



Metacognition and Decision Making in Management Accounting Students

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ABSTRACT

Competitive and skilled management accountants are needed for the companies' survival in an ever-changing world and also a world without borders. Therefore, the problem is what components in a decision maker brings out the best decision. Since learning is continuous and continuous learning is essential in an ever changing world in order for the company to survive. The aim of this study is to determine the effect of metacognition on management accounting students' decision. To reach this aim 83 graduate students of Islamic Azad University of Tehran have been studied in 2017 using three questionnaires. Path analysis and factor analysis have been conducted simultaneously in PLS software. The results show that the correlation between metacognition and management accounting students' decision (what it is) is negative. And also the relationship between metacognition and management accounting students' decision in practice (what it should be) is negative. The study concludes that although metacognitions' aim is to bring out competitive learners, it does not necessarily make innovative decision-makers. Also centralized management in low-privatized countries could affect innovation in decision making

Keywords:

Metacognition, Management accounting, decision making, what it is, what it should be.



1. Introduction

New changes are happening every day in the business world, therefore sound and timely decisions for the companies' survival are becoming more important and also trickier to make. Globalization itself introduced us in to a world with various cultures and therefore different needs, technology is upgrading rapidly and the changes in communication facilities has led to different opportunities and also risks for the business. Since human resource in today's world is transferred easily to different countries with different ideologies, and the human resource from different environments itself, possess different sub-cultures and ideologies, managing them is important for the companies' survival.

One important challenge that managers should be concerned about nowadays is being able to face different type of employees with different backgrounds and turn them in to useful resources for the company in an ever-changing world. Gaining competence abilities is essential for survival. Competent employees who are continuous learners could raise the companies' game. Management accountants as business employers are information tool makers for the company. The tools management accountants introduce to the company based on the knowledge behind it shows what position they really are taking in the company. A hindsight controller has the least knowledge of what tool is best for the companies' future and what competition tools the company needs compared to a foresight innovative manager. Therefore, for the company's sake, management accountants should gain the skills to act as innovative decision makers at the top of the organization. Meaning that, their strong knowledge of the decisions they make, is power for the company.

In pace with changing of the worlds' knowledge and technology, management accounting knowledge is also altering very fast (Sorensen, 2009), and management accountants need to keep up with this change. If not so, either they will be eliminated from the company or chances are that the company would take the fall. Therefore, management accountants' knowledge is an important factor for the company's success. Since knowledge is changing in a rapid speed it is fair to say that technical management accounting competence is not sufficient for educating professional management accountants and needs to be complemented by other competencies such as critical

and creative thinking, learning what and how to learn, when to use various learning strategies, lifelong and continuous learning, and also effective communication skills (American Accounting association as stated in Abbasi, 2013). Therefore, management accountants' metacognitive skills could be a competitive advantage for them in an ever changing environment. These skills enable them to monitor, control and regulate their own knowledge continuously by regulating their learning.

Furthermore, past research has considered the effect of the environment on management accountants' decision while their mentality has been overlooked. The change of observable factors such as environment, organization, management accountants' information system has changed management accountants' tools in developed countries (Otley, 2016). Nevertheless, since management accountants of both organizations in developed and underdeveloped countries have different cultures and ways of thinking different approaches and therefore different techniques can be introduced by them.

In addition to different technology, organizations, information systems culture has a major impact on management accountants' tool of choice. Employees from different countries with different backgrounds have different ideas about suitable techniques. Earlier it was mentioned the techniques management accountants introduce to the company determines their position and role in the company. One might consider the techniques management accountants introduce to the company could introduce the company in to the competitive world and help them thrive. Overall, today's companies need innovative management accountants who are empowered to make useful decisions for the company.

Management accountants as the company's information making employees especially need to be aware of these differences. Today's complex business environment which is under attack by numerous different variables outside the company needs information providers. Thus teaching a set of defined techniques would not be much of a help for management accountants. In contrast, Innovative management accountants who could make sound decisions about useful information and also could invent good management accounting tools are valuable for the company. Change of management accountants' skills would take them to the top of the company were the goals and decision are made. In this essay we

discuss the relation of management accountants' idea of their own knowledge, their power to regulate it and the techniques they believe that are suitable for today's companies.

