

Artículo de investigación

Studying the Use of Costing Systems and Its Impact on Managers' Performance in Tehran Stock Exchange

Estudiar el uso de los sistemas de cálculo de costos y su impacto en el desempeño de los gerentes en la Bolsa de Teherán

Estudar o uso dos sistemas de cálculo de custos e seu impacto no desempenho das gerentes na Bolsa de Teerã

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Abstract

This study examines the effect of managers' use of costing systems, through the power of psychology, on their performance. In this research, the four-dimensional conceptual psychological strength (meaning, competence, self-determination and impact) has been considered, and the term "performance" has been used to refer to the individual performance of managers in relation to their tasks. We consider managers' performance as a subset of individual performance, and specifically focus on how well people do their tasks.

To test the hypotheses, we conducted at first a survey of mid-level managers, including 107 financial managers and production managers of active companies in the Tehran Stock Exchange; then the results were analyzed using the PLS model.

The results indicated that despite the confirmation of a significant relationship between the managers' use of costing systems and all four dimensions of psychological strength, none of these variables affect the performance of managers. The current research extends previous researches of costing systems and increases our understanding of the role in improving effectiveness of costly systems.

Resumen

Este estudio examina el efecto del uso de los administradores de los sistemas de cálculo de costos, a través del poder de la psicología, en su desempeño. En esta investigación, se ha considerado la fuerza psicológica conceptual cuatridimensional (significado, competencia, autodeterminación e impacto) y el término "desempeño" se ha utilizado para referirse al ejercicio individual de los gerentes en relación con sus tareas. Consideramos el desempeño de los gerentes como un subconjunto del desempeño individual y específicamente nos enfocamos en cuán bien las personas hacen sus tareas.

Para probar las hipótesis, realizamos al principio una encuesta de gerentes de nivel medio, que incluía 107 gerentes financieros y gerentes de producción de compañías activas en la Bolsa de Teherán; luego los resultados fueron analizados usando el modelo PLS.

Los resultados indicaron que a pesar de la confirmación de una relación significativa entre el uso de los administradores de los sistemas de costos y las cuatro dimensiones de la fortaleza psicológica, ninguna de estas variables afecta el desempeño de los gerentes. La investigación actual amplía las investigaciones previas de los

Keywords: understanding, costing system, psychological strength, performance of managers

sistemas de costos y aumenta nuestra comprensión del papel en la mejora de la efectividad de los sistemas onerosos.

Palabras clave: comprensión, sistema de costos, fortaleza psicológica, desempeño de los gerentes

Resumo

Este estudo examina o efeito do uso de sistemas de cálculo de custos pelos gestores, através do poder da psicologia, em seu desempenho. Nesta pesquisa, nós consideramos o conceitual psicológica vigor cuatridimensional (significado, competência, auto-determinação e impacto) e o termo "performance" tem sido usado para se referir ao desempenho individual dos gestores em relação às suas tarefas. Consideramos o desempenho dos gerentes como um subconjunto do desempenho individual e nos concentramos especificamente em como as pessoas fazem sua lição de casa.

Para testar a hipótese, foi realizada uma pesquisa no início de gerentes de nível médio, incluindo 107 gerentes financeiros e gerentes de produção das empresas ativas na Bolsa de Teerão; Em seguida, os resultados foram analisados usando o modelo PLS.

Os resultados indicaram que, apesar de confirmação de uma relação significativa entre a utilização do sistema de administradores de custo e os quatro dimensões de resistência psicológica, nenhuma destas variáveis afecta o desempenho dos gestores. A pesquisa atual estende investigações anteriores de sistemas de custos e aumenta nossa compreensão do papel na melhoria da eficácia de sistemas dispendiosos.

