the entities' prosperity but also on how comprehensible the process is (i.e., how well the individuals can create practical perceptual signs of it and link it to their other mental representations), and how it arouses the persons' responsiveness, thought, and inspiration.

The use of psychology theory in the study of management accounting techniques was begun by Argyris (1953). He examined how social psychology motivations and issues are useful in management accounting (Hall, 2011). The psychology theory focuses on the explanation and prediction of behavior by examining the behavior of a particular person instead of the action of the

organization or society and non-objective phenomena instead of the actual events. Therefore, the psychology theory can be applied in the environment of contingency management accounting to comprehend and clarify the processes and properties of the management accounting methods by investigating how they affect the mental state and individualized behaviors.

The literature has shown that contingency theory is applied in management accounting research in order to address three types of issues which are about: The fit between organizational control and structure, The impact of such fits on performance, the investigation of multiple contingencies and their impact on the organizational design (Abba, Yahaya & Suleiman, 2018).

Contingency-based management accounting research has a long & distinguished history of providing insights into the role and functioning of management accounting practices in organizations. Whilst its shortcomings have been the subject of considerable debate (Otley, 1980; Chapman, 1997; Hartmann & Moers, 1999; Gerdin & Greve, 2004), it remains an important and central field of inquiry in management accounting research (Hall, 2016).

This research aims to rank the psychological theories with the accounting-based approach to contingency management using the AHP technique. To do this, some criteria, including social psychology, motivational psychology & cognitive psychology, considered approaches to psychological theories. The results of this research are important and valuable; Because despite conducting much research in the field of psychology, This issue has been neglected, and there is a space in the literature of accounting and social psychology for research on this issue, which is the motivation for conducting this research. Therefore, this research aims to expand the theoretical literature related to social, motivational, and cognitive psychology with an accounting approach based on contingency management.

Therefore, the research question is raised as follows: What are the criteria of psychological theories with the accounting approach based on contingency management using the AHP technique? First, the theoretical foundations of the research have been proposed to answer this question. Then the theoretical and experimental background is reviewed, and the research methodology is examined. The next part is the research findings obtained as a result of implementing the logical processes of the research method. Validation, discussion, and conclusion about research findings and limitations form the current research's last part.

Since the results obtained in this research have a specific audience (the scientific community in the field of accounting and psychology knowledge), it

is expected that the knowledge produced from it will have a significant contribution to the empowerment of the mentioned groups; Therefore, the main advantage of this research, in addition to the implementation method, is the ranking of psychological theories with the contingency management accounting approach.

Literature Review

Contingency Management Accounting

Contingency theory has been widely used to examine the characteristics of the management accounting system that works best in one organization. Nevertheless, the application of contingency theory has its opponents. Contingency theory emphasizes that the design and functioning of control systems in organizations are contingent upon contextual factors, such as the technology and environment in the organization where these controls operate and function. However, contingent factors that affect the efficiency and effectiveness of the system may well be accepted at the adoption stage but not at the implementation stage (Chenhall, 2003). Thus applying only contingency theory may not be adequate. This is because the implementation stage is more affected by organizational factors rather than contextual factors. Thus, applying other theories, such as organizational theory, may be more suitable (Kamisah et al., 2010).

Contingency theory has been commonly used in management accounting-based research as well as in strategic management (Cadez & Guilding, 2008; Cadez & Guilding, 2012). The essential idea of management accounting contingency theory is based on the assumption that no universally appropriate management accounting system can be applied to all organizations in all circumstances (Otley, 1980). The form or design of the management accounting system applied in an organization should match the situations and conditions in which the organization is operating to enhance performance. The idea of contingency theory is that the organization's performance will be enhanced if a good fit happens between the management accounting and control system and the contextual variables (Kamisah et al., 2010).

The contingency theory of management accounting must identify specific accounting system aspects associated with certain defined circumstances and demonstrate an appropriate matching (Otley, 1980). This indicates three areas to which attention needs to be paid. First, what aspects of the management accounting system are to be explained? In particular, are we concerned just

with the existence of specific techniques in an organization or also with the extent and manner of their use? Studies have tended to be somewhat arbitrary in selecting the techniques they focus on, with little consistency between one study and another in the selection and measurement of variables connected with the accounting control system. Second, how are the defined circumstances to be selected? Again, although the contingent variables used by organization theorists have been extensively used here, often only a subset is used in any study, making comparability difficult. Finally, defining an appropriate matching has caused significant difficulty over the years (Hall, 2016).

Contingency Management Accounting based on the Standard of Psychological Theories

Management accountants are considered information providers and managers as the primary information users in the accounting information system. The application of psychology and behavioral factors in management accounting can be verified from the perspective of management accountants and managers. In other words, do accountants and managers consider all available information in decision-making? Are they logically processing or searching for this information, or can their minds and behavior affect the management accounting and? application of those procedures? In other words, is the behavior of accountants in the use of technology and the provision of information, preparation, and presentation influenced by behavioral inclinations? Do decision-makers act rationally, or can their cognitive and emotional orientations affect decisions? Finally, are the desires and behavioral implications of management accountants and managers individually addressed, or are they interacting with the group, organization, or environmental conditions? In order to answer the questions, management accounting can be examined at micro and macro levels. Behavioral management accounting at the micro level examines considerations and behavioral factors at the individual and group levels in such a way that they differentiate them from the assumed rational actors in classical economics theory (Luft & Shields, 2006).