Our study contributes to the literature of management accounting education and the changing role of management accountants in the domain of behavioral management accounting. Past research has considered the effect of metacognition on decision making (Ormond et al, 1991), but since they were conducted in other domains it is unlikely that their results would be completely relevant for the management accounting domain. And also past research (Shariati et al, 2017; Shariati, Talebnia and Royae, 2018) has studied the indirect effect of metacognition on management accountants' decision, while in this research the direct effect has been studied. The purpose of this study is to discuss the change of management accountants' role by changing their learning abilities.

The remainder of the paper is structured as follows. The next section reviews The research's background. Then, we discuss the research method, and present the empirical material. The paper concludes with a discussion of our results, limitations, ideas for future research.

2. Literature Review

2.1. Metacognition

Management accounting students in all over the world attend different educational institutions. Each institution is shaped in the ideological background of the country and is affected by it. Other than that, when these students start working, the country's culture and ideology shows itself in every decision they make by effecting it. Therefore, different management accounting decisions and techniques with different ideological backgrounds is introduced to the company. In other words, their environment factors have chosen their way of thinking and therefore their techniques.

The decisions that management accountants make based on their thought process defines their role in the company. In order for the companies to survive and succeed in a competitive world, management accountants should be able to manage their way of thinking. Management accountants in different countries need to know what they know and manage their knowledge in advance to change their role in the

company. That means they need to gain metacognitive skills. Past researches show individuals, who have more developed metacognitive skills, are also better problem solvers (Safari, & Meskini, 2015), decision makers and critical thinkers compared to others (Dawson, 2008).

Flavel (1976) who coined the term of metacognition believed metacognitive knowledge consists primarily of knowledge or beliefs about what factors or variables act and interact in what ways to affect the course and outcome of cognitive enterprises (Flavel, 1979). Nelson (1996) also describes Metacognition as two interrelated levels of cognitive processes, the object-level and the meta-level. In his definition the meta-level contains a dynamic model of the object level. That means the meta-level is to control the object-level. He says there are two dominance relations between the two levels: control and monitoring. Meta-level controls the object-level by initiating an action, continuing an action or terminating an action. The information on which control is based flows from the object-level to meta-level (monitoring). In this way a system that uses itself as a tool for monitoring its own behavior may use the achieved result of self-evaluation as an input to alter the system's behavior. With these strategies one could gain more complete knowledge. As it is further elaborated in the further section Schraw and Dennison (1994) believe Metacognition includes cognitive knowledge and cognitive regulation. These components help learners with different level of skills to expand their abilities.

Obviously knowledge is expanding in a rapid rate. Since knowledge and one's decision skills are related, novices and experts difference in performance is related to their different level of knowledge and pattern of thought. Past research in cognitive psychology indicates that, relative to novices, individuals who are experts have more complete knowledge, better cross-referencing and memory organization, and that they have richer decision strategies and more appropriate mechanisms for appraising such strategies (Chase and Simon, 1973; Chi et al., 1981). Therefore, it is reasonable to assume management accountants' cognition limits their framework of thinking and affects their decision making process (Belkaoui, 1987). Hence, management accountants with less knowledge make optimal decisions in a very limited framework. In order for

them to make the best decision they ought to expand their framework. Therefore, management accountants with more complete knowledge may have a more expanded framework. This framework allows them to move from making optimal decisions toward making best decisions.

On the other hand, teaching all of the management accounting knowledge and expanding the curriculum seems to be an impossible and ineffective solution. But giving management accountants the knowledge of constant learning could give them power to survive in an ever-changing world. Therefore, management accountants' metacognitive skills could be a competitive advantage for them in an ever changing environment. These skills enable them to monitor, control and regulate their own knowledge continuously by regulating their learning.

