



## Explaining the Role of Management Accounting Information System in Strategy Formulation with Actors Network Approach

**Nemat Rostami Mazouei**

PhD Candidate of Accounting, Islamic Azad University, Sciences and Research Branch, Tehran, Iran

**Fereydoun Rahnamay Roodposhti**

Professor, Islamic Azad University, Sciences and Research Branch, Tehran, Iran  
(Corresponding author)  
rahnama.roodposhti@gmail.com

**Seyed Mohammadreza Raeiszadeh**

Assistant Professor, Islamic Azad University, Noor Branch, Iran

**Bahman Banimahd**

Associate Professor, Islamic Azad University, Karaj Branch, Iran

**Zahra Poorzamani**

Associate Professor, Islamic Azad University, Central Branch, Tehran, Iran

### ABSTRACT

The real challenge of business environment is derived from a situation where organizations need to find opportunities on how to introduce ideas and new products to market that provide future earnings stream. Management accounting is used as a tool in this process and provides information on opportunities and threats.

The purpose of this research is to explain the role of management accounting information system in the process of strategy formulation with actors' network theory approach. Actor network theory is a valuable approach to improve understanding the power of each actors in management accounting system in the process of strategy formulation and helps to increase our understanding of the actors, intermediaries hidden in it and how they interact in making the network.

This research is a descriptive correlational study and its required data have been collected through a questionnaire conducted among 400 financial managers of commercial companies at Tehran in 2017 and the hypotheses testing was performed using non-parametric binomial test. The results obtained show that actors in management accounting system play a key role in the process of formulating organizational strategy. This result suggests that the actors are regarded as interventionists able to influence and change strategic decisions in actor approach contrary to the traditional approach where management accountants are simply considered a scorer or historian.

### Keywords:

Accounting Information System, Management Accounting, Strategy, Actor-Network Theory



## 1. Introduction

In a dynamic environment, organizations must be synchronized with details and eminent pressures; this includes technological change, globalization, and customer demand, which made information with effective characteristics a required option for surviving and continuing operation in such environments (Rahnamaye Roodposhti, 2008). The competitive environment demands that companies create value for their customers and by developing a specific business strategy differentiate themselves from their competitors (Simons, 1987).

This principal is based on the argument that with an increase in the ambiguous environment, administrators need a particular form of accounting information to support their own decisions, which can assist them to monitor their own progress in response to the strategy. The role of management accounting system is to provide updated information and to help managers in achieving informed economic decisions and motivating users to make a change in the organization. Inability in reliance on appropriate accounting information contributes to the inefficient management of resources and leads to a gradual decline in organizational performance. These factors have led to revision in organizational strategies of companies (Horngren, 1995).

There is little research conducted about strategic planning based on management accounting information, however, despite few studied conducted, results suggest a positive association between the use of management accounting information and strategy (Hateen & Hatten, 1997). Schwenk (1995), emphasized the need to investigate the role of management accounting information in the strategy formulation process, while O'Regan and Ghobadian (2002) have argued that the lack of relevance and adequacy of information is a major obstacle to the formulation of a formal strategy. In this field, Rogers and Bamford (2002) have argued that the strategy formulation should focus on the types of information supporting the company's strategic direction.

According to Steiner (1979), the strategy formulation requires continuous coordination of broader output from other processes in every organization. Similarly, Frezatti et al (2011) referred that none of the processes in the organization need information as much as strategy formulation process does. Papazov and Mihaylova (2010) suggested that

the strategy formulation should be based on the accurate and timely information. The need for accounting information for the purpose of strategy formulation has even been emphasized by critics such as Mintzberg (1994).

Shank and Govindarajan (1993) showed that accounting plays an important role in facilitating the development of business strategy. They noted that accounting information shapes basis of financial analysis through identification of possible strategies. Bhimani and Keshtvarz (1999) argued that senior accountants have an important responsibility in providing information for strategy formulation and its implementation within the organization.

The important issue is that whether accounting tools represent an active relationship between strategy and external economic conditions of a company or not. Skaerbaek and Tryggestad (2010) postulated that several accounting tools together can play an active role in formulating a strategy. Kreiner and Mouritsen (2003) showed that accounting tools can play an important role in relation to the external environment. Both studies emphasized the role of active strategic management accounting tools in the adoption of a business strategy.

According to Rogers and Bamford (2002) required information of the organization with the approach of strategy formulation process is connected to the environment and the structure of the company. Bhymany and Langfield-smith (2007) have shown that the interaction between strategy and management accounting information being used is affected by different factors or organizational environment. Ward (1993) showed that the plans of a thoughtful strategy formulation processes require extensive input information from the management accounting.

The starting point has been that traditional methods such as contingency approach do not effectively analyze or cover the complex nature of strategic changes. Regarding the static nature and cause and effect connection, Chow (1999) cited that an alternative to traditional research can potentially enrich our understanding of the accounting in practice and extend it. Roslender and Hart (2003) have claimed that the failure of accounting information improve organizational strategic process is associated with traditional management accounting practices, while Hiromoto (1991) noted that the traditional management accounting lacks the ability to provide

the necessary information for managers' for organizational competition and performance; thus, according to the space-time coordination, definition of management accounting should be considered to make it possible and facilitate that definition of management accounting has been proposed as a "technology" (Pipan and Czarniawska, 2010). Technology in its modern definition is a set of the technical implements, informational, humanistic and organizational, coherent set of a network of humane and artificial actors. Based on the actor-network theory, management accounting is an actor in its interaction with other actors in interconnected networks of individuals, organizations, and markets which can cause a change in other actors, and creative performance can be an arena for infiltration and intervention (Rahnamy Roodposhti and Nejad Touleми, 2016).