At this level, behavioral management accounting challenges one of the underlying assumptions of classic financial economics: the rationality of decision-makers. Behavioral management accounting wants to demonstrate that in the real world, decision-makers' behavior is not consistent with the rational nature of the new classical economy. The effects of decision-making tendencies or individual biases on management accounting techniques arise in this area. In other words, management accounting can be distinguished based on the behavioral components in the four regions of the individual, group,

organization, and environmental conditions, as presented in table 1. Considering that the present subject is the study of psychology, the development of the accounting model of behavioral management and the psychological theories governing it is vital. Psychology has many domains, but the psychology theories in the field of management accounting include three areas such as motivational psychology, social psychology, and cognitive psychology (Tardellia et al., 2018). These types are presented in the table 1 as follows:

Table 1. Theories of Psychology

Psychological Theories	Types		subset	
	Motivational Psychology			Ideal Level Theory
				Targeting Theory
				Incompatibility of Cognition Theory
				Justice Theory
				Expectations Theory
				Documents Theory
	Social Psychology			Fittest Environment Theory
				Social Identity Theory
				Role Theory
	Cognitive Psychology	Behavioral Decision Making	Social Adaptation Theory	
			Contingency Judgment	
			Biblical Initiatives	
		Judgment & Decision Making	Vision and Formatting Theory	
			Search Initiatives	
Contingency Functionalism				
		Mental Models		
		Effects of Results (Consequences)		
Source: (Tardelia et al., 2018)				

Motivation refers to processes that instigate and sustain goal-directed activities. Motivational processes are personal/internal influences that lead to outcomes such as choice, effort, persistence, achievement, and? environmental regulation (Schunk & DiBenedetto, 2020). Motivation is a driving factor for action, willingness, and goals. These needs, want, or desires may be acquired through the influence of culture, society, and lifestyle or generally innate. An individual's motivation may be inspired by outside forces (extrinsic motivation) or by themselves (intrinsic motivation) (Ryan & Deci, 2000). Motivation is a process in which thoughts influence behaviors. For example, the performance of stimuli affects people's thoughts and, consequently, human behavior. At each stage of this cycle, attitudes, beliefs, intentions, and efforts affect a person's motivation. According to psychological theories, motivation arises

only within a person, but according to sociocultural theories, motivation results from participation in the cultural activities of social groups (Rueda & Moll, 1994).

Cognitive psychology is the scientific study of mental processes such as attention, language use, memory, perception, problem-solving, creativity, and reasoning (American Psychological Association, 2013). Cognitive psychology originated in the 1960s in a break from behaviorism, which had held from the 1920s to 1950s that unobservable mental processes were outside of the realm of empirical science. This break came as researchers in linguistics and cybernetics, as well as applied psychology, used models of mental processing to explain human behavior. Much of the work derived from cognitive psychology has been integrated into other branches of psychology and various other modern disciplines, such as cognitive science, linguistics, and economics. The domain of cognitive psychology overlaps with that of cognitive science, which takes a more interdisciplinary approach and includes studies of non-human subjects and artificial intelligence.

Social psychology is the scientific study of how individuals' thoughts, feelings & behaviors are influenced by the actual, imagined, and implied presence of others, and imagined and implied presences refer to the internalized social norms that humans are influenced by even when alone (Allport, 1985). Social psychologists typically explain human behavior due to the relationship between mental state and social situation, studying the conditions under which thoughts, feelings, and behaviors occur and how these variables influence social interactions. Social psychology has bridged the gap between psychology and sociology to an extent, but a divide still exists between the two fields. Nevertheless, sociological approaches to psychology remain essential to conventional psychological research (Sewell, 1989). In addition to the split between psychology and sociology, there is a difference in emphasis between American and European social psychologists, as the former traditionally have focused more on the individual. In contrast, the latter have generally paid more attention to group-level phenomena (Moscovici & Markova, 2006).

Management Accounting Based on Psychological Theories

Some investigations aimed to realize and clarify the individual-level properties of management accounting exercises. This includes development from observing the relations between management accounting exercise(s) and individual-level influence on the analysis of contingency relationships; for example, direct relations can arise in some environments but not in others and

will occur in various degrees or secondary methods through a specific emotional mechanism. This typically includes the growth of theoretic models concerning principal and mediator variables. In an intervening variable model, the management accounting variable influences a personal variable, and the mental variable, sequentially, has? Emotional influence on the individual-level consequence (Hall, 2016). For example, participation among people affects their job performance. (Chenhall & Brownell, 1988).

The moderating variable in the current model is psychological theories that affect the consequences at the individual level. (Luft and Shields, 2006). For example, participative budgeting influences managerial performance contingent on a manager's perceived locus of control (such as whether a manager believes luck or the manager's actions control his/her destiny) (Brownell, 1981).

Psychological theories include three areas of cognitive psychology, the psychology of motivation, and social psychology. The three sub-branches are not mutually exclusive. Approaches classified into various subclasses frequently have comparable expectations, and the specified technique can occasionally be applied in more than one subdivision. Cognitive anomaly theory addresses the phenomenon of cognition. How can individuals respond to cognitive understandings that are incompatible in every way? The motivating phenomenon leads to avoiding inappropriate recognition and taking measures to prevent or eliminate them. Also, the social aspect examines how poor understanding influences inter-organizational relationships and the characteristics of others.

Research Background

The literature review of contingency theory inclined is based on earlier outcomes from structural behavior, but one vital stream advanced from contradictory empirical explanations that needed clarification. This was initiated with the study of Hopwood (1972, 1974), who explored the effect of essential directors giving high importance to accounting enactment procedures in measuring the presence of their subordinates. A style later reflected as reliance on accounting performance measures. One of the main consequences of accounting performance measures compared to other measures is their long-term efficiency, which is very important. Otley (1978) purposely selected a condition in which he supposed this consequence would not maintain (i.e., wherever functioning components were typically independent of each other, contrary to Hopwood's highly inter-reliant groups) and established the

contradictory consequences he anticipated. He predicted conditions in which performance components are not dependent on each other and provide different results.

