



## The Impact of Management Control Systems on Contemporary Management Accounting Practices in the Public Sector

**Mohammad Nazaripour**

Assistant Professor, Accounting Department, University of Kurdistan, Sanandaj, Iran  
(Corresponding Author)  
mnazaripour@yahoo.com

**Farzad Ravand**

M.A in Accounting, Accounting Department, University of Kurdistan, Sanandaj, Iran  
farzadravand2@gmail.com

### ABSTRACT

The purpose of this paper is to investigate the effect of the interactive and diagnostic use of management control systems on the adoption and success of contemporary management accounting practices in the public sector. Contemporary management accounting practices includes: benchmarking, activity-based costing, the balanced scorecard, value chain analysis, total quality management, key performance indicators and strategic cost management. The required data were gathered through questionnaire. The population of this study is the financial experts of the public sector organizations of Kermanshah, Kurdistan and Hamadan provinces. The data were analyzed using structural equation model with partial least squares (Smart PLS) method. According to the research findings, the interactive and diagnostic use of management control systems have a meaningful and positive impact on the adoption and success of contemporary management accounting practices. This means that 53% and 33% of changes in the using of contemporary management accounting practices can be explained by the interactive and diagnostic approaches. Among the contemporary management accounting practices, key performance indicators, value chain analysis and strategic cost management are the most effective respectively. According to the research findings, the contemporary management accounting practices not only are beneficial for the public sector organizations but also empower them.

### Keywords:

Contemporary Management Accounting Practices, Interactive Approach, Diagnostic Approach, Public Sector, Success.



## 1. Introduction

The activity environment of today's public sector organizations is so changeable and is affected by characteristics such as economic globalization, intensify competition, and deregulation of state-owned enterprises (Visser & Togt, 2016). Role of accounting information in such turbulent environments is very important with management accounting practices being one of the important sources of organizational information. Traditional management accounting practices had some limitations in meeting the needs of organizations for information because they were short-term, internally and financially oriented, and they have been criticized for not being consistent with continuous environmental changes (Nuhu et al., 2017). Therefore, contemporary management accounting practices have been designed to enhance competitiveness, quality and customer focus (Helden & Richard, 2018). Reforming and strengthening public sector management requires the use of innovative private sector management ideas, encourage the adoption of contemporary management accounting practices in public sector organizations (Cosimato, Torre, & Troisi, 2015). Contemporary management accounting practices conduct public sector organizations to improvement of performance, customer focus, and managing results (Modell, 2012). Finally, these practices play a crucial role in meeting the requirements of the public sector such as: accountability, efficiency, and effectiveness, and they are suitable for meeting the information needs of today's organizations, the activity environment of which is extremely turbulent (Nuhu et al., 2017). Adopting management accounting practices for the development of public sector organizations is crucial (Chia and Koh, 2007), but according to results of research (Baird, 2007) the adoption rate of such practices among public sector organizations is low. Thus, given this low rate, analysis of factors associated with the adoption of contemporary management accounting practices needs theoretical and practical endeavors to be done. Collecting enough evidence about changes related to management accounting and the role of management accountants requires better understanding of management accounting changes in the context of public sector (Sulaiman and Mitchell, 2005).

The first purpose of this study is to examine the relationship between interactive and diagnostic uses of

management control systems and the adoption of a number of specific contemporary management accounting practices in the public sector using contingency theory (Lopez-Valerias et al., 2016). In interactive approach, the management through using control systems involves constant interaction and communication between managers of all hierarchical levels. Top management is encouraged to be regularly involved in the decision activities of subordinates. These ongoing decision making activities highlight the changing conditions of organizations and the need for adjusting existing control mechanisms (Su et al., 2017). The diagnostic approach to using controls aims to monitor outcomes and correct any deviations from preset performance standards. It conserves management attention by allowing managers to focus on critical performance variables which are linked to the implementation of organizational strategies (Su et al., 2017). There are limited studies examining the influence of the management control systems on contemporary management accounting practices, with the few existing studies limited to the use of the balanced scorecard (Agostino and Arnaboldi, 2012).