Palavras-chave: compreensão, sistema de custos, força psicológica, desempenho dos gerentes

Introduction

Management is an integral part of the organization. Effective and successful managers are the less well-known treasures of any organization. The greater we spend capital, strength and time for recognizing their personality and behavioral dimensions, we can increase the efficiency, effectiveness, and, consequently, more productivity and better performance of organizations in the country (Saatchi, 2014). Managers need to know enough about the company's costing system in order to fulfill their tasks, they must understand the weakness and strength of the company's costing system. The costing system, like other corporate systems, is constantly subject to refinement and modification and for these changes the executive managers are responsible (Etemadi & Shamszadeh, 2004).

Achieving the goals of costing systems cannot be optimally possible without the need for psychology. What slows down the work, interrupts the work, and wastes talent and creativity and facilities, is that the manager does not have enough knowledge about his organizational environment and the morals, desires and creativities, as well as the systems used in the organization. (Amin Azad, 1997).

Costing systems are part of a wider management information systems that are used to improve performance in an organization. Costing systems, as information systems, potentially have the ability to increase managers' understanding of the organizational conditions in which decisions are made, improve managers' judgment and decision makings, and thereby improve productivity.

The present research examines the relationship between managers' use of costing systems and their performance, and following the research of Sprayzer (1995), the four-dimensional conceptual psychological strength (meaning, competence, self-determination and impact).

Delone and McLean (2003) argue that evaluating the success of any information system requires not only the examination of factors at the technical level (ie, the factors relating to the system's correctness/efficiency), but also requires a review of the semantic level. At the semantic level, it is important to note how much the user pays attention to the system and how much he/she is eager to use. Moreover, since users experience the characteristics of the system, it is very important that the success of the system is also evaluated at the impact level, ie how the system affects people's work and how people see themselves to be of influence during the use of system and what beliefs do they have about their control

and influence. Self-determination is another dimension of psychological strength that is being examined; in this dimension, we will focus on the subject how much the users of the system enjoy autonomy and freedom in the course of doing their tasks. The fourth dimension of psychological strength is competence; it refers to whether and in what extent the users are confident in their ability and capabilities in relation to the costing system.

In general, in this research, we are trying to contribute existing research literature by examining the psychological/behavioral factors associated with the use of costing systems. Hence, in line with Mahama and Cheng's research (2013), costing systems are considered as an emerging executive concept.

Theoretical foundations

In order to create a positive or negative understanding of the costing system, managers need a conceptual basis. In this research, along with Mahama and Cheng (2013), costing systems are considered as an emerging executive concept. In general, costing systems are part of a wider management information systems that are used in organizations to improve performance. Costing systems, as information systems, potentially have the ability to increase the understanding of managers of the organizational environment in which decisions are made, improve managers' judgment and decision makings, and thereby enhance productivity (Anderson et al., 2002; Chenhal, 2004). In other words, costing systems are interconnected and handheld computer units used to collect, analyze, and manage cost and activity-oriented data for calculating information on cost items, better cost management, management and development of strategy, improving product planning decisions and improving managers' judgment (Afkhami, 1996). While, in principle, these benefits are possible, but in practice, organizations are difficult to realize these benefits (Bhimani, 1996; Innes et al, 2000).

It should be noted that since the 1980s there has been an increasing interest in costing systems, and this interest has been created by changing the company's vision, including changes in production technology, global competition, and shorter product lifecycle, and the ability of costing systems to provide more benefits. (Al-Omiri & Drury, 2007). As a result, management accounting researchers have tried to figure out how much successful these systems are for achieving organizational benefits (Mahama & Cheng, 2013). The psychological strength has also been raised by some accounting research as the main factor in linking the activities of management accounting and individual performance (Drak et al, 2007; Hall, 2008).

Spayzer (1996) believes that in order to make people feel strength and ability, they must understand the role of the environment as an element that gives them more freedom, rather than an element that limits them. This suggests that psychological strength is an important variable through which managers' understanding of costing systems can affect their performance. This subject can potentially form the basis of the conceptual mental model in establishing the relationship between the use of system, the psychological strength and the performance of managers, and found the hypotheses assumed for the present research.