Psychology theory is particularly well positioned to help understand the process through which management accounting practices are developed or changed, particularly in response to changes in the organizational context. This is important because when an organization is in a state of nonconformism, managers cannot simply control what variations are essential to recovering fit (Donaldson, 2001). For instance, once an organization develops in size, managers are still determining how to evade cumulative formalization too much or too little, given that they do not know the exact formalization level to fit the organization's size (Siti Zaleha et al., 2011). This echoes a psychological viewpoint because management accounting performances will be advanced or altered not because of (only) an independent change in structural environment, but by an alteration in persons' mental images of those alteration(s) (Luft & Shields, 2006), in addition to whether those persons own the essential inspiration, information, and aptitude to endorse those changes.

Now, the theory of psychology can have a significant role in considering how conditions of fit in the contingency-based study are realized. This includes an examination of how the opinions and performances of administrative members have a role in familiarizing management accounting practices with appropriate situations (how management accounting performs can impact a person's subjective insights of those appropriate situations) (Speckbacher & Wentges, 2012). Along these lines, the theory of psychology could be applied in contingency-based study to comprehend in what way, how well, and? People in organizations make decisions regarding the familiarity of management accounting with the organizational environment regarding the number of changes in management accounting. Though according to the position of familiarizing the organization with alterations in context, studies stated that firms frequently continue in misfit for lengthy times (Marginson et al., 2014).

Processes of psychology have a role in manipulating a person's answers to fluctuations in the situation and their aptitude to familiarize management accounting practices to attain (or not) fit. For instance, variations in the situation could create a state of cognitive discord, where there is an absence of constancy between thoughts about the structural situation and the suitable performances and practices to follow in that situation, as well as management accounting practices. This absence of constancy can inspire variations in people's conduct to decrease reasoning tension, including altering management

accounting practices. Therefore, they fit better with thoughts about the organizational environment. Nevertheless, the theory of reasoning dissonance designates that people may not adjust their conduct but, as an alternative, take the more shared response of adjusting their thoughts (Venkatesh & Blaskovich, 2012).

For instance, people may optionally ‘forget’ variations in the context to keep their mental steadiness, resulting in the nonexistence of differences in management accounting practices. Thus, cognitive dissonance theory may contribute to explicating how people pursue to familiarize (or not) management accounting practices in the organizational setting. Numerous psychological procedures, like the experience of pressure, could also contribute to this issue. Stress can help people notice more indecision in their job roles, which can be handled (at least partially) by raising some management accounting performances.

For example, Marginson & Ogden’s (2005) findings acknowledged that understandings of role vagueness might yield detailed preparation practices, like a vigorous obligation to budget objectives. Per se, the mental knowledge of role vagueness could clarify why more limited finances can be a suitable reply to involvements of progressive levels of indecision. The surprising issue is the potential dynamic interaction between running accounting practices and mental states in alteration procedures. Namely, the way management accounting performs emotional conditions and how these mental conditions affect the capability of people to alter and adjust management accounting practices. For example, specific types of evaluation and incentive systems (e.g., bonuses related to strict, short-term objectives) may inspire stress on the present condition instead of giving incentives for flexibility & variation; performance measurement systems may direct individual attention to the wrong (or right) areas making it more (or less) difficult for individuals to identify critical changes in the organizational context. Particular budgeting styles could block or hinder (or encourage) potential for emerging information and building novel ideas or ideas that aid persons to be exposed to and classify significant variations in structural settings.

In these ways, management accounting performance could impact how open, adaptive, and receptive persons are to changes in the structural setting and, thus, inspire their incentives for and capability to change management accounting practices to ‘fit’ those new contexts. This also proposes that accepting how management accounting impacts adaptation processes are significant for contingency theory. Management accounting can impact how

managers become conscious of and identify misfits and their incentives and capability to cure them.

Approving a more dynamic viewpoint would require changing the hypothetical representations and approaches applied in contingency-based management accounting investigations. Primarily, as a positive perspective emphasizes consideration of variations in performance and variations in management accounting, this designates a requirement to grow bi-directional instead of uni-directional contributory model methods.

It is significant to accept how variations in management accounting can make a withdrawal, resistance, and opposite properties flow back to impact the process of management accounting practices (Luft & Shields, 2006).

Within studies using survey methods, a shift towards longitudinal rather than cross-sectional designs could prove particularly fruitful (although practically challenging), as it would provide the ability to collect data at different points in time to examine the dynamic relations between variables empirically. As discussed in the next section, field studies are particularly well suited for examining the dynamics of the relations between management accounting practices and psychological processes.

There are some pieces of evidence about applying the contingency theory in accounting and focus on psychological theories; Some of them are as follows:

Haldma & Laats (2002) examines the management accounting practices of Estonian manufacturing companies, exploring the significant impacts on them within a contingency theory framework. The methodology comprises an analysis of 62 responses to a postal questionnaire survey carried out among the largest Estonian manufacturing companies. Findings showed that manufacturing companies had made improvements in their cost accounting methods. However, most respondents acknowledge the importance of these practices in finding and lowering actual product costs and modernizing the cost accounting systems. The effectiveness of an accounting system's design depends on its ability to adapt to external and internal changes. Results found some evidence that changes in cost and management accounting practices are associated with shifts in the business and accounting environment as external contingencies and with those in technology and organizational aspects as internal contingencies.

