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Factors Influencing the Level of Sophistication of Cost System: Evidence from Hotels in Bahrain

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ABSTRACT

This paper reports on the research findings of the relationship between contextual variables and the level of sophistication of costs system in hotels in Bahrain. A unique feature of this research is the use of different dimensions of sophistication in order to provide an overall measure of sophistication. Data was collected from hotels in kingdom of Bahrain. Results indicate that the higher level of sophistication of cost system in hotels are positively associated with the intensity of competition, the use of cost information, and the quality level of the hotel. No association is found between the level of sophistication of cost system and the cost structure, the degree of decentralization, and the size of the hotel.

Keywords: Size; cost structure; intensity of competition; the use of cost information; degree of decentralization; level of sophistication of cost system.

1. INTRODUCTION

Prior research relating to cost system design adopted the contingency theory to examine factors influencing cost system design in manufacturing companies. A major issue was the measurement of the level of sophistication of a cost system. Different measures of sophistication were observed including: the adoption and non adoption of activity-based costing (ABC) [1, 2], the allocation of indirect costs to products/services [1, 3-6], the number of cost pools [3, 7], and the nature of cost pools, nature of cost allocation bases [3, 7]. Pizzini [8] and Pavlatos and Paggios [9] measured the sophistication in terms of cost system attributes (i.e. functionality) including: the level of details, the ability to disaggregate cost according to behavior, the frequency of reporting, and the calculations of different variances.

Given the diverse measures of sophistication of cost system, it seems difficult to compare the results of previous research [5]. Furthermore, Al-Omiri and Drury [1] suggested that future research might

consider to improve the measurement of the variables included in their study. This implies that there were unsatisfied with the measurement of the sophistication of cost system and the contextual variables used in their study.

According to Central Bank of Bahrain [10], labor forces that are working in Bahrain's tourism industry ranging from 8,025 to 9,725 employees in 2007 to 2011 respectively. Number of rooms in hotels is ranging from 7,020 to 7,085 in 2008 to 2011 respectively and number of tourism nights are ranging from 2,494, 122 to 1,898,823 in 2007 to 2010 respectively. It seems that hotels play a major role in the Bahrain's economy; therefore, studying the cost system design in the Kingdom of Bahrain is of particular importance.

Pellinen [11] argued that evidence relating to cost accounting and its use in hotels is limited. Furthermore, Collier and Gregory [12] noted that hotels are key components of hospitality industry; nevertheless, the hotel industry is seriously under-researched. Also, Chenhall [13] realized that hospitality and tourism industry provides opportunities for future research. Also, Drury and Tayles [7] argued that cost system at services organization is likely to be more sophisticated than those used by manufacturing organizations. Furthermore, Pavlatos [14] suggested that future research might examine other important contextual variable influencing the design of cost system in service industry.

Based on the previous discussion, this research aims to examine the relationship between different contextual variables and the level of sophistication of the cost system.

2. LITERATURE REVIEW

Literature review relating to cost system design in hotels has focused on different aspects. The early cost system design literature was mainly concerned with the possible use of traditional cost system in Hotels [15]. Many studies had concentrated on cost structure at hotels. For example, many researchers [e.g. 16, 17, 18] found that the percentage of indirect costs to total costs represented a high proportion. In a study that aimed to suggest a model for measuring segmental profit in the Hilton Hotel, Nordling and Wheeler [19] suggested a model for measuring segmental profit in the Hilton Hotel in Las Vegas. They analyzed overhead costs into three groups: departmental, identifiable overhead, and non-identifiable overhead. The analysis of the activities in allocating overhead costs was not completed in the study. However, the study is considered a pioneer study in examining overhead costs in hotels. Recently, Sanjeev, Jauhari [20] examines the factors influencing cost structure in the Indian hotel sector. The results indicated that hotels are actively involved in finding methods of reducing costs without sacrificing quality.