2.2. Decision making in management accounting

Management accountants as information system designers, make tools appropriate for the company's information needs. There are two types of designers: the first type accepts the status quo and designs an information system according to the manager's demand. The second type sees the problem as its own and provides a solution for the manager. Meaning that type one gets managed, while type two manages the situation. The first type has a more hindsight approach while the second type possess a more foresight approach. These two types of decision are based on the management accountants' way of thinking which result is different management accounting tools.

Abdel-Kader (2006) has discussed management accounting tool changes historically and according to the environmental changes. He has based his discussion on IFAC's management accounting development model. This model has four stages as mentioned below:

- Stage 1: cost determination and financial control (CDFC)
- Stage 2: information for management planning and control (IPC)
- Stage 3: reduction of waste in business resources (RWR)
- Stage 4: creation of value through effective resource use (VC) (Abdel-Kader, 2006).

Although these stages and different techniques associated to them have been studied on the bases of environmental changes (Otley, 2016). They could be discussed on the bases of their methodological backgrounds (Roodposhti & Shariati, 2012).

Techniques introduced in stage one are backward looking and are not basically for management. The second stage has a management element in it but it is based on hindsight knowledge and it is more objective in nature. While management accounting as a social knowledge needs to introduce subjective and qualitative elements to reduce bias in decisions made by its tools (Bol and Smith, 2011; Gibbs et al., 2004; Woods, 2012). Stage three considers causal relations by using qualitative elements in its techniques. While stage four takes a foresight approach and consider quantitative and qualitative elements in management accounting techniques.

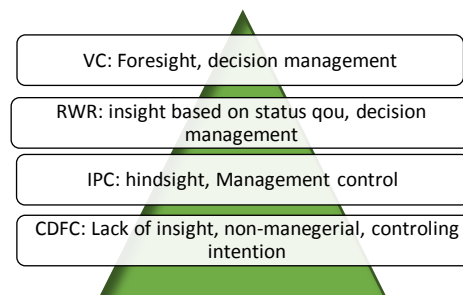


Figure 1: Management accountings position based on management accounting tool

As it has been shown in figure one, management accountants role changes with the technique and tool the introduce to the company. These techniques can take them to the top of the organization beside the top managers (Sorensen, 2009). In order to reach that position one must know management accounting tools nature.

Management accounting knowledge is the knowledge of financial measurement. Therefore, if one wants to study management accounting techniques as an indicator of their knowledge one should consider this fact that management accounting is a social knowledge which is concerned with measurement. Measurement does not necessarily mean associating events with numbers, but it deals with giving information about them (Mari, 2007). It is not the assignment of numbers, but the adequacy and

appropriateness of the measurement system that makes an evaluation a measurement (Micheli, & Mari, 2014). Prior researchers have stated, putting extreme emphasis on the presumed inherent objectivity of management accounting numbers in order to obtain reliable information often leads to little consideration of subjective and qualitative indicators. Management accountants who are not critical and creative thinkers could give the company unqualified and inadequate information systems (Dossi and Patelli, 2010). Therefore, in this study management accounting decision making skills is based on the techniques they choose. The effect of metacognition on management accountants tool of choice is studied in this research. Management accountants' decision based on their academic and practical knowledge may differ. Therefore, two hypotheses have been made based on this situation:

H1: Metacognition has effect on management accountants' decision making belief (what it is)

H2: Metacognition has effect on management accountants' decision making in practice (what it should be)

2.3. Suggested model

The suggested model is based on Schraw and Dennison's (1994) model for the metacognition construct. The decision making construct was made by the researcher, Shariati, and its validity was checked by professionals in the field and also factor analysis showed it was a one factor construct. All questions of the decision making questionnaire had factor loadings higher than 0/5. Therefore, the suggested model is shown below:

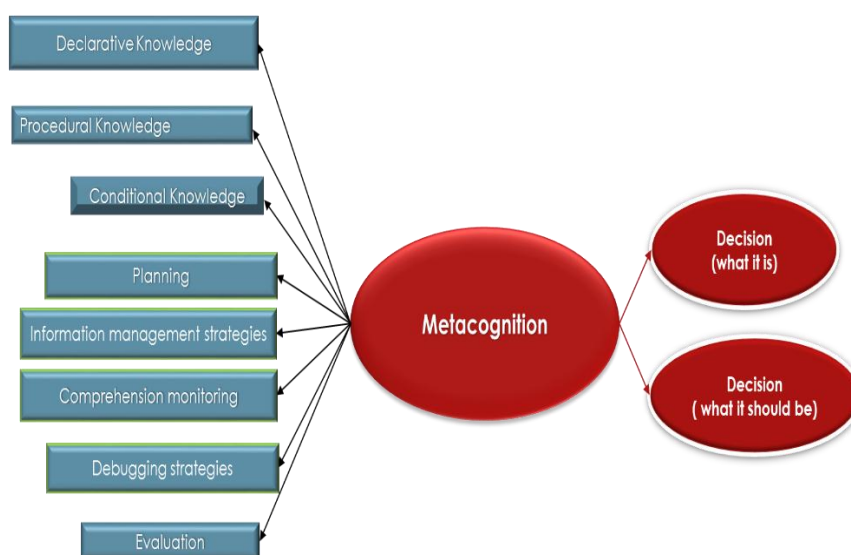


Chart1: Suggested model

3. Methodology

This study has been conducted using three descriptive tools (questionnaires) to find the correlation between metacognition and Decision (What it is). And also the correlation between metacognition and Decision (what it should be).

3.1. Research Design

The study used mixed-methods, in which quantitative and qualitative data were collected in

parallel to answer the same research questions but with complimentary effects. We used the concurrent transformative mixed method study which involves the collection of both quantitative and qualitative data in a single study in which the data are collected concurrently and it involves the integration of the qualitative data at one stage in the research process.

The study consists of three questionnaires. one standard inventory which had been modified with regard to the study's need and feasibility and two semi-

open questionnaires which contained open questions to explore the participants' beliefs and opinions. For the standard inventories factor analyses was conducted to discover the latent variables shaping the thought process of the participants about the concepts in question.

3.2. Participants

Participants were drawn from Islamic Azad Universities of Tehran. Graduate students (N=107) Who enrolled in spring courses of 2017 were asked to participate in the study. Participation was voluntary but encouraged and responses were anonymous and confidential. The actual sample consisted of 83 graduate students. The sample was made up of 39% females and 59.8% males. (1.2% didn't answer this question). So gender was not distributed equally in our sample. Also it is worth mentioning that 69.5% of the respondents were practitioners in the financial field. Only 8.5% percent of the respondents had no professional experience at all.

Since we wanted students who were aware of all the techniques in the management accounting field we decided to conduct our study on the basis of graduate student sample. However, we did ask if they are working in the financial field and we used two questionnaires for decision making. By doing so our findings show what their belief is about the suitable decision and also it shows what they do if a real case is in order. Overall, we collected 88 completed questionnaires. five questionnaires had to be discarded due to a large number of missing values, which resulted in 83 valid questionnaires. students participated (two students did not indicate their gender).

3.3. Instruments

Data was gathered using one standard questionnaires which were modified for research feasibility and two semi-open questionnaires. Participants metacognition awareness, self-leadership and connotative meaning was measured using modified standard instruments which will be introduced and discussed in the following sections.

Two semi-open questionnaires were used to collect quantitative and qualitative data on management accountants' decision making.