Luft & Shields (2006) provide a summary graphic representation (maps) of theory-consistent evidence about the causes and effects of management

accounting practices, as presented in 275 articles published in six leading journals. The maps highlight connections and disconnect in the diverse streams of management accounting literature in terms of what has been researched, the direction and shape of the explanatory links proposed, and the level of analysis. Based on criteria from social science research, they offer 17 guidelines to help future research capture natural connections, avoid artifactual connections, and develop a more complete and valid map of the causes and effects of management accounting practices.

Cadez & Guilding (2008) investigated an integrated contingency model of strategic management accounting. They examine the effect of strategic choices, market orientation, and company size on two dimensions of strategic management accounting and, in turn, the mediating effect of strategic management accounting on company performance. A model is advanced and tested using structural equation modeling and data collected from a sample of 193 large Slovenian companies. The validity of the quantitative data findings has been appraised using qualitative data collected in ten exploratory interviews. The study's findings support contingency theory's tenet of no universally appropriate strategic management accounting system, with factors such as company size and strategy having a significant bearing on the successful application of strategic management accounting.

Jasmin & Hul (2012) chronologically reviewed the contingency theory in management accounting research literature. Based on this literature review, contingency theory was summarized as an approach to the study of organizational behavior in which explanations are given for how contingent factors influence the design and function of organizations. Conventional theory studies postulate that organizational outcomes are the consequences of a fit or match between two or more contingent factors. This paper contributes to reviewing the contingent literature concerning management accounting systems. It found that the main problem in contingency-based modeling in management accounting is the operation of fit. This study suggested that researchers discuss explicitly how and whether the precise fit can be relevant to studies that have adopted other forms.

Ivana (2013) investigates various contingency factors that explain the design of management control systems from a Croatian perspective using the contingency approach as a theoretical framework. Data was collected from 47 manufacturing companies in Croatia using a postal questionnaire. The data demonstrate that the type of management control systems utilized by companies is associated with the business strategy, company size, and type but

not with the external environment.

Moghadaspour & Ebrahimi Kordelior (2014) identify factors affecting the development of management accounting in Iran according to contingency theory. Four categories of factors are recognized as affecting factors of management accounting development. In accordance with Shannon's entropy, these are ranked as follows: macro-environmental factors include legal, technological, accountability, economic and cultural factors; organizational factors include size, culture, ownership, human resources, senior management, funding sources, penetration of management accounting knowledge within the organization, technology, and structure of the organization, attributes of management accounting practices includes Relative advantage, complexity, compatibility, observability, and trialability. Worth noting that organizational factors and attributes of management accounting practices ranked the same. Professional environmental factors include localized management accounting software, the presence of professional management accounting associations, the availability of management accounting courses, the availability of management accounting books and magazines, and the presence of a professional management accounting code of conduct. Macro environmental factors and professional environmental factors affect organizational factors. Organizational factors and attributes of management accounting practices affect the development of management accounting. The results of management accounting development are improving activities and business processes, more accurate product pricing, and? more accurate product costing. These are summarized as consequences of management accounting development.

Rahnamay Roodposhti & Rostami Mazoei (2015) identify and summarize relevant literature in psychology and their application in management accounting. Based on this research, psychological theories in management accounting have been classified regarding incentive effects and information impacts. In literature, incentive effects of reference points, the internal contradiction or inconsistency between mental representation and behavior have been broached and analyzed in terms of the theories of target-setting, organizational justice, prospect, cognitive abnormality, predication, and cognition of the environment. Issues such as the effect of information on decision-making, judgments, search method, and processing with limited logic and the individuals' mental representation of the environment and organization have been addressed and expressed in the context of social and cognitive psychology theories. Results indicate that psychological theories with a deeper focus on and deeper understanding of individuals' mental phenomena, rather than objective organizational phenomena, can be used to describe and analyze

the causes and effects of management accounting techniques. Also, the effect of a specific type of management accounting method on individuals' behavior may not depend only on the quality of formal and objective goals for action and the factors that influence people's welfare; instead, the method of understanding people from practical methods and how attention, cognition or incentives stimulate people are also influential. As a result, multiple psychological theories have a potential relationship with each management accounting method.

Mala & Chand (2015) investigated the decision-making process in accounting and auditing for future research from an environmental perspective. This study evaluates all the papers published in 10 accounting journals, among the leading ones from 1980 to 2010, that fall within the domain of judgment and decision-making research. The categorization of the studies reviewed in this paper is based on Bonner's (1999) three significant determinants of judgment and decision-making: person, task, and environment variables. The review highlights the progress in the literature over the past three decades and identifies the methodological limitations of previous research. The review also draws inferences on how judgment and decision-making research in auditing, which is well established, could usefully guide future judgment and decision-making research in financial accounting.

Leite et al. (2016) verify the relationship between management accounting practices and several contingent factors. Contingency theory was used in the analysis model. The study focused on 512 textile and clothing companies of the Portuguese Textile and Clothing Association. Data was collected in the middle of 2014 using a questionnaire. The quantitative study results showed that traditional management accounting practices are more commonly used than modern management accounting practices. In addition to the interdependence found between some of the variables in the analysis model, the results obtained using the multiple linear regression model showed that advanced production technology influences the use of management accounting practices in a positive & direct way.

Hall (2016) identifies and discusses five ways to develop the use of psychology theory in contingency-based management accounting research: stronger linkages between individual and organizational-level studies, a more dynamic perspective on relations between management accounting practices and psychological processes, greater use of field studies in contrast to surveys, examination of the interdependencies between management accounting practices and other types of information & greater focus on the role of

emotions.