The second purpose of this study is to respond to the requests for examining the effects of interactive and diagnostic approaches on the use of contemporary management accounting practices in the public sector (Bedford and Malmi, 2015). Particularly, this study attempts to analyze the effects of interactive and diagnostic approaches when there are no pre-determined arrangements. Because of focus on providing a holistic view of how to use management control systems and not considering the interdependency between the practices, this method can be considered an appropriate one (Malmi and Brown, 2008).

The third purpose of this study is to examine how much successful public sector organizations have been in adoption and using of contemporary management accounting practices. While contemporary management accounting practices are mostly meeting the needs of private sector, due to the differences between goals and organizational environment of public and private sectors (Modell, 2012), so this issue whether management principles and processes of the private sector are useable in the public sector or not gets more important (Alford and Greve, 2017). Given the existence of different perspectives about the effectiveness of procedures used in the private sector

in the public sector, doing more research on effectiveness of contemporary management accounting practices in the context of the public sector is necessary.

The remainder of this paper is structured as follows. In the next section, an overview of the approaches related to using management control systems and contemporary management accounting practices along with basics of making the hypotheses will be offered. In the third section, the research methodology and the measurement of the variables will be discussed. In the fourth section, research findings are reported, and lastly the fifth section includes discussion, conclusion, limitations, and suggestions for further research.

## **2. Literature Review**

### **2.1. Contemporary management accounting practices**

Management accounting practices are tools and methods which, through offering relevant information, can help organizations in both effective and efficient use of resources and managing them with the purpose of creating added value for their customers and stockholders (Langfield-Smith, 2009). These practices are divided into traditional and contemporary groups. Traditional management accounting practices consist of cost-benefit analysis, return on investment, and standard costing and variance analysis, are those management accounting practices that are financial and internal in orientation; short-term focused; and involve arbitrary cost allocations (Pavlatos and Paggios, 2008). Traditional management accounting practices have been criticized for their natural inability in meeting the needs for information in order to facilitate changes and challenges in the business environment; therefore, contemporary management accounting practices have been developed (Amani, 2018). Some of the contemporary management accounting practices which are used by organizations are: activity-based management, activity-based costing, balanced scorecard, key performance indicators, value chain analysis, and strategic cost management. These practices have emphasized quality, speed, effectiveness of cost, competitiveness, and customer focus, and they look suitable for today's business environments (Abdel-Maksoud et al., 2012).

Of the distinguishing feature of contemporary management accounting practices is a strategic in nature, making a link among operational and strategic goals, and integrate both financial and non-financial information (Obob and Ajibolade, 2017). In order for public sector organizations to be able to provide quality services and attract customer's satisfaction, they should make constant reforms and use contemporary management accounting practices (Nuhu et al., 2017).

### **2.2. Using Contemporary Management Accounting Practices in the Public Sector**

Traditional management accounting practices match more with traditional public sector control requirements such as bureaucratic red-tape and standardized rules (Angelakis et al., 2015). On the other hand, contemporary management accounting practices are a part of new private sector management practices with which the public sector can make considerable progress (Lapsley and Wright, 2004). Balanced scorecard has been particularly recognized in the public sector, because it has played a crucial role in catering the direction of this sector from process-orientation to product-orientation (Modell, 2012). Since customer focused and quality oriented are of great importance to public sector organizations, so using contemporary management accounting practices such as total quality management for public sector organizations plays an important position (Zubair, 2013). Similarly, a requirement for improving efficiency and accountability is met by optimizing resources, which this can also be realized by means of contemporary cost management practices such as activity-based management and costing, strategic cost management, and value chain analysis.