In this research, we are trying to contribute existing research literature by examining the psychological/behavioral factors associated with the use of costing systems and the results that this has for the performance of managers. It is also expected that by increasing the use of costing systems, by virtue of psychological strength dimensions, better performance be achieved by managers.

Research background

(Domestic researches)

So far, much research has been done on the benefits of using costing systems in Iran, and all of them have an emphasis on the importance of activity-based costing systems and emphasize the important role of this system in management accounting (eg Abdi, 2001; Qorbani, 2005; Ebrahimzadeh & Teymouri Fard, 2009; Soltani & Salimian, 2012); however, it is believed that the achievement of these benefits is not possible without regard to behavioral considerations (Namazi, 2008). For this reason, it is felt necessary that more research be done in this area.

In relation to the performance of managers, many researches have also been conducted from various perspectives. Mahdavian (1979), in an article related to the performance of managers, states that evaluating work-based performance and competence emphasizes evident behavioral aspects, and a manager whose behavior is more productive and produces more desirable and worthwhile will have a higher position in the performance appraisal system.

Jafari and Delawari (2005) have investigated the relationship between managers' competence and their performance. The results of the research showed that there is a relationship between managers' competence and their performance.

Regarding the use of costing systems, Mohammad Namazi (2008), in an article titled *A review of the activity-based costing system in management accounting and its behavioral considerations*, states that the higher the use of the activity-based costing system, the cost of production will be reduced.

In a research, Etemadi & Dianati Deylami (2009) studied the performance of managers; the results confirmed that in collectivist societies or organizations, the participation of people in budgeting, even with proper management accounting information, does not lead to a successful performance of the manager. But there is a positive relationship between the management accounting system and the manager's performance in individualist organizations with low power distance.

Yousefinezhad Attari & Nishabouri Jami (2009) examined the complexity of measuring the performance of leadership and management; this study stated that managerial perception of the complexity of measuring performance is very important. Their findings suggest that the implementation of the performance measurement system enables the conversion of performance measurement data into useful information, and the use of this information enables allocation of resources to appropriate activities that results in better financial performance and profitability.

Also, the article on a comprehensive costing system based on the activity and economic value-added of Soltani & Salimian (2012) comes to the conclusion that by increasing the use of the activity-based costing system, while reducing costs and eliminating activities without value-added, the development and improvement of the process and increase in Quality is aligned to improve performance.

Namazi & Zare (2017), in a research, investigated the design of a costing system based on time-oriented activity with a fuzzy approach and its results showed that there exists a significant difference between the cost price of products by the traditional costing method and the costing method based on the time-oriented activity.

(Foreign researches)

Aronson and Mettee (1968) conducted a study on the competence and performance of individuals, and the results showed that the group that had a positive image about its personality had better performance than those who had a negative view of its competence and self-esteem.

Delone and McLean (1992) have concluded that in considering the application of these costing systems the consideration of the nature and extent of use is important.

Spears et al in 1997 analyzed the dimensions regarding the relationship between psychological empowerment, effectiveness, job satisfaction, and work problems. Their research results suggest that employees need to experience each dimension of empowerment in order to achieve the motivation needed to achieve the expected results.

In their article, *Psycho-empowerment as a multidimensional structure*, Kraimer et al (1999), following Spears's (1995) research, accurately studied the four dimensions proposed for psychological strength by him (self-determination, competence, influence, and giving meaning). But this study was conducted on hospital nurses rather than managers. Finally, this study showed that four different dimensions of psychological strength are related to organizational commitment and career goals.

Sprayer (1995) argues that psychological strength increases concentration, innovation and flexibility, and this leads to effective performance. Specifically, each of the four dimensions of psychological empowerment has been associated with a number of effective performance conditions.

The results of Kathuria & Davis's research (2001) suggest that in order to increase managerial performance in production with an emphasis on high quality, it seems that managers who use techniques such as planning, informing, and consulting with staff before making important decisions, and focus on motivating employees and inspiration, reward programs, and employee support, they have a better performance. Anderson et al. (2002) named their article "the Characteristics affecting the performance of costing system based on activity, and studied costing system in the automotive industry. The results of this research indicated that costing systems, as information systems, would potentially enable managers to increase their understanding of the organizational conditions in which they make decisions, improve managers' decision-makings, and thus improve productivity.