Alimoradi and Borzoupour (2017) investigate the relationships between strategy, management accounting systems, and the performance of Iranian petrochemical companies under the contingency theory framework. The study's statistical population is Iranian petrochemical private companies, and the required information has been gathered by questionnaire, and structural equation modeling has been used for data analysis. The results not only confirm the direct association between strategy, management accounting systems, and company performance but also support the effect of the management accounting system as a mediating variable on the relationship between strategy and performance. According to the results, contingency theory postulates are applicable to the Iranian petrochemical industry, and this conclusion may shed some light on how these companies are managed and controlled.

Ong et al. (2018) exploit the quantitative research methodology to understand the relationship between contingent factors: uncertainty in the environment, organizational size, environmental strategy, regulatory pressure, and top management commitment that influence environmental management accounting and environmental performance. Based on the 2,400 companies registered in the Federal Malaysian Manufacturer database, the survey was conducted on manufacturing companies located in Klang Valley. Six hundred questionnaires were sent out to manufacturing companies, and the finding highlights that the uncertainty in the environment, regulatory pressure, and top management commitment significantly affect environmental performance.

Sayadi Somar et al. (2019) analyzed the role of management accountants as strategic advisors for managers based on the contingency theory. For this analysis, the study has identified 14 management accounting tools related to planning, decision-making, and control based on the IFAC classification and 12 influential contingency factors. The data was collected from 117 firms listed in the Tehran Stock Exchange through responses to a standard questionnaire. The findings showed that nine contingency factors of human resources, economic environment, organizational structure, the professional sector, technology, competitive environment, cultural factors, company size, and organizational strategy are the influential factors in using management accountants' information for company planning and decision making. Three contingency factors of the external environment, financial resources, and senior management support lack significant effects on using management accounting reports. The two factors of the economic environment and the external

environment are the most critical barriers to the use of the reports of management accountants. Therefore, it is suggested that managers consider the strategies presented in the reports of management accountants for planning, decision-making, and control of operations in the turbulent environment of the country.

Sayadi Somar & Sabzali Poor (2020) test the contingency model of influencing factors on the philosophy of value creation and the effective use of corporate resources. Research results are based on the data of 117 companies accepted in the Tehran Stock Exchange for ten years (2009-2018) using the structural equation modeling approach. Implying the effect, eight contingency factors of human resources, economic environment, external environment, organizational strategy, technology, competitive environment, financial resources, and senior management support are significant in using the information of management accountants for value creation and effective use of corporate resources. In comparison, four contingency factors do not significantly affect the use of management accounting reports. Also, the conclusion Matrix Importance-Performance shows that attention to contingency factors, competition power, new technologies, economic environment, R&D expenditures, the degree of compliance with environmental uncertainty, the performance of the human capital index and corporate governance structures is the key to creating double value in activities and effectiveness in resource utilization companies. Also, among the possible factors, technology and human resources are the most influential factors.

Elhossade et al. (2020) examine the impacts of institutional pressures on adopting environmental management accounting by manufacturing companies operating in Libya. The study examines how such adoption is impacted by four contingent factors: company size, company age, environmental management system adoption, and business type. The results showed that organizational pressures and possible factors are moderated against the level of acceptance of management accounting. Also, The results indicate that the relationship between coercive pressures and environmental management accounting adoption varies as a function of company size. So, when companies face pressures, how they respond depends on specific circumstances and characteristics of the company, such as company size.

Yaghoubian et al. (2021) present a contingency model of performance evaluation of firms emphasizing the role of modern management accounting tools. The research data have been gathered from the financial statements and other reports of 85 firms listed on the Tehran Stock Exchange from March

2015 to March 2018, as well as a questionnaire distributed among the financial managers of these firms at the end of 2018. The structural equation modeling approach and SmartPLS software have been used for modeling. The results showed that using modern management accounting tools significantly positively affects the firm's performance. Also, the study findings indicate that the relationship between modern management accounting tools and firm performance is significantly and positively moderated by three contingency factors: market competition, environmental uncertainty, and company size.

Research Methodology

Decision-making is an integral part of all managers' jobs. There are numerous types of decision-making problems that a typical manager has to deal. Most of these decision-making problems involve multiple criteria. Frequently, management. Decision-making problems involve multiple criteria/ objectives/ attributes. Over the years, many quantitative methods have been developed to facilitate this, making rational decisions involving multiple criteria. One such method is the Analytic Hierarchy Process (Saaty, 1977). The AHP is generally regarded as one of the most successful techniques for solving decision-making problems involving multiple criteria. Since its development, AHP has been successfully applied to solve a wide range of multi-criteria decision-making problems (Rafikul & Abdullah, 2007).

The systematic hierarchical method is one of the most common methods for multi-objective solving. The process of hierarchical analysis reveals the usual conduct and human thinking. This method investigates complicated issues according to their connections and makes them more straightforward. A process of hierarchical analysis can be applied when a decision-making exercise encounters various opposing selections and decision standards. The suggested methods can be measurable and qualitative. The foundation of this administrative procedure is based on the opposite hidden assessment. The decision maker begins by offering a decision hierarchy tree. The decision hierarchy tree shows the associated issues and the opposing selections assessed in the resolution. At that time, sequences of paired evaluations are carried out. These evaluations display a load of each issue consistent with the opposing choices assessed in the resolution. Lastly, the rationality of the hierarchical study procedure assimilates the conditions stemming from the paired contrasts to assume the ideal choice.