### **2.3. Methods of Using Management Control Systems**

The basis of doing some researches related to management control systems is derived from levers of control framework introduced by Simons (1995), which has four subsystems: beliefs, boundaries systems, interactive and diagnostic control systems. The number of studies conducted in the field of beliefs and boundaries systems is low, but the number of studies in the field of interactive and diagnostic control systems is considerable (Su et al., 2015). Beliefs are an

explicit set of organizational norms that senior managers communicate formally and reinforce systematically to provide values, purpose and direction to the organization. For example, the organization should attempt, by offering quality services to its customers, to create values (Frezattia et al., 2017). Boundaries come in two forms: business conduct and strategic-decision alignment. Any conglomerate having multiple consumer brands have existed worldwide for a long time. Yet, its geographic business units are still the dominant voice in the matrix, empowered to adapt products to local habits and tastes. Also, the brand positioning is very clear as well as there is no violation of brand boundaries. (Bisbe and Otley, 2004). Instead of mere focus on the strategic dimension, this study attempts to cover operational activities of organizations. Therefore, the purpose of current study is to examine the effect of interactive and diagnostic uses of management control systems on the adoption of contemporary management accounting practices.

The diagnostic control system seeks to ensure that decisions align with the goals of the organization (Simons, 1995). Frequently, when authors refer to management control system, they typically only refer to the diagnostic information system. The diagnostic control system is the formal system of organizational information that monitors results and corrects deviations from expected performance standards (Chenhall and Moers, 2015). Interactive Control System is a management system used to provide strategic feedback, track new ideas, trigger new organizational learning, and to properly position the organization for the future: incorporating process data into management interaction, face-to-face meetings with employees, challenging data, assumptions and action plans of subordinates (Bisbe and Malagueno, 2009).

## **2.4. Effect of Using Management Control Systems on Contemporary Management Accounting Practices**

This section examines the effect of interactive and diagnostic approaches in the use of management control systems on the adoption of contemporary management accounting practices. No official hypothesis about contemporary management accounting practices has been developed. However,

the effect of interactive and diagnostic approaches in the use of management control systems on the contemporary management accounting practices has been discussed instead, because the main purpose of this study is to examine overall effect of these kinds of approaches on the adoption of contemporary management accounting practices as a package.

### **2.4.1. Interactive Use of Management Control Systems**

Since management control systems (interactive approach) foster organizational learning and encourage new ideas to appear, so using them will most probably facilitate the process of adopting contemporary management accounting practices (Ferreira and Otley, 2009). Furthermore, interactive use of management control systems emphasizes exchange of views and interactions; therefore, it can increase understanding and knowledge of organizations using this approach regarding the role of contemporary management accounting systems. Particularly, organizations which insist on using management control systems (interactive approach) are able to use contemporary management accounting practices (e.g. benchmarking) to achieve such goals as organizational learning and the emergence of new ideas. Moreover, contemporary management accounting practices are tools which organizations can, through them, employ to adapt innovative ideas and learn from the best performing firms or units (Langfield-Smith, 2009). Also, with contemporary management accounting practices serving as tools for the formulation of strategies, using management control systems (interactive approach) can increase the possibility of these practices to be adopted. Since management control systems (interactive approach) cause new strategies to appear and develop, so using contemporary management accounting practices can play a considerable role in formulating them (Busco et al., 2012).

Given that interactive use of management control systems causes the promotion of innovation, so organizations using these systems (interactive approach) have more motivation to adopt contemporary management accounting practices. Also, since interactive use of management control systems encourages inter-section relationships, so organizations using these systems (interactive approach) have a more serious motive towards

adopting contemporary management accounting practices. Thus, the first hypothesis is as follows:

**Hypothesis 1:** Interactive use of management control systems has a meaningful effect on adoption of contemporary management accounting practices.

#### 2.4.2. Diagnostic Use of Management Control Systems:

Contemporary management accounting practices such as benchmarking, balanced scorecard, key performance indicators can help organizations in meeting their pre-determined goals. Therefore, since diagnostic use of management control systems has a special emphasis on using management control systems as a feedback mechanism to create constraints and to facilitate compliance, so contemporary management accounting practices can be easily adopted in organizations using such systems (Theriou et al., 2009). Moreover, as diagnostic use of management control systems is concerned with monitoring the performance of staff and/or units, so contemporary management accounting practices can facilitate this process.