In the current study, management accounting information systems act as actors that force the other actors in the network to act in order to change the current state of affairs, and to affect the actions and perception of human actors. They can be a black-box (strategies) which show the "whole" that many actors have shaped. In this "whole" many elements function together to achieve a common goal. The central actors in this descriptive study are management accounting and strategy. Management accounting actors are divided into two main categories: management accounting technology (e.g., management accounting information system and management accounting inscription) and human actors. The present research uses the actor network theory as a theoretical viewpoint in analyzing a research subject.

According to the previously discussed topics, the main goal of this study is to explain the relationship between management accounting and strategy, along with its conceptual model formulation based on the approach of actors-network theory. This subject as a scientific achievement can expand the theoretical foundations of management accounting texts, strategy, and actors-network theory, and by introducing a new sociological approach of management accounting actors and communication among them provide useful information for managers for the perception and recognition of the factors affecting strategy formulation process and also provide new ideas for future research.

## **2. Literature Review**

According to Seal (2001), the management accounting information system has been shown and presented as a distinctive system. From a commercial policy perspective, system differentiation can be the basis of a successful competitive strategy. A management accounting system that fits and is appropriate to support the strategy can lead to competitive advantages and extraordinary performance (Langfield-Smith, 1997). Many researches have suggested that the congruent adjustment between strategy and management accounting system is essential for performance (Govindarajan & Gupta, 1985; Simons, 1987). This argument has been supported by Kaplan and Norton (1996). They suggested that a proper performance measurement system is the incentive of the actions which are consistent with the organization's strategy; therefore, it can be concluded that strategy is an important factor in designing and utilizing a management accounting system. This conclusion is in line with the Simons (1987) proposal, in which the management accounting system is modified according to its modification to company's strategy. Nevertheless, newer perspectives show that there may be a two-way relationship between these two variables, in which the management accounting system both forms and is formed by the strategy (Kober et al, 2007).

By reviewing the literature, it can be said that most of the studies usually had a normative approach toward formulating strategies while using the terms strategic planning or strategy formulation. Hopwood (1990) calls for a new method for analyzing accounting and more advanced viewpoints for the organization's dynamism, which shapes and modifies accounting changes. He reminds that current developments in manufacturing technology describe the observed procedures in accounting. The main streams of research conducted in the field of management accounting and strategy mainly contribute to the literature of contingency theory.

The alternative views in the articles by Baxter and Chua (2003) and Chua (2004) are studies about the theory of actors-network theory. That the actors-network theory has been borrowed from other disciplines reflects the challenges associated with its features as a research strategy. The fact is that actors-network theory is an appropriate theory for the research in organizational thought and practice.

Management accounting acts as a group of actors which can be both human and artificial. Many descriptions about actors have been presented (Latour, 2005, Callon & Law, 1986), and these definitions are contradictory to an extent. The definition of actors in this study is based on Latour's (1997-2005) definition. According to Latour (1997), an actor is something that performs an action, or it is an agent for performing the action by another one. An actor can be anything that its provider of the so called source of an action. What modifies a situation by creating a difference is an actor and, if it is not already configured, it is called an agent (Latour, 2005). Various configurations can be given to the similar agents.

A similar review in management accounting studies (e.g., Dechow & Mouritsen, 2005) indicates that management accounting technology, such as information technology, has been viewed as an actor. An actor can be a human, like a controller. Management accounting actors, such as accounting information technology, fit into the formulation and structure of the organization activities. There are prominent examples of artificial actors which Latour referred to (Justesen & Mouritsen, 2011).

As it has been stated, management accounting actors have been divided into two main categories: management accounting technology (e.g., management accounting information system and management accounting system) and human actors. Artificial actors are the accounting technologies (Latour, 1997). In this study, artificial actors include two actors: management accounting information system and management accounting inscription. The inscriptions refer to the translation (interpretation) of the basic texts of each environment and contexts. Tables and charts, facts and figures, lists, etc. ..., are what operations are performed accordingly. In this study, management accounting inscription are divided into four groups: reporting, budgeting, forecasts, investment and production calculations. Human actors are the main people in the financial sector, but it also includes other people who perform different computing in the organization and participate in strategic decision making negotiations.

Strategies as an actor can be identified in relation to many sectors. This type of actor is a major actor in the theory of network actors. The strategy is also supposed to be a temporary achievement, which means that there is a permanent motion exists between and

inside the related sectors. This study accepted the view in which the strategy is considered as a black-box. According to Latour (1997), the black-box is a whole, in which several elements co-operate. The strategy is some kind of black-box, which is an accumulative part of organization's basic principles.

The theory of network actors is a valuable lens to improve the perception of the power of each management accounting actor in the process of formulating a strategy, which provides useful theoretical concepts for the fields of management accounting; and thus provide a better perception of management accounting, especially during chaotic economic times. In this research, technologies have been investigated as the accounting technology and divided into two groups of management accounting inscription and management accounting system. A summary of previous studies conducted in Iran and abroad are presented as follow:

Simons (1987) examined the accounting control systems and business strategy. His study has examined the hypothesis that control systems should be modified according to company's business strategy, by testing the differences of accounting control systems characteristics between the two groups of companies which follow the differentiation strategy. Results and evidence showed that there is a relationship between business strategy control systems and company's performance.

Nevries and Weide (2006) in a research about the characteristics of the strategic planning process and the relevance of management accounting: they have investigated evidence from German, DAX30 companies. The goal of this study is to analyze the subject that how is the support, partnership and influence of management accountants and how is their process in the strategic planning. The findings indicate that accounting management plays a major role in the strategy process.