In intervening years, cost and management accounting systems in hotels had been examined by many researchers. For Example, Collier and Gregory [12] explored the use of strategic management accounting using six case studies in UK hotel sector. The results indicated that finance function (i.e. including accounting) are becoming more involved in strategic accounting including planning and ad hoc practices on the market conditions and competitors analysis. The diffusion of the use of strategic management at hotels is consistent with the high degree of competition in the hotel industry. Also, Brignall [16] used the contingency theory to examine costs system design in service organizations including: a management consultancy partnership, a hotel chain, a newsagents chain, and a hospital. He concluded that a hotel had a high proportion of fixed costs with 30% of fixed costs were semi-variable relating to marketing, administration, utilities and maintenance, and promotion. Also, the department contributions (revenues less traceable costs for rooms, bar, restaurant and reception) were used.

Another strand of literature focuses on the use of variable or absorption costing in hotels. Brignall [16] found that a full product costing were not in use and cost traceability was difficult. Pavlatos and Paggios [21] examined management accounting practices in Greek hotels. Their study included cost accounting practices in 85 hotels in Greece. The results indicated that the majority of hotels(56%) used absorption costing, followed by variable costing which was used only by 20% of respondents and a few of respondents (20%) used standard costing. They justified the results on the ground that absorption costing is required by legislation for preparing annual published financial statements. Also, Pellinen [11] examined the relationship between the cost accounting and pricing in tourism industry. The results indicated that only companies with the strongest competitive positive were able to use absorption costing for pricing decisions.

Also, prior literature had concentrated on the adoption and non-adoption of ABC in service organizations. Al-Omiri and Drury [1] examined the relationship between different factors and the cost system sophistication using a sample of 100 UK manufacturing and service firms. They used four different measures for cost system sophistication including: (1) ABC adopters and Non-ABC adopters, (2) number of cost pools in the first stage cost allocation, (3) types of overhead allocation bases, and (4) the use of direct or absorption costing. The results indicated that there were significant relationships between the importance of cost information, size and all of the four measures of cost system sophistication. Furthermore, there were no significant relationships between the quality of information technology, product diversity, cost structure and any of the four measures of cost system design. In hotel industry, Pavlatos and Paggios [9] examined the adoption of ABC in Greek hotels. The results indicated that ABC was used only 23.5% of respondents; therefore, ABC was not widely used in Greek hotels. Also, Pavlatos [22] examined the potential contextual variables influencing the adoption of activity-based costing (ABC) in Greece hotels. He examined a sample of 112 hotels. The results indicated that Twenty-nine out of the 112 (26%) adopted ABC. Also, the results revealed that there was a positive association between the adoption of ABC and business strategy, and chief financial officer's (CFO) educational background. Furthermore, there was a negative association between the adoption of ABC and CFO age. No association was found between the adoption of ABC and the quality of information technology, membership of multinational chain, and CFO tenure. Similarly, Vaughn Baloglu, Erdem [23] examined the ABC costing as a substitute of traditional allocation of support Kitchen in a Las Vegas Casino. They argued that traditional allocation was based on a single variable costs (i.e. the food costs); however, ABC could be applied as an effective tool that analyzed activities into unit level, batch level, and product sustaining and used different allocation bases rather than a single cost allocation base (i.e. food costs).

Another steam of literature examined the role of ABC in customer profitability analysis (CPA). Noone and Griffin [24] demonstrated the implementation of CPA using ABC. Furthermore, Dalci, Tanis [25] examined the implementation of customer profitability analysis (CPA) using time-driven activity-based costing (TDABC) in a Turkish hotel. The results indicated that some of the customer segment were found unprofitable under the traditional ABC were determined profitable using TDABC. Therefore, this study advocated the use of TDABC for hotel; however, there is limited attention for the current use of TDABC in hotels' cost systems.

In addition, the literature suggests different measures for the level of sophistication of cost system Therefore, it seems difficult to compare the results among prior research. Also, Al-Omiri and Drury [1]

argued that the measurement of level of sophistication is subject to measurement errors and biases. Also, there is little attention on the design of cost systems in Bahrain's hotels.

3. RESEARCH HYPOTHESES

A. Cost Structure

Brierley, Cowton [4] argued that cost structure for non-manufacturing firms is different from manufacturing firms. In non-manufacturing firms, there are no or few direct materials and indirect costs (overheads) may represent a large proportion of total costs; however, direct costs (i.e. direct materials and labor) are usually the largest cost incurred by manufacturing firms. The differences in cost structure could explain why non-manufacturing firms tend to be more likely to adopt ABC than manufacturing firms [7, 26]. This implies that the level of sophistication of cost system design is a function of the percentage of total indirect cost (i.e. overhead) to the total costs [27]. As the percentage increases, it is likely that hotels will adopt a sophisticated cost system. Many researchers [e.g. 16, 17, 18] found that the percentage of indirect costs to total costs represented a high proportion; therefore, hotels are more likely to adopt more sophisticated cost system. Based on the above discussion, the following hypothesis is tested:

H1: The more the percentage of indirect costs (overheads) to the total costs in a hotel, the more the level of the sophistication of cost system.