In Warren's article (2006), entitled Development of Performance Measurement Systems and the assessment of the capabilities of these systems, the final result suggests that the perception of events and objects affect behavior. In general, positive perception is related to a more favorable attitude towards what is perceived and negative perception leads to reactions that are less desirable.

In a research done by Hall (2008), it is observed that the result emphasizes the role of cognitive and motivational mechanisms in explaining the impact of management accounting systems on managerial performance; in particular, the results show that managers' knowledge of these systems affects managerial performance. The access of managers to information is associated also with their sense of empowerment.

Scott (2009) explores the relationship between the cost and complexity of the system, the objectives of the use and the effectiveness of the cost system. He states that when the cost of designing system (for example, its complexity) and its use objectives are greatly in accordance, the performance of the cost system is more effective.

In 2009, Borney et al also explored the relationship between system features, organizational competence, and performance; according to them, an understanding of the features of the systems designed could help resolve some problems with its use. Also, when people are more competent, performance improves. The results of the research conducted by Rosman et al (2012) in relation to performance indicate that if there is an accurate monitoring of management at different levels of the organization, we will see better performance.

Mahama and Cheng (2013) in their research, the effect of managers' perceptions on the use of costing systems, psychological strength, and task performance, found that there is a positive relationship between managers' perception and awareness of the costing system and the rate of using these Systems by them, and the more utilization of the system is related to the four dimensions of psychological strength (meaning, competence, self-determination and impact). Finally, the rate of use of the costing system through the dimension of competence in psychological strength has an indirect effect on the performance of managers. Kruis and Widener (2014) examined the impact of managers on the design of performance evaluation systems and argued that the existence of managerial influence in designing evaluation of performance systems would reduce the likelihood of failure of these systems and increase the understanding of these systems.

Campbell et al (2014), in their review of business strategy in measuring multiple performance, measured the company's internal performance over a two-year period. Balanced Scorecard information was used to identify strategy-related problems and factors that may have led to failure of the strategy and to understand how the evaluation system could be used to test and validate business strategy. As a result, the advantages and disadvantages of the strategy were identified and, while confirming the hypotheses of this research, it was found that the self-confidence of managers was also a very influential factor.

Lau & Scully in 2015 studied the role of organizational policies and justice in management performance. By collecting a questionnaire from 104 managers and applying the least squares method, the results indicated that organizational policies and people's perceptions of justice have a significant role in measuring non-financial performance of managers. In contrast, the intermediary effect of organizational policies and fairness regarding financial performance were insignificant.

Main goals of the research

The purpose of this research is to provide evidence for how the managers' use of costing systems through psychological dimensions influence their performance. Because most of the previous researches in this area focus on the technical design aspects of these systems (such as the complexity of the costing system, the choice of cost drivers and cost sources) as a variable for explaining the success of costing systems in improving the quality / relevance of cost information for decision making and improvement of Organizational performance (Christensen & Demski, 1997; Anderson & Young, 1999; Bromwich & Hung; 1999; Ittner et al., 2002). Other researchers have criticized the excessive emphasis on technical design of costing systems and stressed the need for research to investigate the impact of behavioral factors on the success of the costing system (Shields and Young, 1989; Shields, 1995; Foster and Swenson, 1997). McGuane & Clammer, 1997; McGuane, 1998; Anderson et al., 2002; Chhenahal, 2004). In fact, in this research, instead of focusing on the designers of the costing systems, they are focused on their end users.

Research question

The main issue of this research is concerned with whether managers' more use of costing systems of cost price through the psychological strength can ultimately lead to better performance and result in the company?

Research hypotheses

Four hypotheses have been considered in this research:

First Hypothesis: There is a positive and direct relationship between the managers' use of the costing system for cost management and their psychological strength.