This study is an applied and descriptive survey. The data was gathered through field-library research using scientific resources and valid scientific

databases. The questionnaire used in the present study was used from the research of Schunk & DiBenedetto (2020). The statistical population of this research is made up of accounting experts who have more than 20 years of work experience. From a demographic point of view, about 60% are men, and 40% are women. Having collected the research data for analysis of raw data, the researcher analyzed the descriptive statistics and finally examined the ranking of psychological theories with an accounting approach based on contingency management using AHP Technique. The AHP is generally regarded as one of the most successful techniques for solving decision-making problems involving multiple criteria. Since its development, AHP has been successfully applied to solve a wide range of multi-criteria decision-making problems (Rafikul & Abdullah, 2007). The hierarchical analysis process is one of the most comprehensive systems designed for decision-making with multiple criteria; Because by using this technique, it is possible to make the problem hierarchically in the form of equations and consider different quantitative and qualitative criteria. This process involves different options in decision-making and allows sensitivity analysis. It provides over-criteria and sub-criteria. Also, this process is based on paired comparison, with the possibility of facilitating judgments and calculations. In addition, it shows the degree of compatibility and incompatibility of the decision. These are a set of essential advantages of multi-criteria decision-making.

Findings

In this section, according to the data collected by the questionnaire, it has been tried to use the appropriate descriptive and inferential statistical techniques to analyze the data. Collected data for analysis should be converted into valuable information in the form of statistical tests to obtain the results by interpreting them. The test used in this study is a Friedman one-sample t-test.

Table 2. Final ranking based on organizational structure components

	Social Psychology	Motivational Theories	Cognitive Psychology
Normalized Weights in AHP (W_j)	0.1101	0.1221	0.1111
Values of Normalized d_j^-	0.1011	0.1479	0.1014
Values of Un-Normalized d_j^+	0.1032	0.1141	0.1031
AT_j	0.1049	0.1427	0.1092
Rank in AHP	3	1	2

The information in the above table shows that the most important factors among the components related to the organizational structure are the following, respectively: motivational theories, cognitive psychology & social psychology.

Table 3. Friedman test results on the prioritization of indicators related to organizational structure

Motivational Theories	2.05
Cognitive Psychology	1.99
Social Psychology	1.96
Statistical Results	Value=3.24 df=2 sig=0/000

Table 4. Final ranking based on technology components

	Motivational Theories	Social Psychology	Cognitive Psychology
Normalized Weights in AHP (W_i)	0.1141	0.1031	0.1061
Values of Normalized d_i^-	0.1166	0.1001	0.0983
Values of Un-Normalized d_i^+	0.1163	0.1048	0.1039
AT_i	0.1204	0.1014	0.0976
Rank in AHP	1	2	3

The above table shows that motivational theories (0.1204), social psychology (0.1014), and cognitive psychology (0.097) are, respectively, the most important factors among the components related to technology.

Table 5. Friedman test results regarding the prioritization of technology-related indicators

Motivational theories	2.07
Social psychology	1.98
Cognitive psychology	1.96
Statistical results	Value=4/32 df=2 sig=0/000

Table 6. Final ranking based on the components of the organizational environment

	Motivational Theories	Social Psychology	Cognitive Psychology
Normalized Weights in AHP (W_i)	0.1141	0.1201	0.1071
Values of Normalized d_i^-	0.1166	0.1287	0.1072
Values of Un-Normalized d_i^+	0.1163	0.1293	0.1126
AT_i	0.1204	0.1215	0.1086
Rank in AHP	2	1	3

The above table shows that social psychology (0.1215), motivational theories (0.1204), and cognitive psychology (0.1086) are, respectively, the most important factors among the components related to technology.

Table 7. The results of Friedman's test on the prioritization of indices related to the organizational environment

Social Psychology	2.52
Motivational Theories	2.01
Cognitive Psychology	1.98
Statistical Results	Value=5/15 df=2 sig=0/000

Table 8. Final ranking based on the components of the organizational environment

	Social Psychology	Motivational Theories	Cognitive Psychology
Normalized Weights in AHP (W_i)	0.1241	0.1111	.0456
Values of Normalized d_j^-	0.1465	0.1105	0.1282
Values of Un-Normalized d_j^+	0.1264	0.1092	0.1226
AT_j	0.1302	0.1215	0.0115
Rank in AHP	1	2	3

The above table shows that social psychology (0.1302), motivational theories (0.1215), and cognitive psychology (0.1156) are, respectively, the most important factors among the components related to technology.

Table 9. Friedman test results regarding the prioritization of organizational environment indices

Cognitive Psychology	2.10
Motivational Theories	1.96
Social Psychology	1.94
Statistical Results	Value=2/39 df=2 sig=0/000

Table 10. The weight of the obtained factors according to the responses given in the questionnaire and FAHP method.

Components	Weight	Rank	Factors	Weight	Sum of Weights
Technology	0.166	First	Motivational Theories	0.234	0.039
			Social Psychology	0.246	0.041
			Cognitive Psychology	0.089	0.015
Organizational Structure	0.157	Second	Motivational Theories	0.644	0.101
			Social psychology	0.186	0.029
			Cognitive Psychology	0.17	0.027
Organizational Environment	0.156	Third	Social Psychology	0.5	0.078
			Motivational Theories	0.5	0.078
			Cognitive Psychology	0.191	0.019

The validity and reliability of the current questionnaire were obtained using Cronbach's alpha and SPSS software, the results indicated that Cronbach's alpha coefficient was higher than 0.7, and as a result, the questionnaire has sufficient validity and reliability. In the above table, the obtained components include organizational structure, organizational environment, human resources, and technology; each of the components consists of three criteria of motivation theories, social psychology, and cognitive psychology theories; the weight of the first criterion is 0.157, the criterion The organizational environment is 0.156, the human resource criterion is 0.118, and finally the technology criterion is 0.166.