B. Degree of Decentralization

The cost and management accounting literature [e.g. 28, 29-31] argued that the degree of decentralization affects the cost and control systems. In decentralized organizations, authority for making decisions are delegated to lower-level managers that creates opportunity to change their management and control system according to their needs [32, 33].

Drawing on Zimmerman [34] argument that companies tend to allocate costs when it is difficult to observe and measure performance, Ugras [35] argued that cost allocation is likely to occur at organizations with numerous levels in their hierarchy which he assumed to be a feature of greater decentralization. This argument implies that there is a positive association between degree of decentralization and the level of sophistication of cost system design.

Based on the above discussion, the following hypothesis is formulated:

H2: The greater the degree of decentralization in a hotel, the greater the level of sophistication of cost system.

C. Size of the Hotel

Size is the most frequently cited contingent factor in cost and management accounting literature [e.g. 13, 36]. The literature [31, 37] argued that size is positively associated with cost accounting sophistication. More specifically, Many researchers [34, 38] argued that larger organizations tend to use costs allocation as a monitoring device. Also, Khandwalla [39] found that large organizations were more divisionalized and use mass production techniques and more sophisticated controls. Previous studies relating to adoption of activity-based costing [40-42] had found a positive relationship between size and the adoption of activity-

based costing. Also, Drury and Tayles [7] argued that large organizations have more resources to adopt more sophisticated cost system.

Al-Omiri and Drury [1] argued that large organizations have sufficient resources to adopt sophisticated accounting systems. Also, Lamminmaki [43] argued that larger hotels tend to use more sophisticated accounting systems relating to outsourcing decisions. Similarly, Pavlatos and Paggios [9] argued that size is correlated with cost system functionality.

Based on the above discussion, the following hypothesis is tested:

H3: The larger the size of the hotel, the more the level of sophistication of cost system.

D. Intensity of Competition

A pioneer study had been undertaken by Khandwalla [39]. He found a positive relationship between the intensity of competition and the management control system. Libby and Waterhouse [37] suggested that the use of sophisticated accounting system when companies facing intense competitive market. Merchant, Bruns [44] argued that the intensity of competition is the most important factor for encouraging directors to questioning the appropriateness of their cost system. This implies that companies face intense competition would adopt a sophisticated cost system.

Based on the above discussion, the following hypothesis is tested:

H4: The greater the intensity of competition, the more the level of sophistication of cost system.

E. The use of Cost Information

Innes and Mitchell [41] argued that information derived from ABC could be used for different purposes including: stock valuation, product or service pricing, decisions relating to product range and component subcontracting, cost reductions, value added analysis, classification of activities, activities mapping, budgeting, new product or service design, customer profitability analysis, performance measurement and cost modeling. Similarly, Kaplan and Cooper [26] argued that cost system may be used for different purposes including inventory valuation, product pricing, customer profitability analysis, new product design, performance measurement and budgeting. Furthermore, Downie [45] argued that there is a need to develop appropriate accounting information for making marketing decisions in hotels.

The major issue in the previous literature is the relationship between the use of cost information and the sophistication of cost system design. For example, Anderson (1995) argued that cost information could be used in pricing decisions, cost reductions and special cost studies. Furthermore, the different uses of cost information (i.e. strategic decisions and cost reduction) may explain the adoption of ABC (i.e. sophisticated cost system). In the same line of argument, Cagwin and Bouwman [46] examined different uses of cost data including product costing, cost reduction, pricing decisions, special cost studies and capital expenditure. They argued that a sophisticated cost system can reduce cost distortions if the improved cost information is used in decision-making process in a firm. Also, Drury and Tayles [7] argued that cost information can provide information that is relevant in managing product/service mix and applying profitability analysis. They argue that cost system should determine profitable activities and products/services in order to avoid dropping profitable product/service and keeping unprofitable product/service. Furthermore, Al-Omiri and

Drury [1] and Schoute [6] argued that there is positive relationship between the use of cost information and the level of sophistication of cost system. Also, Pavlatos [14] suggested that the use of cost data (i.e. cost determination, budgeting, decision-making, and performance evaluation) might explain why firms adopt traditional cost system or a more sophisticated system (i.e. ABC)

Drawing off the above discussion, the following hypothesis is test:

H5: The more the use of cost information, the more the level of sophistication of cost system.