Alcouffe et al. (2008) in a research entitled Actor-Networks and the Diffusion of Management Accounting Innovations; a comparative study examined management accounting innovation as a process of constructing and interpreting actors-network. Their goal was to better understand the nature of accounting changes and using the theory of actors-network to examine the fate of innovations in the processes. This innovation included activity-based costing. They show how the problematization process,

Interessement, Enrollment, and mobilization as well, happen repeatedly and aiming to diffuse the innovation.

Hejazi and Fotouhi (2009) in a research investigated the relationship between organization's competitive strategy, organizational design and management accounting system with organizational performance; the contingency proportionality approach in chemical and pharmaceutical as well as motorcycles and vehicles industries. The results indicated that there is a significant relationship exists between competitive strategy, organizational design and management accounting and performance with contingency proportionality approach in all the investigated companies in the intended industries.

Cinquini and Tenucci (2010) in a study titled *Strategic Management Accounting and Business Strategy: A Loose Coupling?* explored whether business strategy affects the use of strategic management accounting. Research finding suggests that several strategic management accounting techniques, such as other countries, are used in Italy. Customer accounting, monitoring the competitive situation, rivals' performance evaluation based on published financial statements and quality costing, represent Italian extensive use of instances of strategic management accounting techniques. By using regression analysis, both companies with defensive strategy and companies with cost leadership strategies have a tendency to use strategic management accounting techniques to address their full cost information; and strategic management accounting techniques have the potency to support companies' different strategic approaches.

Justesen and Mouritsen (2011) in an article entitled *The Effects of the Network's Theory in accounting research*, Operators to examine Bruno Latour Actors Network's theory on accounting research and how their writings have unknown potential which can inspire future research. This article, which has been conducted on critical and reviewing approach, concludes that the theory of actors-network, particularly the work of Bruno Latour, inspired the accounting researchers and led to novel studies of accounting phenomena, this means that there is an unknown potential in the recent writing of Latour that can lead to the formation of accounting research.

Cuganesana et al. (2012) in a research titled *Strategic Management Accounting and Strategy*

*Practices within a Public Sector Agency*, investigated the role of management accounting in organizational methods in a way that the strategy is adopted-through a longitudinal study of a public sector. This research identifies roles for management accounting in strategy development which goes beyond the tasks of facilitating and influencing decision making. Research findings revealed that management accounting methods can be used particularly by the strategies of the public sector units and it is the opposite position of the orientations of the strategic accounting is accounting research which governs the private sector.

Mousa Shiri and Shakeri (2014) conducted a research paper titled *strategy, Strategic Management Accounting, and the Performance in the Companies Listed by Tehran Stock Exchange* with the aim of assessing whether the conformity of strategic management accounting and strategy improves performance or not, and also what is the impact of strategic management accounting and strategy on performance. The result of the research revealed that Prospector strategy and costing techniques (a series of strategic management accounting techniques) improve the performance, and also conformity of strategic management accounting and strategy improves performance.

Emil Papazova and Lyudmila Mihaylova (2015) in a research entitled *Organizational Information Management in the Field of Company Strategy*, with the aim of investigating the relationship between strategic decisions and cost management, and by emphasizing the role of accountability for the implementation of strategies and the provision of operational solutions for medium and small sized enterprises in the Bulgaria. Analyzing and combining descriptive statics and comparative and case study method have been used in order to achieve these goals. The study results and findings indicated that the use of accountability information can justify a change in strategic goals or plans. This means that the reporting system must be evaluated according to its effects on the success of a company in relation to the realization of the goals of an organization.

Ghasemi et al. (2015) examined the relationship between strategy, competition, management accounting system and organizational performance. The research data have been collected from managers and financial supervisors of 120 companies and have been analyzed through structural equations modeling

of partial least squares. Research findings illustrate that Changes and competition directly improve performance, and indirectly change in the information management accounting system and strategy, and also a change in strategy leads to a better organizational performance through a change in the management accounting system.

Bani Talebi, Rahnamaye Roodposhti, et al. (2015), in a research titled the theory of network actor explanation in accounting from knowledge perspective, introduce and explain, network actors' theory, the forming components of each network and the way in which this theory and its components are in the accounting system from knowledge perspective. According to the results of the research, the theory of network actors is capable of exploring and explaining effective human and artificial actors as well as their communication and interaction in the network of actors from sociology perspective, so that in any accounting system, based on this theory, the existing networks of all the effective actors in each network and their role, the type of act, the black box and the performed action can be identified.

Englund et al. (2016) in a case study entitled Structuring Theory of Perspective on Strategic and Accounting Interaction: Reopening of change and social sustainability, explore how structural theory can be used to analyze the interaction between strategy and accounting in the everyday existence of the organization. They concluded that strategy and accounting should not be considered separately, but should be viewed as two aspects of an action each of which feeds the other over time, and are interfaced. Accordingly, they outlined how structural theory can be used to understand the continuous transformation of organizational methods. As a result, a structural theory not only provides a strong ontology framework for theorizing these methods, but it can also be used as a rich conceptual toolbox to better perceive the nature and why of structural continuity and it changes in everyday organizational life.

Rahnamay Roodposhti and NejadToolemi (2016) in a research entitled Ontology (performing, network actor and applications actor), studied the scientific philosophy on the subject of management accounting ontology and concluded that management accounting forms in the intelligent network process and the essential role of virtual and non-positional elements of

“power and ideology” could not be ignored in the real networks.