According to (Songini et al., 2013), since diagnostic use of management control systems has a positive relationship with using cost leadership strategy, contemporary management accounting practices such as activity-based costing, strategic cost management, and value chain analysis can ensure that resources are efficiently used to meet the set objectives and targets. Therefore, the second hypothesis is as follows:

**Hypothesis 2:** Diagnostic use of management control systems has a meaningful effect on adoption of contemporary management accounting practices.

#### 2.5. Effectiveness of Contemporary Management Accounting Practices in the Public Sector:

Studies on the success of contemporary management accounting practices mostly emphasize the success of activity-based costing/management practice. In such studies, effectiveness has been defined as overall use and accuracy, firm's value increase, and perceived success (Byrne et al., 2007). Given various definitions of success, Bagdadli and Gianecchini (2018) believe that it is better to allow users to rate the degree of success relevant to their

objectives. Likewise, this study attempts to measure the success of contemporary management accounting practices through posing this question "To what extent do you perceive using contemporary management accounting practices in your organization useful?"

The theoretical relationship between adoption of contemporary management accounting practices and their success their level of success is implied based on the premise that an organization needs to use management accounting practices to a large extent to realize the benefits of such practices (Baird et al., 2007). For example, according to Phan et al. (2014) the extent of adoption of activity-based costing/management practice is remarkably resulted from its level of success. Furthermore, relationship between adoption and the success of contemporary management accounting practices has been acceptable, because importance of provided information by such practices will, in the case of minimum use, decrease (Nuhu et al., 2017).

Relationship between adoption and the success of contemporary management accounting practices has been explainable through system implementation literature, because according to this literature that the extent of use of a system impacts the benefits derived from using the system (Pierce and Brown, 2006). Also, information system literature shows that the more the rate of adoption of systems increases, the more the success of inter-organizational systems increases through the acquired benefits (Tuomela, 2005). Therefore, the third hypothesis is as follows:

**Hypothesis 3:** Implementing contemporary management accounting practices in the public sector is effective.

### 3. Methodology

Since the current study aims to investigate the impact of management control systems on contemporary management accounting practices in the public sector, the research method was applied as well as a descriptive-analytical and correlational analysis. The research population consisted of financial employees of the public sector organizations located in Kurdistan, Kermanshah, and Hamadan provinces. Using random sampling, 225 employees were selected as the research sample. Totally, 190 completed questionnaires were taken into consideration for data analysis since 35 incomplete questionnaires were

ignored. To increase the response rate, the authors of this article personally distributed the questionnaires and explained the aim of the research to the selected sample. Since employees may provide unrealistic answers should they get the notion that the research is conducted by the company, and that such information may affect their position, the authors assured them that all the data and information provided by the respondent would be kept very confidential, and that it was just an academic research. Also, the questionnaires were anonymous, thus decreasing the employees' fear of risk.

**Measurement:** To achieve the study objectives, a researcher-made survey questionnaire was developed based on the findings of the literature review. The questionnaire was pre-tested and revised. The survey consisted of eight parts covering the following issues: (1) Management control systems, (2) Contemporary management accounting practices, and (3) demographics. Management control systems include two variables namely interactive approach (with twelve items) and diagnostic approach (with eight items) as well as contemporary management accounting practices include seven variables namely benchmarking (with three items), activity-based costing (with three items), the balanced scorecard (with four items), value chain analysis (with three items), total quality management (with three items), key performance indicators (with three items), and strategic cost management (with three items).

Measurement of all variables were carried out by a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The advantage of using an interval scale is that it permits the researchers to use a variety of statistical techniques which can be applied to nominal and ordinal scale data in addition to the arithmetic mean, standard deviation, product-moment

correlations, and other statistics commonly used in management research. The respondents' demographic information include age, gender, educational level, working position, and experience. About 64% of the respondents were male and 36% were female. Descriptive statistics also shows that about 14% of the respondents had worked for 1–10 years, about 74% had worked for 11–20 years, and about 12% had worked for more than 20 years.