3.4. Metacognitive awareness questionnaire

To determine the participants' metacognitive awareness, metacognitive awareness inventory was modified. The test had 52 items developed by Schraw and Dennison (1994). This inventory categorizes concepts in to eight categories named: 1. Declarative Knowledge, 2. Procedural Knowledge 3. Conditional Knowledge, 4. Planning, 5. Information management strategies, 6. Comprehension Monitoring, 7. Debugging strategies & 8. Evaluation

It was reduced to 28 (four question for each category except for category 6 & 7 which two questions for each of these categories was retained) items considering the eight categories due to the feasibility of conducting the survey. Factor analysis was performed for the eight categories. Categories which had more than 0/5 factor loading were retained. Each category was scored on a scale of 0 to 4 points, with all the questions requiring True/False answers. As mentioned earlier confirmatory factor analysis was conducted to discover the validity of the test. The questionnaire used for measuring metacognitive awareness is shown in table 1 in the appendix section.

3.5. Management Accountants' Decision Making Questionnaires

Management Accountants' Decision Making Questionnaires are two 7-item semi-open questionnaires with multiple choice answers. The two questionnaires have same questions and multiple choices. The first one asks about the participants' belief about the right choice. The second questionnaire asks the participants practical choice. The fifth choice of each question is open-ended. Leaving the participants to share her/his belief and thought on the answer of the question. Management accountants' decision making questionnaires are shown in table 2 in the appendix section.

Qualitative data were coded using a combination of theoretical and open coding techniques, then categorized and reported thematically. The open coding process was done using the participants' own terms and researcher's interpretation of the meaning of participants' comments or ideas. Researchers coded the open-ended questions 1 to 4. This numbers were given on the base of the category of participants comments. If the answer was not valid for any category, it would be valued 0. If the answer was all of

the above answers it would be valued 4 since management accounting literature states with technique development the past technique was still reserved (Abdel-Kader, 2006).

4. Results

4.1. Results of factor analysis for metacognition

As we know in PLS software, Path analysis and factor analysis are conducted simultaneously. The results of factor analysis for metacognition are shown in the table below.

Table 3: factor analysis for metacognition

Variable	Factor	Factor loading	T-Value
Metacognition	Declarative Knowledge	0/589*	2/127
	Procedural Knowledge	0/528*	2/290
	Conditional Knowledge	Under 0/5	-**
	Planning	Under 0/5	-
	Information Management Strategies	Under 0/5	-
	Comprehension Monitoring	0/708*	5/221
	Debugging Strategies	Under 0/5	-
	Evaluation	0/599*	2/492

* T value higher than 1/965

** These factors are not considered in the model

As we can see the results show that declarative knowledge, procedural knowledge, comprehension monitoring and evaluation are valid factors for the metacognition construct in Islamic Azad university graduate management accounting students. These factors load higher than 0.5 and their t score is above 1.965.

4.2. Results of factor analysis for decision making

An Exploratory factor analysis was conducted for decision making in SPSS software. The results are shown below.

According to the results all the questions loaded higher than 0/5 and only one factor was extracted.

According to confirmatory factor analysis, all the questions load higher than 0/5 on the one factor of decision making (what it should be).

Table 4: Factor analysis for decision making (what it is)

Variable	Factor	Factor loading
Decision making (what it is)	Question 1	0/589
	Question 2	0/543
	Question 3	0/78
	Question 4	0/627
	Question 5	0/51
	Question 6	0/597
	Question 7	0/655

Table 5: Factor analysis for decision making (what it should be)

Variable	Factor	Factor loading
Decision making (what it should be)	Question 1	0/523
	Question 2	0/741
	Question 3	0/806
	Question 4	0/818
	Question 5	0/842
	Question 6	0/773
	Question 7	0/862

4.3. Results of path analysis

Path analysis was conducted in PLS software. The results are shown in the table below.

Table 6: Path analysis

Variables	Decision (what it is)	Decision (what it should be)
Metacognition	-0/188*	-0/217*

*: t-statistic>1.96

Decision (what it is): Decision in practice

Decision (what it should be): Decision in belief

The results of path analysis show that Metacognition has a negative effect on decision in practice and decision in belief. That is, the correlation between metacognition and decision (what it is) is negative with the amount of 0/188. The correlation between metacognition and decision (what it should be) is negative with the amount of 0/217.