Burga and Rezania (2017) in a research entitled Project Responsiveness, Expletory Case Study Using Actors-Network theory, by using the notion of accountability and actors-network theory for collecting data and analyzing they utilized a graphical scheme of communication network activation in three parts of the project, and found out that artificial actors play an important role in transferring responsiveness through disclosure of information. They also found that project responsiveness was distributed between the sectors at the initial stage of the work process and it was transferred through the approval process of the actor and ultimately reconstructed through the completion of the project objectives. In addition, accountability turns to be obligatory without being already planned.

Collins et al. (2017) in a research entitled Strategic Management Accounting and Decision Making: A Survey of the Nigerian Banks empirically investigated the adoption of strategic management accounting methods in the banks of mentioned country. They examined the degree of performance and strategic management accounting system assistance to strategic decisions. They conclude by using a survey from 71 bank executives that strategic management accounting is distant from management accounting function in its features and approaches. Additionally, using methods of a strategic management accounting system by banks is not only a concept, but a part of their core operations and it contributes to their significant strategic decisions, including competitive advantages and market share and suggests it for the development of bank economy.

The following diagram illustrates the overall conceptual framework of the research theoretical framework.

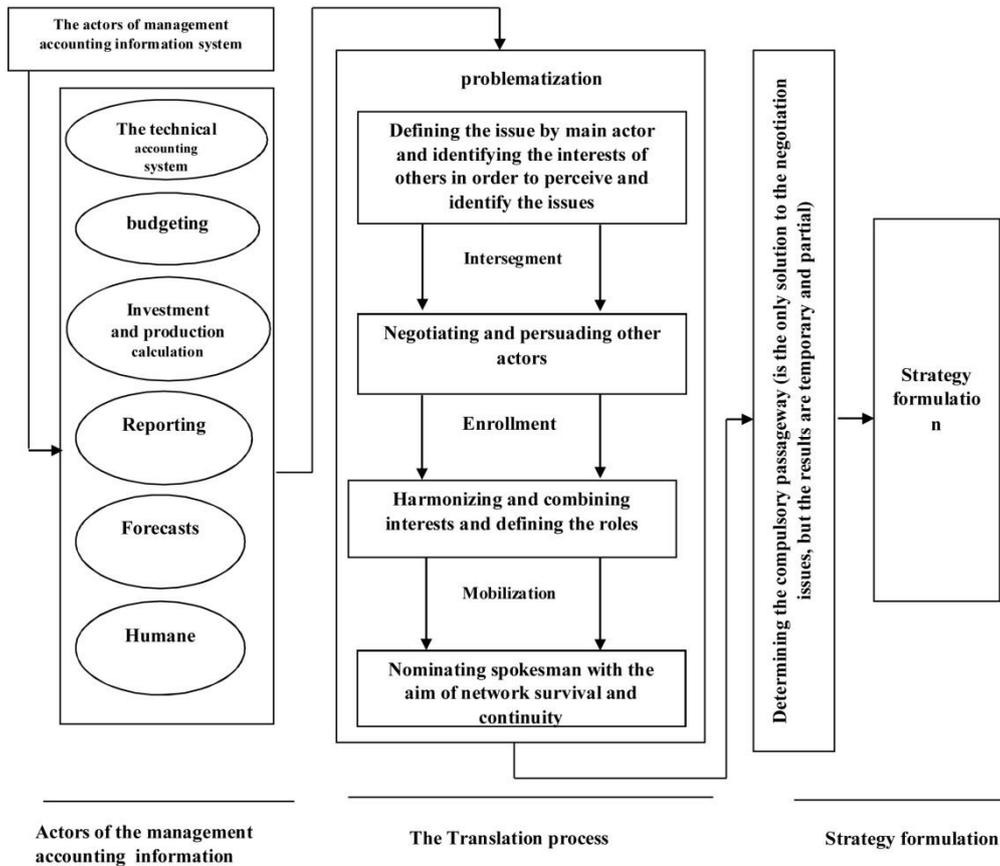


chart 1: the conceptual framework for research (source: the researcher).

Based on a conceptual model, the research hypotheses are formulated as follows:

- 1) The technical function of the management accounting information system affects the process of formulating the organizational strategy according to the Translation process.
- 2) The function of budgeting in management accounting information system affects the process of formulating the organizational strategy according to the Translation process.
- 3) The calculation of investment and production of the management accounting information has an impact on the process of formulating the organizational strategy according to the Translation process.
- 4) Reporting of the management accounting information system affects the process of formulating the organizational strategy according to the Translation process.
- 5) The human actors of management accounting information system have an impact on the process of formulating the organizational strategy according to the Translation process.
- 6) The Forecasts of the management accounting information system has an impact on the process of formulating the organizational strategy according to the Translation process.

### 3. Methodology

The current research methodology is correctional descriptive and is practical in its purpose. Since the questionnaire has been used, it is considered as a survey type. Survey study is a method for collecting data, in which certain groups of people are asked to answer a certain number of specific questions. This

method is one of the most commonly used methods in the social studies (Baker, 2006). In the present research, regarding the theoretical framework and related literature, a 7-point Likert scale questionnaire with 65 questions has been developed to test 6 hypotheses. In this questionnaire, the role of actors of management accounting information system based on theoretical foundations include variables such as technical actors, budgeting, investment and production, reporting, human and management accounting system forecast about the role and influence of each actor in the management accounting information system on the process of formulating an organizational strategy have been questioned.

The statistical population of the study consists of financial managers at Tehran city. The intended individuals in the research must have at least a bachelor's degree and have work or research experience in management, accounting, and management accounting.