F. Quality Level of Hotel

According to Lamminmaki [43], quality is a distinguish feature that is reflected on the sophistication of management and cost accounting systems in a hotel. He argued that higher quality hotels will have more sophisticated management accounting systems to support higher quality service. Similarly, it can be argued that higher quality hotels will have more sophisticated level of cost system since those higher quality hotel may have sufficient resources to adopt more sophisticated cost systems. In the light of this discussion, the following hypothesis is formulated:

H6: The higher the quality of a hotel, the more the level of sophistication of cost system

4. RESEARCH DESIGN AND DATA COLLECTION

The Ministry of Culture in Bahrain-Tourism Sector- has been contacted in order to determine the total number of hotels registered at the ministry of culture. The total number of hotels is 114 ranging from 5 stars to unclassified hotels. Hotels stars rating 5, 4 and 3 are 11, 41 and 35 hotels respectively. Therefore, the sample size is 87 (11+41+35). It was assumed that 5, 4 and 3 stars hotel would have a cost system and it is less likely to have a cost system at 2, one stares, and unclassified hotels. The details of the hotels (i.e. name, address, fax, and telephone number) have been provided by the Ministry of Culture in Bahrain-Tourism Sector.

There are several methods of collecting data including survey questionnaire, experiments, case studies, and archival studies [47]; Sekaran [48] A survey questionnaire is used since it is appropriate to collect data quickly, where the population is widely thinly spread, and when the questions require consultations with other employees or require reference to company's records [47-49].

Based on the literature relating to cost system design and contingency theory literature, the questionnaire consists of three sections. In the first section (section A), respondents were asked questions relating to cost systems at their hotels. The second section (section B), respondents were asked questions relating to contextual variable and their perception of the performance. The final section (section C) includes questions relating to personal information which includes job title, length of time working at the hotel, and whether the respondent is a member of professional accounting body. Also, respondents were asked to tick a box if they wanted to receive a copy of the research's results. The questionnaire was accompanied by a covering letter that explained the aim of the research and assured the confidentiality of the information provided by the respondents.

A pilot study was undertaken in order to get feedback from respondents on the questionnaire design before distribution to the entire sample. A copy of the questionnaire was to distributed to five financial

managers working at hotels. They suggested some alterations and clarifications of some questions. After taking the feedback from the pilot study, a final version of the questionnaire has been prepared.

Three hotels returned the questionnaire without answers because it is not the hotel policy to answer any questionnaire. The total number of usable questionnaire is 41 and the response rate is 48.8% (41/87-3). 34 of respondents (82.9%) managers ticked this box; thus, suggesting the content of the questionnaire and, in turn, the research was of particular importance of the respondents. The results indicated that 11 (26.8%) of the responding hotels were 3-stars, 25 (61%) of the hotel were 4-satrs, and 5 hotels (12.2%) were 5-stars. Also, the majority of responding hotels (36, 87.8%) were city hotels and only 5 hotels (12.2%) were resorts. The respondents were classified according to the management status of the hotel; 19 (46.3%) of the hotels were private companies, 17 (41.5%) of the hotel were members of national chain, and 5 (12.2%) of hotels were members of international chain. Also, the respondents were classified according to their job title into 17 financial managers (41.5%), 13 accountants (31.7%), 10 departmental managers (24.4%), and only one respondents was a general manager. 40 respondents (97.65) were a member of professional body and only one respondents (2.4%) was not a member of professional body. Also, respondents were classified according to the length of time working at the hotel into 16 (39%) of respondents were working at the hotel for a period less than 2 years, 16 (39%) of the respondents were working for a period from 2 to 5 years, and 9 (22%) of the respondents were working at the hotel for a period more than 5 years.