Discussion and Conclusion

According to experts and accountants, the findings of this investigation demonstrated that the theories of motivational psychology, social psychology, and finally, theories of cognitive psychology at the level of structure of contingency management have the most effect on decision making, respectively. In other words, the subset of motivational theories, namely the opinion of the ideal level, the theory of goal setting, the doctrine of incompatibility of knowledge, the theory of justice, the theory of expectations, the method of documents & the opinion of the adaptability of the environment, have the most impact on decision making at the level of organizational structure. As with organizational structure later, it was determined that motivational psychology theories, social psychology, and cognitive psychology theories, in terms of the dimension of technology of contingency management, have the most significant effect on decision making. From the human-resource aspect of contingency management, it became explicit that cognitive psychology, psychosocial motivation, and social psychology theories impact decision-making most. In other words, the subset of theories of cognitive psychology, the method of behavioral decision-making (probability judgments, vision theory and formatting, search initiatives, and probabilistic functionalism), and judgment and decision-making function (mental models and outcome effects) have the most significant impact on a decision at the organizational structure level. In general, the results of the research to prioritize psychological theories with an accountability management approach using the AHP technique showed that motivational theories, theories of social psychology, and theories of cognitive psychology, respectively, are essential. In other words, most of the motivational theories are presented in the contingency management-based accounting approach. They have higher impacts because they depend on the accounting discipline on individual

calculations. This study complements and extends existing discussions of psychology-based studies. The results provide insights into the content of this research stream and, thus, serve as a valuable source for researchers seeking an overview of investigations drawing on different subfields of psychology. Therefore, in addition to the psychological theories used in management accounting research summarized in this research, it is suggested to review the contemporary psychology literature of many other theories in the sub-branches of cognitive, motivational, and social psychology, as well as theories from other sub-branches. such as neuroscience) which have not been used much in management accounting research but can be practical and relevant in the future. One of the limitations of the current research is that although the specific psychological theories used in management accounting research are diverse and numerous, a limited number of similar topics appear to be grouped under the title of motivation and information effects of management accounting methods. Therefore, this is considered a limitation in the research.

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References

- Abba, M., Yahaya, L., & Suleiman, N., (2018). Explored and Critique of Contingency Theory for Management Accounting Research, *Journal of Accounting and Financial Management*, 4 (5), 40-50.
- Alimoradi, A., and Borzoupour, S., (2017). Strategy, Management Accounting Systems, and Performance of Iranian Petrochemical Companies in the Light of Contingency Theory, *Iranian Journal of Oil and Gas Science and Technology*, 6 (2): 61-74.
- Allport, G. W (1985). The Historical Background of Social Psychology. In G. Lindzey and E. Aronson (ed.). *The Handbook of Social Psychology*. New York: McGraw Hill. p. 5
- American Psychological Association, (2013). Glossary of psychological terms. [Apa.org](http://apa.org). Retrieved 2014-08-13.
- Argyris, C., (1953). Human problems with budgets. *Harvard Business Review*. 31 (1), 97–110.
- Brownell, P., (1981). Participation in budgeting: locus of control and organizational effectiveness, *The Accounting Review*, 56, 844–860.
- Cadez, S., & Guilding, C. (2008). An exploratory investigation of an integrated contingency model of strategic management accounting, *Accounting, Organizations, and Society*, 33(7-8), 836–863.
- Cadez, S., & Guilding, C. (2012). Strategy, strategic management accounting, and performance: a configurational analysis. *Industrial Management & Data Systems*, 112(3), 484–501.
- Chapman, C., (1997). Reflections on a contingent view of accounting, *Accounting, Organizations, and Society*, 22 (2): 189–205.
- Chenhall, R., (2003). Management control systems design within its organizational context: findings from contingency-based research and directions for the future, *Accounting, Organizations, and Society*, 28 (2-3), 127-168.
- Chenhall, R., Brownell, P., (1988). The effect of participative budgeting on job satisfaction and performance: role ambiguity as an intervening variable, *Accounting, Organizations and Society*, 13, 225–233.
- Donaldson, L., (2001). *The Contingency Theory of Organizations*. Sage Publications, Thousand Oaks, CA.
- Elhossade, S.S., Abdo, H. and Mas'ud, A. (2021). "Impact of institutional and contingent factors on adopting environmental management

- accounting systems: the case of manufacturing companies in Libya," *Journal of Financial Reporting and Accounting*, Vol. 19 No. 4, pp. 497-539.
- Gerdin, J., & Greve, J., (2004). Forms of Contingency Fit in Management Accounting Research a Critical Review, *Accounting, Organizations, and Society*, 29 (3-4): 303-326.
- Haldma, T., & Laats, K., (2002). Influencing contingencies on management accounting practices in Estonian manufacturing companies. *Management Accounting Research*, 13(4), 379-400.
- Hall, M., (2011). Do comprehensive performance measurement systems help or hinder managers' mental model development? *Management Accounting Research*. 22 (2),68–83.
- Hall, M., (2016). Realising the richness of psychology theory in contingency-based management accounting research. *Management Accounting Research*, pp. 31, 63–74.
- Hartmann, F., & Moers, f., (1999). Testing contingency hypotheses in budgetary research: an evaluation of the use of moderated regression analysis, *Accounting, Organizations, and Society* 24 (4): 291-315.
- Hopwood, A., (1972). An empirical study of the role of accounting data in performance evaluation, *Journal of Accounting Research*, 10, 156–182.
- Hopwood, A., (1974). Leadership climate and the use of accounting data in performance evaluation, *The Accounting Review*, 49, 485–495.
- Ivana, Dropulić, (2013). The Effect Of Contingency Factors on Management Control Systems: A Study of Manufacturing Companies in Croatia, *Economic Research-Ekonomska Istraživanja*, 26 (1), 369-382.
- Jesmin, Islam, Hui, Hu, (2012). A review of literature on contingency theory in managerial accounting, *African Journal of Business Management*, 6(15), 5159-5164.
- Kamisah, I., Zainuddin, S., & Sapiei, N.S., (2010). The Use of Contingency Theory in Management and Accounting Research, *Journal of Accounting Perspectives*, 3, 22-37.
- Leite, A.A., Fernandes, P.O., & Leite, J.M., (2016). Contingent factors that influence the use of management accounting practices in the Portuguese textile and clothing sector, *The International Journal of Management Science and Information Technology*, 19, 59-77.