Second hypothesis: There is a positive and direct relationship between the managers' use of the costing system for cost management and their performance.

Third Hypothesis: There is a positive and direct relationship between the psychological strength of managers and their performance.

Fourth hypothesis: There is a positive and indirect relationship between the managers' use of the costing system for cost management and their performance through psychological strength.

The conceptual model in Figure 1-1 shows the relationship between the variables in the four hypotheses above.

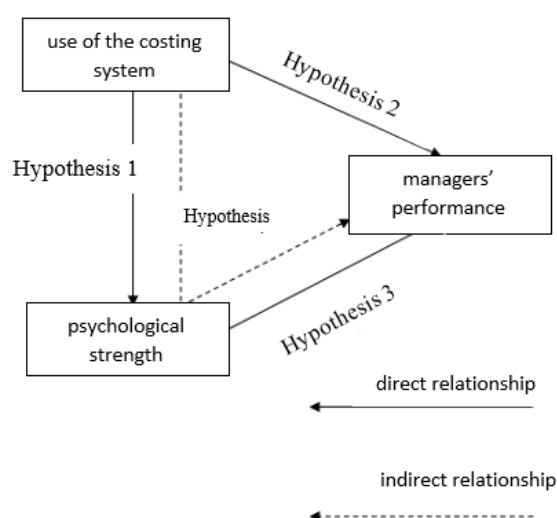


Diagram 1: Conceptual model of relation between hypotheses

Statistical population

In this research, middle level managers including financial managers and managers of production companies active in Tehran Stock Exchange have been considered as statistical population. The reason for choosing middle managers is based on previous research findings, since in this level the managers are important theoretically because their work varies from relatively structured to non-structured levels and they have access to more information and resources (Johnson & Frohman, 1989; Sprayzer et al., 1997); therefore, since the present research focuses on information generated by costing systems, the selection of middle managers was most appropriately identified. Then, to identify the middle managers in the companies, we searched for phone numbers and mailing addresses on the Internet. Initially, for testing, 30 questionnaires were sent by email after telephone call with the managers and justifying them that the questions were considered to be completely confidential and would only be used for ongoing research without reference to the respondent's profile, and after obtaining consent of the managers; but unfortunately, only 5 questionnaires were received by email, despite follow-up and reminder. This is explained by the fact that corporate managers were reluctant to fill in the questionnaires and, while accepting responsibility for the call phase, they did not actually send an answer; so, it was decided that the questionnaires should be distributed in person. Therefore, with direct and continuous recourse to large and well-known companies, despite the many problems and lack of proper cooperation of managers, the completion of the questionnaires continued to reach the desired number.

Sampling method

Sampling approaches to the issues studied are different and subject to research conditions (Sarmad et al., 2007). In the present research, according to the objectives of the study based on which selected companies should use costing systems, it was tried to select the companies that are large enough⁵³ and well-known, because these companies are likely to use proper costing systems, therefore, the Purposeful or judgmental sampling method was used. This type of sampling is selected based on personal judgment or study objectives and is unpredictable sampling (Sarmad et al., 2007).

The sample size of the research at the beginning of the research executive phase was calculated according to the results of similar researches and using Cochran's test, as to be equal to 107. Of course, in this research, it was distributed about twice of the sample size of the questionnaire, but due to the lack of

⁵³ In Iran, the size of business units has been defined based on the criteria of the Ministry of Industry and Mines. According to official statistics, the business units having fewer than 150 staff members have been introduced as moderate units and those having less than 50 people as small units. In this research, we tried to survey large business units with a large number of personnel and more than 150 people.

cooperation of the managers, with much effort, the minimum required was collected. It should be noted that the selected companies as respondents in this research include food manufacturing companies, paper products, automotive machinery, equipment and parts.