According to what mentioned above, the statistical population is about 3500 individuals that according to the Krejcie and Morgan's table, considering the minimum sample size and using the Cochran formula presented in the following, 424 questionnaires were completed, that 24 of which were excluded due to defects and failure to answer all the questions and 400 questionnaires has been used for the final evaluation.

$$n_0 = \frac{z_{\alpha/2}^2 pq}{d^2}$$

### 3.1. Validity and Reliability of the questionnaire

Before final assurance toward the measurement instrument and its application in the main phase of data collection, it is necessary for the researcher to obtain a relative certainty as to the reliability of the use of the instrument through scientific way (Banimahd et al., 2016). In the following, validity and reliability of the questionnaire have been reviewed.

Lawshe (1975) devised a useful way for evaluating content validity. This method measures the degree of agreement between evaluators or judges on the suitability or fundamentality of a particular item which can be calculated through following formula (Hafez Nia, 2006):

$$CVR = \frac{ne - \frac{N}{2}}{\frac{N}{2}}$$

In the above formula, we have the following: CVR= Content Validity Ratio, the ne= number of evaluators or arbitrators who consider the item as essential or beneficial. N= total number of assessors or judges.

In this study, to ensure the content validity, 8 of professors and experts were questioned about the items and the content validity ratio of the variables was calculated. It is necessary for 8 evaluators or judges that the average of the minimum ratio of the content validity to be 0.75. According to the calculated coefficient through Lawshe method, the questions which have obtained the minimum required coefficient of (%75) have been used as the item in the final questionnaire. Also, factor load coefficients related to the questionnaire were likewise used to determine the construct validity by using AMOS software which showed value of 0.31 for all the questions.

Cronbach alpha coefficient has been used to determine the reliability. In fact, we want to find out how similar the respondents have taken the same questions. Cronbach's alpha of 0.965 has been acquired for 65 questions of the questionnaire, which indicates that the questionnaire has an acceptable reliability and it shows the reliability of the questionnaire.

## 4. Results

In the analysis of the data, the Kolmogorov-Smirnov test was first used for the normalization of the research data. The results of the above test according to Table 1 indicate that the data are not normal, so for the deduction of the hypotheses a binominal non-parametric test has been utilized. Also, because of using the 7-point Likert scale in the questionnaire, the number 4 based on the error level of 0.05 was considered as the middle or recusant number, which is the base for the rejection or acceptance of the hypotheses.

**Table 1: Results of the Kolmogorov-Smirnov test for variables**

The actor of management accounting information system	technical	budgeting	Investment and production calculation	Reporting	Humane	Forecasts
Klomogorov-Smirnov z	1.848	1.808	1.652	1.852	2.810	1.669
Asymp.Sig(2-tailed)	0.0002	0.0003	0.0009	0.0002	0.0001	0.0008

Based on the results of Table 1, the significance level of the variables is less than 0.05, and it shows that the intended variables do not follow a normal distribution, so the binominal non-parametric test is utilized to test the hypotheses.

$$H_0: \mu \leq 4$$

$$H_1: \mu > 4$$

If the significance level is less than 0.05, then the variable under investigation with the test value of 4, has a significant difference. In this situation, if the mean of the factor under consideration was greater than 4, then the factor was considered to exist in the statistical population. The summary of the results of the research hypotheses is presented in Table 2.

**Table 2: Test Results of Research Hypotheses (actors of the Management Accounting System)**

Mean	Exact Sig(2 tailed)	Test Pro	Observed Pro	N	Categories	Actors	
Theoretical	4	0.0001	50%	0.03	13	≤4	technical
Calculated	5.1488	-	-	0.97	387	>4	
-	-	-	-	1.00	400	-	
Theoretical	4	0.0001	50%	0.45	18	≤4	budgeting
Calculated	5.0833	-	-	0.955	382	>4	
-	-	-	-	1.00	400	-	
Theoretical	4	0.0001	50%	0.035	14	≤4	Investment and production calculation
Calculated	5.1903	-	-	0.965	386	>4	
-	-	-	-	1.00	400	-	
Theoretical	4	0.0001	50%	0.16	63	≤4	Reporting
Calculated	5.0442	-	-	0.84	337	>4	
-	-	-	-	1.00	400	-	
Theoretical	4	0.0001	50%	0.03	11	≤4	Forecasts
Calculated	5.0788	-	-	0.97	389	>4	
-	-	-	-	1.00	400	-	
Theoretical	4	0.0001	50%	0.15	60	≤4	Humane
Calculated	4.8531	-	-	0.85	340	>4	
-	-	-	-	1.00	400	-	

Source: Researcher Findings

The results of Table 2 indicate that the significance level of binominal test for the assumption of  $H_0$  for the hypotheses  $\mu \leq 4$  versus  $\mu > 4$ , for all hypotheses related to technical actors, budgeting, investment and production calculation, reporting, human, and Forecasts of management accounting system information equal 0.0001. Therefore, at the confidence level of 0.95, statics assumptions in all 6 hypotheses are rejected and the opposite hypotheses are verified, that is, from the respondents' point of view and based on the results of the hypotheses it can be claimed that:

- 1) By accepting the first hypothesis of the study, it is concluded that technical actors act as actors that force the other actors in the network to act in order to change the current state of affairs. This supports the point that the development of information technology system could allow more focus on the development of management accounting and allow concentration on supporter role in strategy formulation and gives more insight to the managers for strategic and long-term decision

making with various reports and analyses with added values.