**Convergent and Divergent Validity:** Validity of the questionnaire has been examined by two factors, convergent and divergent validity, which are unique to the structural equation modelling. Convergent validity tests that constructs that are expected to be related are, in fact, related. Discriminant validity (or divergent validity) tests that constructs that should have no relationship do, in fact, not have any relationship (Hulland, 1999). To assess the convergent validity, AVE factor (average variance extracted) related to first iteration variables was used (table 1).

Since the composite reliability of all variables above 0/7 and the average variance extracted of all variables is also higher than 0/5, therefore the convergent validity and reliability of the present study can be confirmed. In order to increase AVE and improve the overall fitness of the model, questions 1, 4 and 12 related to the interactive approach were eliminated.

The differential validity refers to the difference between the validity coefficients that exists between two groups. This can be detected in SEM models by comparison of factor loadings for the same measurement model estimated for different subpopulations, by visually inspecting the coefficients for the subpopulations (Bollen, 1989).

**Table 1. Convergent and Divergent Validity**

| Latent Variables | Average Variance Extracted (AVE) | Composite Reliability (CR) | Diagnostic Approach | Interactive Approach | Contemporary Management Accounting Practices (CMAP) |
|------------------|----------------------------------|----------------------------|---------------------|----------------------|---|
| Diagnostic       | 0/5515                           | 0/8957                     | 0/74                | -                    | -   |
| Interactive      | 0/5286                           | 0/9087                     | 0/6305              | 0/73                 | -   |
| CMAP             | 0/5981                           | 0/9121                     | 0/6607              | 0/6762               | 0/77  |

### 4. Results

The effect of management control systems on contemporary management accounting practices has been measured in the framework of structural model. According to Figure 1, the effect of management control systems on contemporary management accounting practices is meaningful; therefore, interactive use of management control systems has a positive and meaningful effect on using of contemporary management accounting practices (hypothesis 1), which based on standard coefficients, 53% of changes made from using contemporary management accounting practices are predicted. Also, diagnostic use of management control systems has a positive and meaningful effect on using contemporary management accounting practices (hypothesis 2), which based on standard coefficients, 33% of changes made from using contemporary management accounting practices are predicted. Causal coefficients on the paths between the two main constructs of the study indicate an effect of management control systems (interactive and diagnostic uses) on using of contemporary management accounting practices.

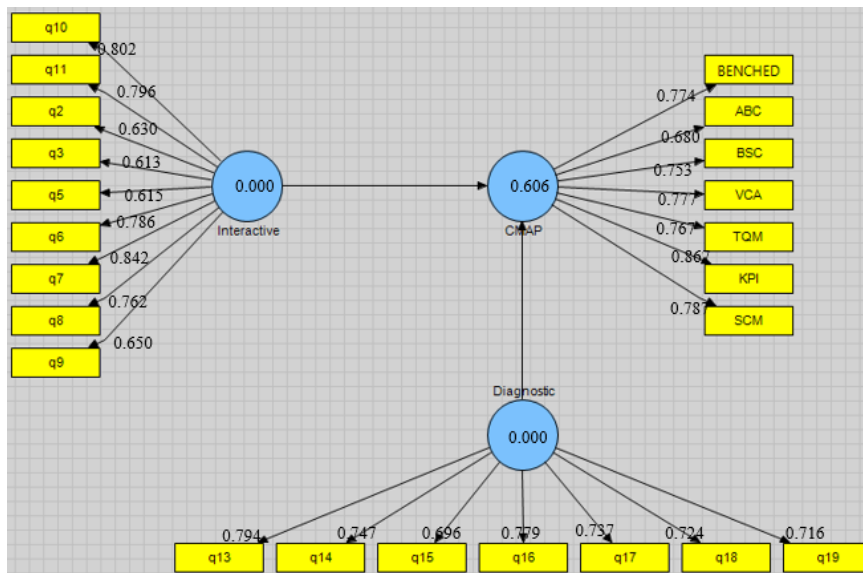
According to Table 2, R<sup>2</sup> coefficient is related to the endogen variable of contemporary management