Based on the assumption that late respondents are more closely resemble non-respondents, a non-response bias was undertaken by comparing the early responses with the last responses in respect of all variables included in this research. T-test statistics revealed that there were no significant difference between early and late responses; therefore, there was no evidence of non-response bias.

	<i>N</i>	<i>%</i>
<i>Hotel Category:</i>		
3-stars	11	26.8
4-stars	25	61
5-stars	5	12.2
<i>Hotel type:</i>		
Resort	5	12.2
City Hotel	36	87.8
<i>Hotel management status:</i>		
Private company	19	46.3
Member of national chain	17	41.5
Member of international chain	5	12.2
<i>Job title:</i>		
Financial manager	17	41.5
General manger	1	2.4
Departmental manager	10	24.4
Accountant	13	31.7
<i>Length of time working at the hotel:</i>		
Less than 2 years	16	39
2-5 years	16	39
More than 5 years	9	22

	N	%
Less than 30%	5	12.2
30-40%	6	14.6
40-50%	20	48.8
50-60%	6	14.6
More than 60%	4	9.8
Total	41	100.0

^aDescriptive statistics of the respondents

^bSample of a Table footnote. (Table footnote)

^cCost structure

Respondents were asked to indicate the percentage of indirect costs to the total costs of the hotel on 5-point likert scale ranging from less than 30% to more than 60%. The results indicated that 48.8% of the hotels had indirect costs to the total costs ranging from 40 to 50% and 14.6% of the hotels has a percentage ranging from 50 to 60%. Also, there were different percentages of indirect costs to the total costs in other hotels. This result is consistent with prior studies. For example, many researchers [16-18] found the indirect costs represented a high percentage of the total costs.

Degree of decentralization was measured using a construct developed by Gordon and Narayanan [50]. On a 5-point scale, respondents were asked to indicate the extent to which authority delegated from top management to lower level managers to make decision relating to development of new products/services, the hiring and firing of managerial personnel, selection of large investment, pricing of new products/services and significant price changes, and budget setting. The scale was ranging from 1 (no delegation at all) to 5 (extremely delegated). The reliability of the multiple items scales was assessed using Cronbach's Alpha for internal consistency of constructs and the minimum acceptable level of Alpha was 0.50 [51]. A cronbach Alpha for the 5-items construct was 0.518 which was considered acceptable. An overall measure for the degree of decentralization was obtained by averaging the score of the 5-items (Mean = 2.76; SD = 0.700; Minimum = 2; Maximum = 4)

Size of the hotel was measured using the total annual sales of the hotel and number of rooms. In question B1, respondents were asked to determine the total number of rooms of their hotels. Prior research used the number of rooms as a measure of the size of the hotel [9, 18, 43]. The number of rooms varied among the 41 responding hotel. The minimum was 14 and the maximum was 120. Mean and standard deviation (SD) were 41.59 and 26.256 respectively.

Intensity of competition was measured using an instrument developed by Khandwalla [39] and was widely used. Lamminmaki [43] altered the construct to be suitable for hotel context. He used a 7-point likert scale to measure different aspects of competition including price, promotion, service quality, and service variety. This research adopt the same construct that was used by Lamminmaki [43]. In question B2, respondents were asked to indicate the intensity of competition relating to the four aspects using a scale ranging from 1 (not intensive at all) to 5 (extremely intensive). Cronbach Alpha was 0.773 and an overall measure was obtained by calculating the average score of the 4-items. Descriptive statistics for the intensity of competition were: Mean = 2.40, SD = 0.884, minimum = 1, and maximum = 4.

In question A 12, Respondents were asked to indicate the extent of the use of cost system at their hotels for different purposes including:

- (A) Inventory valuation
- (B) Services discontinuation decisions
- (C) Services mix decisions
- (D) Outsourcing decisions
- (E) Determining the cost of services for use in cost-plus pricing
- (F) New services introduction decisions
- (G) Design stage for new services
- (H) Customer profitability analysis
- (I) Cost reduction/cost management
- (J) Acceptance-rejection sales packages from tour-operators
- (K) Budgeting
- (L) Benchmarking
- (M) Business process re-engineering

The likert scale is ranging from 1 (never) to 5 (very often). The items included above were adopted from Innes and Mitchell [41] and were modified to hotel context by Pavlatos and Paggios [9]. A Cronbach Alpha for the 13-items, that were used to measure the use of cost information, was 0.889. Descriptive statistics for the average scores of the 13 items were: Mean = 2.44, SD = 0.989, Minimum = 1, and Maximum = 4.