Research method

The variables of this research are measured using the Likert seven-part scale. The survey tool is a questionnaire; it includes questions that have been tested by various researchers, and in the whole the expression of these questions is clear. The collected data are analyzed using partial least squares (PLS) method. Structural Equation Modeling (SEM) is done in Smart PLS software. In fact, PLS is a component-based modeling method that seeks to minimize errors. The advantage of using PLS is its ability to use a small sample. This research is based on a questionnaire with 31 variables (questions) and an independent variable (the rate of use of costing systems). The psychological strength is considered as an interventional variable that has four dimensions (self-determination, impact, competence and meaning), the managers' performance is also appeared as a dependent variable; these hidden variables are determined using factor analysis of their related measurement equations.

Testing hypotheses

Prior to conducting path analysis (structural model), a confirmatory factor analysis (measurement model) must first be implemented and, in fact, we examine the question of whether the selected questions provide an appropriate factor structure for measuring the dimensions studied in the research model.

Convergent validity measures the amount of the correlation of the scales of each variable; this is measured using the AVE (Mean Extracted Variable). In cases where the composite reliability and mean variance are more than 0.3, they are acceptable and those that are more than 0.5 are desirable (Chin, 1998; Holand, 1999). Therefore, given that the mean values of variance are more than 0.3 in this research, it can be concluded that the selected questions provide a suitable factor structure for measuring the dimensions studied in the research model. Also, the factor load and the t-statistic, whichever is greater, is more favorable. In this study, these criteria are of great magnitude. Hair et al (2010) argue that in the interpretation of the significance of criteria, the sample size should also be considered. For our sample size (107), these values were detected as optimal.

Also, considering that the data has been collected through the self-measurement questionnaire, responses are likely to be influenced by the common approach bias. While there was not enough means in the research project to minimize the effects of this bias, a number of other statistical analyzes were made to ensure whether the common approach bias was serious. Harman's one-factor test was performed for measuring diagnostic validity and the results are shown in the table below.

Table I: diagnostic validity

Variables	Use	Competence	Effectiveness	Significance	Self-determination	Performance
Use	0/686					
Competence	0/175	0/750				
Effectiveness	0/258	0/392	0/762			
Significance	0/269	0/159	0/350	0/672		
Self-determination	0/223	0/105	0/342	0/388	0/997	
Performance	0/368	0/159	0/256	0/462	0/420	0/554

In this table, the determinant numbers are on the main diameter, which are derived from the root mean variance in Table I and represent the diagnostic validity. Due to the large size of the numbers on the main diameter, the results indicate that it is unlikely that the common approach bias is a serious problem (Chin et al., 2012).