Table 6: R square

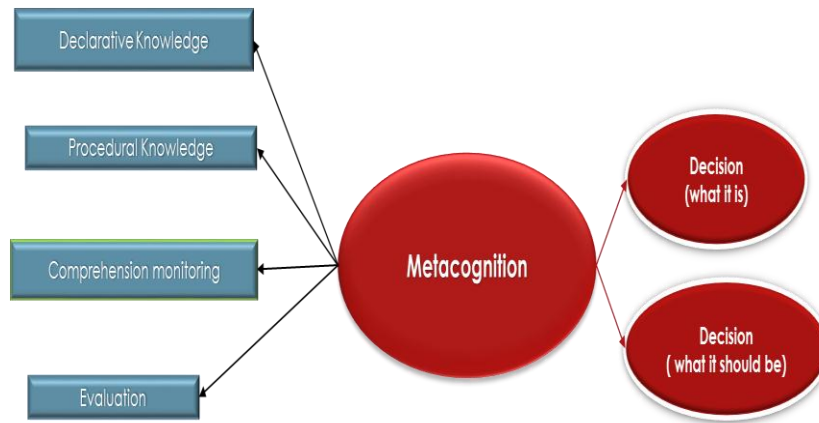
Variables	Decision (what it is)	Decision (what it should be)
Metacognition	0.035	0/047

Results of R square shows that 0.035 of decision (what it is) and 0/047 of decision (what it should be) is explained by metacognition.

The model is shown in the chart below.

Composite reliability for all variables is bigger than 0/7 and average variance extracted for all variables is

above 0/5 except for metacognition that is 0/372. Bootstrapping was conducted to test factor loadings significance. T-statistic for all the factor loadings of excepted factors with above 0/5 loading was above 1.965.



5. Discussion and Conclusions

Results of this study showed Metacognition is effective on management accountants decision making but not in the direction it was expected. Metacognition has a negative effect on management accountants' decision making belief (what it should be) and it also has a negative effect on management accountants' decision making in practice (what it is). The coefficients were all significant for the both paths. Students that obtained the higher score in metacognitive awareness did not choose foresight techniques which require more qualitative elements and innovation. Instead they preferred hindsight techniques, which gave them a more controlling advantage. This might be the effect of self-regulation element of metacognition. Meaning that management accountants high in metacognition awareness alone would not make innovative decisions and are bound to logical thinking. On the other hand, our study took place in an underdeveloped and low privatized country with centralized management. As we can see management accountants in these countries do not introduce innovative management accounting tools in the business. As if they do not see themselves to have an opportunity, as the manager of the company.

Our study makes a significant contribution to management accounting behavior literature. To our knowledge, this is the first research that has studied the effect of metacognition on management accountants' decision in an underdeveloped country.

However, this study has its limitations. Different constructs could be used to measure individuals' minds. In this study we used Schraw and Dennison (1994) inventory for measuring metacognition and management accounting decision questionnaires were designed by the author. Furthermore, participants of our study were graduate students of Islamic Azad university. Since Iran is a low privatized country finding management accountants was not possible for our research and it was not for the lack of trying. In order to give true data, students that had studied management accounting in their courses were used in our sample. It is worth mentioning that above sixty percent of them were employed in financial sections. Using two questionnaires gave us the advantage of knowing how management accounting knowledge regulating affects their belief about this knowledge. And also by studying their decision in practice, they could give us the answer of what they would do in real situations. This gives us as researchers the benefit to have two different types of data. Nevertheless,

repeating this study with practitioners would give us insight of their metacognitive skills and decisions. we suggest replicating this study in developed countries, other countries with different cultural backgrounds and also migrated employees from underdeveloped countries to developed countries, if possible.

Although past research has shown possessing the ability to learn, control and monitor your learning is an important factor for better performance in different domains. Metacognition has a negative effect on management accountants' decision making. Meaning that in order for management accountants to survive and thrive in an ever-changing world we could not merely rely on their learning abilities. Companies need decision-makers who understand the problem and act on it. Overall we conclude that Metacognitive awareness could change management accountants in to competence decision makers for the company.

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