Respondents were asked to indicate the level of quality of their hotel among three levels: 5-stars, 4-stars and 3-stars. Table 1 showed the classification of respondents according to the hotel quality level.

The cost accounting literature suggested different measures for different aspects of the level of sophistication of cost system. Early measurement of sophistication focused only on whether or not a company adopted ABC and stages of implementation [2]. Recently, different aspects were used to measure the level of sophistication of cost system. An initial step in measuring the sophistication is whether the cost system involves the allocation of indirect costs. For example, Schoute [6] argued that a major issue in the design of cost system is whether to use absorption costing or direct (i.e. variable) costing. Under direct (variable) costing, only direct costs are assigned to cost objects; however, direct and indirect costs are assigned to cost object under absorption costing. Another important issue in the design of cost system is whether to use traditional cost allocation method or activity-based costing (ABC). Both methods involve two stages cost allocation. In the first stage homogeneous costs of resources are collected in cost pools which are based on departments under traditional cost allocation or based on activities under ABC. The second stage involves the assignment of costs from cost pools to cost objects using different cost allocation bases. Allocation bases may be volume-based allocation bases or non-volume allocation bases (or hierarchical allocation bases in terms of batch-level, unit-level, product-sustaining and facility-related). It is widely

recognized that volume-based allocation bases are used under traditional cost allocation method; however, hierarchical (non volume based) allocation bases are used under ABC.

Abernethy, Lillis [3] focused on three dimensions: (1) the number of cost pools (single versus multiple cost pools), (2) the nature of cost pools (responsibility-based versus activity-based cost pools), and (3) nature of cost allocation bases (volume-based versus hierarchical cost allocation bases). Based on the three dimensions, a continuum of cost system sophistication has been established, with one end of the continuum representing a simple traditional cost system (i.e. single cost pool, responsibility or departmental cost pool, and a volume-based cost allocation base) and the other end representing a sophisticated cost system (i.e. multiple cost pools, activity-based cost pools, and hierarchical cost allocation bases).

Drury and Tayles [7] used the three factors for the sophistication of cost system design; they were: (1) the number of cost pools, (2) the number of different types of second stage cost drivers, and (3) the nature of the cost drivers (transaction, duration or intensity). They used the three factors to distinguish between the low level of complexity and high level of complexity in a continuum. For the first factor (i.e. the number of cost pool), a single cost pool and a single volume-based cost driver were used in the low level of sophistication (i.e. low level of complexity); however, many cost pools in the first stage of the two stages overhead allocation and/or many different types of second stage cost drivers were used in the high level of sophistication. For the second factor (i.e. the number of different types of second stage cost drivers), they suggested that cause-and-effect drivers associated with using many different types of cost drivers including different types of drivers within each of the volume-related, batch-related, and product sustaining activities were features of a complex cost system (i.e. high level of sophistication). This implies on the low level of sophistication cause-and-effect drivers and different types of drivers were not used. The last factor (i.e. the nature of the cost drivers), the least complex cost system in the continuum used transaction driver that were based on the number of times activities were performed; however, in a more complex cost system, duration drivers were based on the amount of time required to perform an activity. A unique feature of the most complex cost system was the use of intensity drivers based on directly charging for the resources used each time an activity was performed.

Pizzini [8] examined the association between four attributes of cost system design on the perception of managers' of relevance and usefulness of cost data and on the actual financial performance using a sample of 277 US hospitals. The first attribute was the level of details including customized reports to users' specifications, analyze costs by payer, contract, physician, procedure, diem, and patient. The second attribute was the ability to disaggregate cost according to behavior including classifying costs into direct/indirect, controllable/non-controllable, tracking fixed/variable costs, and estimating costs. The third attribute was the frequency of reporting including the frequency of reporting to different hospitals levels such as senior managers, middle managers, clinical managers, nursing staff and medical staff. The final attributes (i.e. the fourth) was the extent to which variances were calculated including efficiency, case mix and price variances. Actual performance was measures using four measures including profit margin, cash flow, administrative expenses and expenses per admission. The results indicated that managers' perceptions of the relevance and usefulness of cost data were positively associated with the level of cost details, the ability to disaggregate costs according to behavior, the frequency of reporting. Furthermore, the level of cost details was associated with financial performance measures including operating margin, cash flow and administrative expenses. No association was found between cost system design and operating expenses per admission.