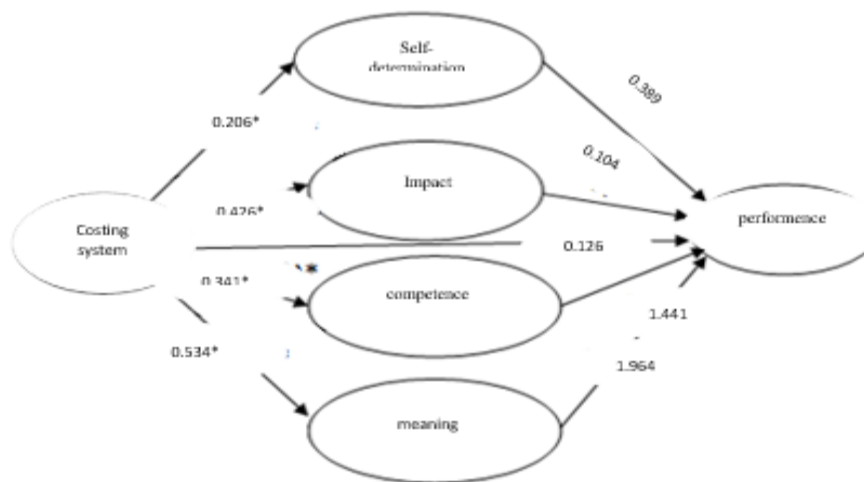


Diagram 2: PLS structural model with path coefficients

p<0.05 *
107= n

Table 2: PLS results
Path coefficient, t-statistic (in parentheses) and R²

Variables	Costing System Use (CMAN)	Self-determination (SELF)	Impact (IMPACT)	Competence (COMP)	Meaning (MEAN)	Performance (PERF)	R ²
Costing System Use (CMAN)	-	0/206 (1/771)*	0/426 (2/702)*	0/341 (2/339)*	0/534 (1/888)*	0/126 (0/170)	0/044
Self-determination (SELF)						0/389 (0/535)	0/140
Impact (IMPACT)						0/104 (0/211)	0/080
Competence (COMP)						1/441 (0/598)	0/070
Meaning (MEAN)						1/964 (0/516)	0/036
Performance (PERF)							0/382

p<0.05 *
107= n

Items marked with an asterisk (*) indicate that their P value is less than the 5% of error level; it is meaningful.

Conclusion according to hypotheses of this research

Conclusion about non-meaningful paths is difficult, but previous findings from Hall (2008) allow us to reflect on the reasons for the relative confirmation for the hypotheses. As previously mentioned, Sprayzer (1995)

claims that the individual's work position affects psychological strength. Our results for the paths that relate psychological strength to performance and Hall's results (2008) state that differences in the use and purposes of accounting systems may explain which dimension of the psychological strength is prominent in justifying performance. While in Mahama and Cheng's research, there are significant relationships between competence and self-determination paths on the one hand and performance in the use of costing systems, Hall (2008) observed that only meaning dimension is associated meaningfully with the performance of managers, in the situation where the Comprehensive Performance Measurement systems (CPMS) are used. In the present research, no relationship is observed between the dimensions of psychology and performance.

Based on the findings of this research, in coincidence with Mahama and Cheng (2013), we conclude that costing systems emphasize the use of cost information for actions and decisions (for example, use of cost information for budgeting). This can be a possible explanation that underlies a strong relationship between the dimensions of competence and self-determination of psychological strength and the performance of managers. In contrast, the emphasis on delivering performance feedback in CPMS and the stronger link between CPMS and strategy can be a valid justification for the importance of meaningful dimension in justifying the performance of managers in Hall (2008).

Neither Hall, nor Mahama & Cheng's Research, nor the present research have any meaningful results for the dimension of impact; so we conclude that the effects of the performance resulting from the impact dimension are less prominent when they come to specific accounting information systems. These conclusions are worth checking in the empirical environment.

According to a summary of the structural model results from Diagram 2 and Table 2, the final results of the study of the hypotheses have been summarized in the following table.

Table 3: Final results of research hypotheses

Hypothesis number	Hypothesis	Type of relation	Final result
First hypothesis	relationship between the use of costing systems and psychological strength	Direct	Confirmed
Second hypothesis	relationship between the use of costing systems and managers' performance	Direct	Rejected
Third hypothesis	relationship between psychological strength and managers' performance	Direct	Rejected
Fourth hypothesis	relationship between the use of costing systems through psychological strength and managers' performance	Indirect	Rejected

Recommendations for future researches

Future researches can expand our proposed structure by examining other influential organizational and individual variables, and may carry out this research at a wider level, or compare the effect of managers' use of costing systems and final performance in different public and private sectors. It is also possible to examine, compare and differentiate the performance of other middle managers, such as sales and marketing managers, in addition to the managers of production in relation to these systems; in conducting future researches we can use also more complex costing systems such as costing systems based on activity or purpose.

Research limitations

This research has been accompanied by specific issues and limitations. The lack of cooperation of managers in answering research questions, the lack of value for the research culture for some respondents, as well as the lack of awareness of some respondents of the importance and urgency of research have created significant barriers to the research process. In addition, the novelty of the subject and, as a result, the lack of familiarity of the members of the statistical population caused a not so strong cooperation in providing the data needed for research. The lack of researches, resources, and related books provided a lot of problems for the possibility of comparing the findings; due to the lack of competitive space in terms of Quality and price, the motivation of companies to use advanced accounting systems is low and this over time becomes more problematic and worrying.

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