- 2) Based on the result of the second hypothesis of the research, it is concluded that the budgets are in multiple links with other actors in management accounting network (monthly reporting and controllers) and various units (such as production). Therefore, it can be said that by applying the concept of an active network, one can better look at the multifaceted nature of the relationship actors in their place. Therefore, the budgeting process serves as a means of convincing the potential shareholders about the benefit of the intended system, legitimizes the budgeting activities and gives participants the opportunity to negotiate and it is a powerful actor which contributes to resource control.
- 3) Given the acceptance of the third hypothesis, it can be said that important calculations, like the various and general calculations of raw materials and production have the power of changing the strategic direction of a company. Especially when these calculations are supported by the qualitative information derived from deeper accounting figures. Meanwhile, in investment decision making, qualitative information is necessary at different times, because different people can better perceive the figures or written texts.
- 4) According to the results of the fourth hypothesis, it can be said that management accounting inscription, such as reporting and budgeting, act as a strong mediator in strategy change and from the perspective of actors-network theory, it can be argued that management accounting inscription are known as the communication language of different sectors of the organization, and by depending on the subject matter and specific field, it can provide relevant information and give strength to various components of the organization to engage in the negotiation and create dialogues among different sectors of the organization and help to redefine and reform the relationships.
- 5) By accepting the fifth hypothesis, it seems that the function of management accounting extends beyond the financial unit into a process known as combining, because

management accounting is more directly linked to new organizational units and the analysis within management accounting unit present only a minor image of their role in the organizations, so human actors are seen as interveners who are capable of influencing and changing strategic decisions.

- 6) By accepting the sixth hypothesis, it can be said that the forecasts of the management accounting system make it possible to analyze over time horizons, and this suggests that forecasts acts as an instrumental and mobilizing tool, which is a vector and provider of power and by this they can influence the other actors by interpreting their meaning through the next actor.

## 5. Discussion and Conclusions

This study has been designed and implemented to determine the role of the management accounting information system in formulating the strategy according to actors-network approach. The results confirm the hypotheses, which indicate the importance of the impact of management accounting information in the process of formulating organizational strategies. Therefore, according to the results of the research hypotheses, it can be argued that the centrality of management accounting information system positively affect the quality and efficiency of organizational outputs, human actors' perceptions and the way people work and it is a key element in removing time and space constraints and facilitates better and faster access to information and updates, and it enables accountants to provide an integrated picture of the organization's strategy and financial decisions.

Also, when activity and budget performance are seen within management accounting actors, they have more power to influence strategic direction. Thus, the participants in budgeting find opportunities to try to unite the interests of different actors, as a result, the unification of interests becomes visible through the texts of the budget documents which is called the black box. From this perspective, it can be said that the budget plays an important role in aligning interests and that the budget is not static black box technology, but it can be reopened when the actors-network splits up. The budget can be deployed as an actor capable of developing and mobilizing communication networks with budget users to build power; and in this way the

budget becomes a document for which the holder is responsible for its charge, as well as the function of the budget of the liability centers can be evaluated through deviation reports via accounting technology.

On the other hand, with the acceptance of the third hypothesis, the power of perceiving the accounting calculations within the organizations is highlighted, and the privileged position of management accounting as well as the ability to observe with new methods is provided through the connection between different tasks; texts, even if they make the operation visible and verifiable, do not always provide the correct image of a goal, because one person can calculate figures but may not perceive the purpose that the figures point to. This allows more insights.

Based on the results of the fourth hypothesis, it is argued that basically financial or quantitative reporting in only the figures, but in addition, we must receive written notes that deeply explain the figures. The power associated with specific written notes of management accounting is different, depending on its context and the basis of the figures. In other words, the power of accounting writing (such as reporting) is due to numerous links that shape the accounting phenomenon. By using these concepts, you can estimate the power of accounting notions. On the other hand, the written information is vital for the sharing of knowledge of implicit norms and the frameworks of meaning which can be applied. The qualitative and non-objective information provides information about the field of figures and it indicates that the collectively has the potential to align the strategy. The finding supports Kolehmainen (2012) research. He points that the addition of objective and qualitative elements in management accounting can reinforce its strategic role.

In the analysis of the fifth hypothesis result and according to the theoretical issues of the research, it can be said that human actors are the main people of financial sectors, such as controllers, but this term includes others, such as production managers and administrators who have the power to influence strategic decisions. However, many statistical meaningful calculations are outside of the financial units and prove that management accounting has been diffused in different units. Many intermediaries of humanistic and artificial actors of management accounting are found outside of the financial unit and are calculated by employees outside of the accounting

units; therefore, the controllers act as an actor-network with employees from production, procurement and execution units. This partnership gives the parties different tools to further expand their field of work, which is the result of the effect created by a heterogeneous interactive network.

In order to explain the results of the sixth hypothesis, it should be said that, in general, practical predictions are of particular concern to the users of the information system, which in addition to the necessity to recognize the audience and their need, identifying the goals of the users of accounting information is also a necessary step in strengthening the information and its publishing mechanism; this action in background emphasizes the dynamic dimension of the turbulence of the world and the fact the linear path of prediction is not always possible.

According to the results, the following practical points are proposed to be considered by the managers of the organizations:

- 1) The recognition, deployment and propagation of the generated information by the accounting system that promote interaction and trust between the information producers and users that, in turn, can be effective in developing and implementing a business strategy.
- 2) The budget should be used as a coordination tool and operational roadmap of strategic plans, simplification and commitment reinforcement of managers to the organization's programs, and also as a criterion of performance evaluation and rewarding toward the controlling goals of the organizations.
- 3) In making the strategic, long term and operational, short term decisions, the managers must pay more attention to the calculations extracted from the management accounting system and take advantage of them in the inventory management decisions, acceptance or rejection of the investment projects, pricing, and entrance to the new markets strategies.
- 4) Using management accounting inscription can create dialogues between different sections of the organization and help to the redefinition and modification of the relationships. Its optimized application can help to the development and sharing of knowledge and innovation at organizational level and value creation in business.