accounting practices (CMAP). According to Chin (1998), an R<sup>2</sup> above 0/67 is substantial, above 0/33 is average, above 0/19 is poor, and under 0/19 is not relevant. High R<sup>2</sup> is preferable. With regard to the value of 0/606, the fitness of the structural model is confirmed. Since the Stone-Geisser test (Q<sup>2</sup>) is above zero, the model has estimation relevance. GoF will vary from 0 to 1. According to Wetzel et al., (2009), GoF values of .1 = small, .25 = medium, and .36 = large. Since the calculated GoF for this study is 0/58, then the model is appropriateness.

**Table 2. The goodness of fit index**

| Endogenous variable | R <sup>2</sup> | Q <sup>2</sup> | Communality | GOF    |
|---------------------|----------------|----------------|-------------|--------|
| CMAP                | 0/606          | 0/355          | 0/5594      | 0/5821 |

To confirm the research hypotheses, the Bootstrapping command in Smart PLS software was used which the output shows the result of t coefficients (Figure 2). When the absolute value of the t-value is greater than 1.96, with 95% confidence level, the research hypothesis is confirmed (Winzi et al., 2010). According to figure 2, since the t coefficients of all paths are greater than 1.96, so the research hypotheses are confirmed.



**Figure 1: Standardized Coefficients of the Research Model**

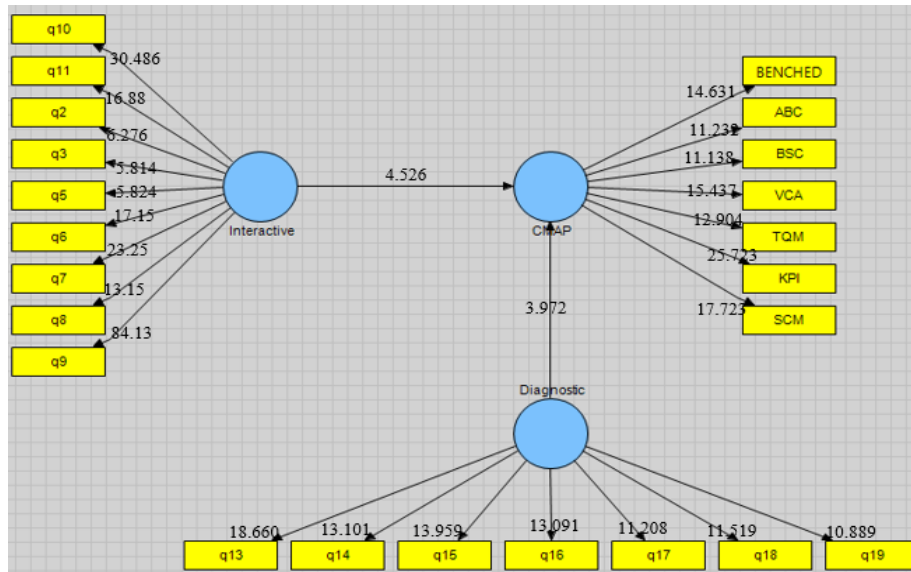


Figure 2: Meaningfulness of Coefficients of the Research Hypotheses

**Hypothesis 3:** Implementing contemporary management accounting practices in the public sector is effective

According to Table 3, the composite reliability of all variables is higher than 0.7 and their AVE is also higher than 0.5, then, convergent validity and reliability of the current research can be confirmed.

Discriminant Validity determines whether the constructs in the model are highly correlated among them or not. It compares the Square Root of AVE of a particular construct with the correlation between that construct with other constructs. The value of Square Root of AVE should be higher than the correlation.