- Luft J., & Shields M., (2006). Mapping Management Accounting: Graphics and Guidelines for Theory-Consistent Empirical Research, *Handbooks of Management Accounting Research*, 1, 27–95.
- Mala, R., & Chand, P., (2015). Judgment and Decision-Making Research in Auditing and Accounting: Future Research Implications of Person, Task, and Environment Perspective, *Journal of Accounting Perspectives*, 14 (1), 1-50.
- Malsch, B., Guénin-Paracini, H., Paillé, A., (2014). Fear and risk in the audit process. *Accounting, Organizations & Society*, 39 (4), 264-288.
- Marginson, D., & Ogden, S., (2005). Coping with ambiguity through the budget: the positive effects of budgetary targets on managers' budgeting behaviours, *Accounting, Organizations & Society*, 30 (5), 435-456.
- Marginson, D., McAulay, L., Roush, M., van Zijl, T., (2014). Examining a positive psychological role for performance measures. *Management Accounting Research*, 25 (1),63–75.
- Moghadaspour, H., & Ebrahimi Kordelior, A., (2014). The Presentation of Model of Management Accounting Development in Iran, *Journal of Management Accounting & Auditing Knowledge*, 3(10),73-106(in Persian).
- Moscovici, S; Markova, I (2006). *The Making of Modern Social Psychology: The Hidden Story of How an International Social Science was Created*, 1st Edition, Cambridge, UK: Polity Press.
- Ong, T.S., Heng, T.B., Selley, S., & Magsi, H.B., (2018). The relationship between contingent factors that influence the environmental management accounting & environmental performance among manufacturing companies in Klang Valley, Malaysia. *International Journal of Economics and Management*, 12 (1), 205-232.
- Otley, D., (1978). Budget Use and Managerial Performance, *Journal of Accounting Research*, 16 (1): 122–149.
- Otley, D., (1980). The contingency theory of management accounting: achievement and prognosis, *Accounting, Organization & Society*, 5 (4), 413–428.
- Rafikul, I., & Abdullah, N.A., (2006). Management decision-making by the analytic hierarchy process: a proposed modification for large-scale problems, *Journal for International Business & Entrepreneurship Development*, 3 (1/2), 18-40.

- Rahnamay Roodposhti, F., & Rostami Mazoei, N., (2015). A review of psychological theories in management accounting research, *Management Accounting*, 8(26), 1-20 (in Persian).
- Rueda, R., & Moll, L.C. (1994). Chapter 7: A Sociocultural Perspective on Motivation. In O'Neill Jr HF, Drillings M (eds.). *Motivation: Theory and Research*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Ryan, R.M, & Deci, E.L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*. 55 (1): 68–78.
- Saaty, T.L. (1977). A scaling method for priorities in hierarchical structures, *Journal of Mathematical Psychology*, 15, 234–281.
- Sayadi Somar, A., & Sabzali Poor, F., (2020). Management Accounting Tools rings missing value creation; empirical testing contingency theory, *Journal of Accounting Advances*, 12 (1), 213-237 (in Persian).
- Sayadi Somar, A., Rahnamay Roodposhti, F., Pourzamani, Z., & Nikoomaram, H., (2019). Analysis of the Role of Management Accountants as Strategic Advisers, Based on Contingency Model, *Journal of Accounting Knowledge*, 10 (3), 89-138 (in Persian).
- Schunk, D.H., & DiBenedetto, M.K., (2020). Motivation and social cognitive theory, *Contemporary Educational Psychology*, 60(January), 101832.
- Sewell, W. H (1989). Some reflections on the golden age of interdisciplinary social psychology. *Annual Review of Sociology*. 15:1-17.
- Siti Zaleha Abdul, R., Abdul Rahim Abdul, R., Wan Khairuzza-man Wan, I., (2011). Management accounting systems in Islamic and conventional financial institutions in Malaysia. *Journal of Islamic Accounting and Business Research*, 2, 153-176.
- Speckbacher, G., & Wentges, P., (2012). The impact of family control on the use of performance measures in strategic target setting and incentive compensation: A research note. *Management Accounting Research*, 23, 34-46.
- Tardellia, V.S., Pádua do Lago, M.P., Mendez, M., Bisaga, A., & Fidalgo, T.M., (2018). Contingency Management with pharmacologic treatment for Stimulant Use Disorders: A review, *Behaviour Research, and Therapy*, 111, 57-63.

- Venkatesh, R., Blaskovich, J., (2012). The mediating effect of psychological capital on the budget participation-job performance relationship. *Journal of Management Accounting Research*, 24,159-175.
- Yaghoubian, S.M., Jamshidi Navid, B., Ghanbari, M., & Nademi, A. (2021). A Contingency Model of performance evaluation: emphasizing the role of modern management accounting tools, *Journal of Management Accounting and Auditing Knowledge*, 10 (37), 113–127 (in Persian).

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