- 5) It's suggested that management accounting forecasts like scenario-based analysis be deployed in order to represent the dynamics of company activities through identifying the intra-organizational and extra-organizational beneficiaries' needs.
- 6) One of the most important steps in the process of using strategic management accounting is the special attention to the instructional needs of key personnel like general managers, production managers, marketing and accounting managers that can be expanded to the lower level of the organization to guaranty the development of management accounting duties to provide information for all performance-related channels of the organization. Because, there would be the risk of providing misleading information if the accounting sector not be consistent with the other sectors of the organization.

The research's limitations are as follows:

- 1) Due to the limitations of the social science studies, which are based on survey data, and also factors like organizational structure, organizational technology, organizational culture, and environmental uncertainty that is pertinent to the traditional management accounting practices, the results of this research cannot be generalized to the whole community.
- 2) Prolongation of the research time may affect the accuracy of the respondents and some people have refused to provide real answers.
- 3) This research has been done in a cross-sectional manner, and hence, makes it difficult making conclusion about causality.

Suggestion for future research is as follows:

- 1) It is suggested to researchers by utilizing the structure of the current study; explore the role of other accounting areas such as financial accounting, financial management, or auditing in IT environments using the actors-network approach. Research on the other aspects of accounting and finance, such as capital budgeting, cash management, credit control, asset management and so on, can be another route for research on human and technological interactions.
- 2) The current research has been conducted from the perspective of the actor network, but further

research can be done on other alternative theoretical perspectives such as contingency, institutional, accountability, structure, or agency and behavioral research, such as the theory of planned behavior.

- 3) Since the actors-network theory considers adequate weight for human and technical actors and does not differentiate them, it seems that the application of this theory to research on issues such as BSC, JIT, ERP, environmental accounting, and similar issues, such as corporate social responsibility bring forth interesting results.

## References

- 1) Alcouffe, S. Berland, N. And Levant, Y. (2008). Actor-networks and the diffusion of management accounting innovations: A comparative study. *Management Accounting Research*, 19(1), 1-17.
- 2) Baker, T, L. (2006). *Theoretical Research Method in Social Sciences*, Translated by Hooshang Nayibi, Payame Noor Publications, Tehran
- 3) Banimahd, B, Arabi, M, Hassanpour, Sh., (2016). *Empirical and Methodological Research in Accounting*, Terme Publication. First Edition.
- 4) BaniTalibi D, B; Rahnamaye Roodposhti, F; NikoMaram, H; Talibnia, Q. (2015). Explaining the theory of actors' network in accounting from a knowledge perspective. *Accounting and Management Knowledge*, Winter 1394, Year 4, No 16, 130-119.
- 5) Baxter, J; Chua, W. (2003). Alternative management accounting research- whence and whither, *Accounting, Organisations and Society*, 28 (2-3), 97-126.
- 6) Bhimani, A; Keshtvarz, M. (1999). 'British management accountants: strategically oriented?', *Journal of cost management*, 13(2), pp. 25-31.
- 7) Bhimani, A; Langfield-Smith, K. (2007). 'Structure, formality and the importance of financial and non-financial information in strategy development and implementation', *Management accounting research*, 18(1), pp. 3-31.
- 8) Callon, M; Law J; Rip A. (1986). *Mapping the Dynamics of Science and Technology*, *Sociology of Science in the Real World*, London, Mac Millan.
- 9) Chow, C, W; Shields, M. D. Wu, A. (1999). The importance of national culture in the design of and