Table 3. Convergent and Divergent Validity

| Latent variables                 | CR   | AVE  | KPI  | SCM  | ABC  | BSC  | TQM  | BENCH | VCR  |
|----------------------------------|------|------|------|------|------|------|------|-------|------|
| Key performance indicators (KPI) | 0/88 | 0/71 | 0/84 | -    | -    | -    | -    | -     | -    |
| Strategic Cost Management (SCM)  | 0/88 | 0/72 | 0/67 | 0/85 | -    | -    | -    | -     | -    |
| Activity Based Costing (ABC)     | 0/74 | 0/51 | 0/48 | 0/58 | 0/72 | -    | -    | -     | -    |
| Balanced Scorecard (BSC)         | 0/85 | 0/60 | 0/57 | 0/42 | 0/37 | 0/78 | -    | -     | -    |
| Total Quality Management (TQM)   | 0/90 | 0/74 | 0/71 | 0/47 | 0/36 | 0/51 | 0/86 | -     | -    |
| Benchmarking (BENCH)             | 0/82 | 0/63 | 0/55 | 0/57 | 0/80 | 0/46 | 0/40 | 0/79  | -    |
| Value Chain Analysis (VCR)       | 0/83 | 0/63 | 0/60 | 0/54 | 0/38 | 0/71 | 0/65 | 0/45  | 0/79 |

**Findings of the Third Hypothesis:**

According to figure 4, since the t coefficients of all paths are greater than 2.58, so all paths of the model at confidence level 0.99 are positive and meaningful.

Since the Stone-Geisser test ( $Q^2$ ) for VCA, KPI, BENCH, SCM, ABC, BSC and TQM is 0.39, 0.51, 33, 0.43, 0.24, 0.33, 0.42 respectively; then the model has estimation relevance. Finally according to figure 3 the



variables KPI, VCA and SCM with beta coefficients of 0.86, 0/805 and 0/783 respectively have the most impact on contemporary management accounting practices.

To confirm the research hypotheses, the Bootstrapping command in Smart PLS software was used which the output shows the result of *t* coefficients (Figure 4).

When the absolute value of the *t*-value is greater than 1.96, with 95% confidence level, the research hypothesis is confirmed (Winzi et al., 2010). According to figure 4, since the *t* coefficients of all paths are greater than 1.96, so the research hypotheses are confirmed.