- preference for management controls for multi-national operations. *Accounting, Organizations and Society*, 24(5-6), 441-461.
- 10) Chua, W. (2004) Translating social theory – a critical commentary. *Critical Perspectives on Accounting*, 15 (2), 255-260.
  - 11) Collins S., Solabomi O.A. (2017). Strategic management accounting and decision making: A survey of the Nigerian Banks. *Future Business Journal* 13, 119–137.
  - 12) Dechow, N. ; Mouritsen, J. (2005). Enterprise resource planning systems, management control and the quest for integration, *Accounting, Organizations and Society*, 30 (7.8), 691-733.
  - 13) Frezatti, F; Aguiar, A.B; Guerreiro, R; Gouvea, M.A. (2011). Does management accounting play a role in planning process?, *Journal of Business Research*, 64(3), pp. 242-249.
  - 14) Govindarajan, V. - Gupta A. (1985). Linking control systems to business unit strategy: Impact on performance. *Accounting, Organizations and Society*, 10(1), 51-66.
  - 15) Hafez Nia, M. (2006). *Introduction to Research Method in Human Sciences*. Tehran: Samt.
  - 16) Hans E; Jonas G, John B, (2016). A structuration theory perspective on the interplay between strategy and accounting: Unpacking social continuity and transformation, *Critical Perspectives on Accounting*
  - 17) Hatten, M.L; and Hatten, K.J. (1997). 'Information Systems Strategy: Long Overdue – and Still Not Here', *Long Range Planning*, 30(2), pp. 254-266.
  - 18) Hejazi, R; Fotouhi, N, (2009). Investigating the interconnection between the organization's competitive strategy, organizational design, and management accounting system with the performance of the organization: the contingency appropriateness approach in the chemical and pharmaceutical industries and automobile and motorcycles. *Journal of Accounting and Auditing*, ( 1), pp31-59.
  - 19) Hiromoto, T. (1991). 'Restoring the relevance of management accounting', *Journal of Management Accounting Research*, 3, pp. 1-15.
  - 20) Hopwood, A. G. (1990). Accounting and organization change. *Accounting, Auditing & Accountability Journal*, 3(1), 7-17.
  - 21) Horngren, C. (1995). Management accounting: This century and beyond. *Management Accounting Research*, 6, 281-286.
  - 22) Justesen, L. - Mouritsen, J. (2011). Effects of actor-network theory in accounting research. *Accounting, Auditing & Accountability Journal*, 24 (2), 161-193.
  - 23) Kaplan, R.S. and Norton, D.P. (1996). 'Using the balanced scorecard as a strategic management system', *Harvard Business Review*, 74(1), pp. 75-85.
  - 24) Kober, R. Ng, J. Paul, B. J. (2007). The interrelationship between management control mechanisms and strategy. *Management Accounting Research*, 18(4), 425-452.
  - 25) Kreiner - Mouritsen. (2003). Knowledge management as technology – Making Knowledge Manageable, In: *The Northern Light: Organization Theory in Scandinavia*, eds. Czarniawska, B. & Sevón, G. 223-247, Stockholm: Liber.
  - 26) Langfield-Smith, K. (1997). Management control systems and strategy: A critical review. *Accounting, Organizations and Society*, 22(2), 207-232.
  - 27) Latour, B. (1997). On Actor-Net Work theory: A few Clarifications. [http://www.nettime.org/Lists-Archives.nettime-l-9801.msg00019.html](http://www.nettime.org/Lists-Archives/nettime-l-9801.msg00019.html).
  - 28) Latour, B. (2005). *Reassembling the social: An introduction to Actor-Network Theory*, Oxford University Press.
  - 29) Lino ,C; Andrea, T, (2010). Strategic management accounting and business strategy: a loose coupling? *Journal of Accounting & Organizational Change* Vol. 6 No. 2, pp. 228-259.
  - 30) Mintzberg, H. (1994). 'Rise and fall of strategic planning', *Harvard Business Review*.
  - 31) Musa ,L; Mahmoud, Sh, M, (2014). Strategy, Accounting, Strategic Management and Performance of Companies Listed in Tehran Stock Exchange. *Journal of Management Accounting*, 7 (20), 107-93.
  - 32) O'Regan, N; Ghobadian, A. (2002). 'Formal strategic planning: the key to effective business process management?', *Business Process Management Journal*, 8(5), pp.11-22.
  - 33) Papazova, E Mihaylova, L, (2015). Organization of Management Accounting Information in the Context of Corporate Strategy. *Procedia - Social and Behavioral Sciences* 213, 309 – 313.

- 34) Papazov, E; Mihaylova, L. (2010). 'Information Provision for Strategic Planning in Bulgarian SMEs', *Review of International Comparative Management*, 11(4), pp. 575-581.
- 35) Pascal, N; Gonn, W, (2006). Characteristics of the strategic planning process and the relevance of management accounting: evidence from German DAX30 companies. [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1004091](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1004091).
- 36) Pipan, T; Czarniawska, B. (2010). "How to construct an actor-network: management accounting from idea to practice", *Critical Perspectives on Accounting*, Vol. 21 No. 3, pp. 243-251.
- 37) Rahnamaye Roodposhti, F; Nejadoulami, B (2016). Management accounting ontology in the context of postmodernity (implementation, actor-network, and applications). *Accounting and Audit Management Knowledge*, (9), No. 29, pp.1-13
- 38) Rahnamaye Roodposhti, F (2008). *Basics of Management Accounting Approach and New Perspective*. Volume I, Tehran, Terme Publication.
- 39) Reza Gh, Noor A, M, Meisam, K; Norkhairul, H; B (2015). The Relationship among Strategy, Competition and Management Accounting Systems on Organizational Performance, *European Online Journal of Natural and Social Sciences*, Vol.4, No.3 pp. 565-581.
- 40) Robert, S,(1987). *Accounting Control Systems And Business Strategy: An Empirical Analysis*. *Accounting Organizations and Society*, Vol. 12, No. 4, pp. 357-374.
- 41) Rogers, P.R. Bamford, C.E. (2002). 'Information planning process and strategic orientation: the importance of fit in high-performing organizations', *Journal of Business Research*, 55, pp. 205-215.
- 42) Roslender, R; Hart, S. (2003). *Marketing and Management Interfaces in the Enactment of Strategic Management Accounting Practices: An Exploratory Investigation*. London: CIMA.
- 43) Ruben B; Davar R, (2017). Project accountability: An exploratory case study using actor-network theory. *International Journal of Project Management* 35, 1024-1036
- 44) Schwenk, C. (1995). 'Strategic decision making', *Journal of Management*, 21(3), pp. 471-493.
- 45) Seal, W. (2001). Management accounting and the challenge of strategic focus. *Management Accounting Research*, 12(4), 487-506.
- 46) Shank, J.K. Govindarajan, V. (1993). *Strategic cost management: The new tool for competitive advantage*. New York, NY, USA: The Free Press.
- 47) Simons, R. (1987). Accounting control systems and business strategy: An empirical analysis. *Accounting, Organizations and Society*, 12, 357-374.
- 48) Skaerbaek, P; Tryggestad, K. (2010). The role of accounting devices in performing corporate strategy, *Accounting, Organizations and Society*, 35 (1), 108-124.
- 49) Steiner, G.A. (1979). *Strategic planning: What every manager must know*. New York: Free Press
- Ward, J.L. (1988). 'The Special Role of Strategic Planning for Family Businesses. *Family*', *Business Review*, 1, pp. 105-117.
- 50) Suresh C, Richard D, Ian P,(2012). Strategic management accounting and strategy practices within a public sector agency. *Management Accounting Research* 23, pp. 245- 260.
- 51) Ward, K. (1993). 'Accounting for a sustainable competitive advantage', *Management Accounting*, 71(9), pp. 36