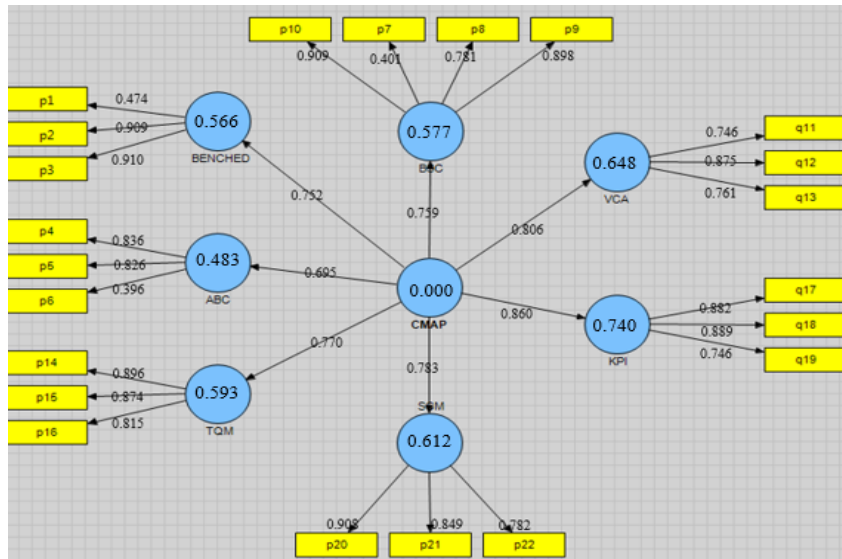


Figure 3. Standardized Coefficients of the Third Hypothesis

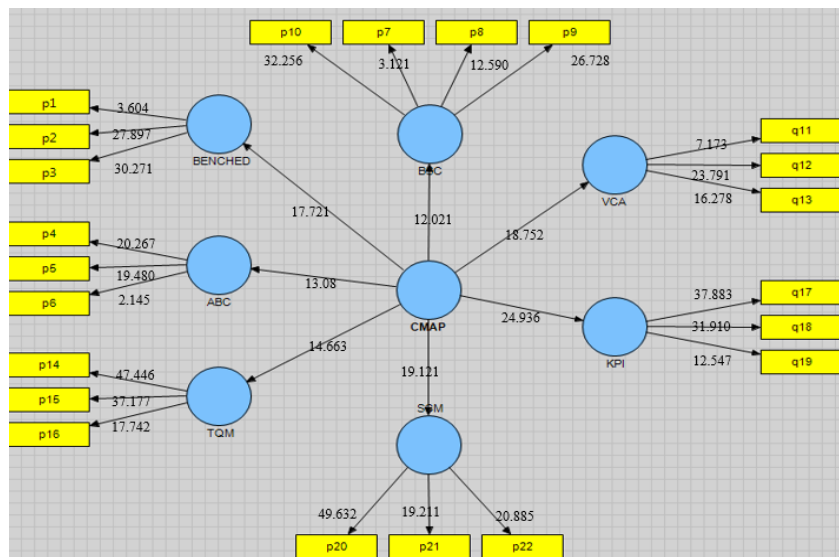


Figure 4. Meaningfulness of Coefficients of the Third Hypothesis

## 5. Discussion and Conclusions

The purpose of this study is to investigate the impact of contemporary management accounting practices in improving and promoting the public sector performance. To do so, through reviewing the existing literature, factors affecting the acceptance and success extents of the contemporary management accounting practices in the public sector with the aim of providing practical applications have been studied.

Findings of this study can improve the existing literature in the following ways: (1) by studying the contingency factors influencing the adoption of contemporary management accounting practices, the current study can enhance the literature of the subject. In studying the contingency factors, a special emphasis was put on the role of relevant interactive and diagnostic approaches using management control systems. The findings, by paying attention to interactive and diagnostic approaches which exhibiting contrasting features, can reinforce theoretical background of the competing value theory, which this, in turn, can play a remarkable role in the organizations' use of contemporary management accounting practices. (2) The study extends the previous management accounting studies on factors influencing the success of contemporary management accounting practices through studying the effective factors in using contemporary management accounting practices and shows that adoption of such practices has an effective role in their success.

Moreover, current research has practical uses, too. With the purpose of using contemporary management accounting practices as advocated by the public sector reforms, it is necessary for public sector organizations to reinforce relationships among the various aspects of management control systems. This is made possible by increasing the intensity of using management control systems in interactive and diagnostic approaches. Since the main use of management control systems in the public sector is traditionally more diagnostic in nature, so according to Batac and Carassus (2009) interactive use of management control systems can complement diagnostic use. Therefore, interactive and diagnostic uses of management control systems are effective in public sector organisations, so given the low rate of interactive use of management control systems in the public sector, placing more emphasis on increasing the use of management control systems in this sector is an undeniable necessity.

The findings show implementing contemporary management accounting practices, along with having benefits for organizations, can also enhance the public sector performance. In fact, the findings show the moderate levels of success and low rate of adoption of contemporary management accounting practices experienced by public sector organisations. This means that, unlike the private sector, the success of public sector organizations has not been remarkable.

Like many survey researches, the current research has some limitations in making for causality, so future researches could replicate this study by adopting alternative research approaches. Furthermore, this study has studied the impact of management control systems (interactive and diagnostic approaches) on adopting the contemporary management accounting practices, but other aspects (for example, management control systems characteristics) have not been considered. Considering the impact of other aspects on adopting contemporary management accounting practices, this could be the subject of future researches.

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