Al-Omiri and Drury [1] used four different measures for the sophistication of cost system. The first measure was to classify cost system in terms of ABC into ABC adopters (i.e. sophisticated cost system) and non-ABC adopters (i.e. non-sophistication cost system). The second measure was the number of cost pools/centers that were used in the first stage of the two stages of cost allocation. The third measure was the number of different types of overhead allocation bases that were used in the second stage of the two stages cost allocation. The final measure (i.e. the fourth measure) was the use of direct or absorption costing system. Respondents were asked to specify whether or not they assigned indirect costs to products/services.

Brierley [5] examined the different definitions of the sophistication of cost system. Data was collected from a questionnaire and field study interview from British management accounts. The results indicated that there were three main definition of sophistication including: (1) the allocation of indirect costs to products, (2) the inclusion of all costs in the product costs, and (3) the understandability of product costs by non-accountants. This implies that the sophistication of cost system could be measured using different attributes.

Pavlatos and Paggios [9] used different attributed of cost system including: accuracy, detail, classification, frequency and variances. Detail focuses on providing cost information at different levels of detail (per room, customer, room night, individual services and tour operator/ travel agent). Classification measures the ability to classify costs according to their behavior (fixed/variable, direct/indirect costs, controllable/non-controllable costs). Frequency of reporting was used to judge the distribution of cost information to managers (daily, weekly, monthly, quarterly, semi-annually and annually). Variance measures the number of variances calculated including efficiency, price and mix variances.

Schoute [6] used two measures for the complexity of costs system. The first measure was the number of cost pools and cost allocation bases used in their firms. The second measure focuses on the nature of cost pools (i.e. functionally oriented (e.g. departmental) or a process oriented (e.g. activity) cost pools) and the type of cost allocation used in cost systems (i.e. unit-level, batch-level, and product-sustaining allocation bases).

Based on the above literature, it is clearly observed that there are different attributes of a cost system that could be used in order to judge the sophistication. According to Brierley [5], previous research had conceptualized sophistication using too narrowly by focusing on the allocation of indirect costs to product; therefore, previous research may be narrow and incomplete. He questioned previous research and realized the need to examine different aspects of sophistication. Also, International Federation of Accountants [52] issued information paper that includes suggested measurements of 12 costing levels ranging from Blind and intensive (level 1), that focus on external financial reporting, to the highest level (level 12) which uses simulations in estimating (a) the level of resources expense, and (b) the total and unit costs of the processes and outputs that consume the resources. Several attributes are suggested to distinguish the 12 costing levels including: (1) the use of direct costing without overhead, (2) direct expenses plus one, or a few, indirect expense pool allocation, (3) the adoption of ABC, (4) the use of multiple-stage activity-based costing, (5) reporting of customer profitability, (6) the adoption of standard costing with estimated unused capacity, (7) the adoption of activity-based resource planning (ABRP), (8) the adoption of Time-driven activity-based costing (TDABC), (9) the use of resources consumption accounting (RCA), and (10) the use of simulation

in estimating the level of resources expenses and the total and units costs of the processes and outputs that consume the resources.

Based on the literature and IFAC [52], the following dichotomous variables were used (Question A 2 to A12):

1. Allocation of indirect costs/overhead to services.
2. Whether or not the hotel adopts ABC
3. In the first stage cost allocation, a single cost pool or many cost pools are used
4. In the second stage cost allocation, a single allocation base or different allocation bases are used.
5. The nature of cost allocation bases in terms of:
 - (a) A single volume-based or different types of volume and non-volume based second stage cost drivers are used.
 - (b) Whether or not the selection of allocation base reflects cause and effect relationships
6. Whether or not cost system adopt each of the following:
 - (a) Multiple-stage activity-based costing
 - (b) Standards costing with estimated unused capacity
 - (c) Customer profitability planning (i.e. customer is the final cost object)
 - (d) Activity-based resource planning (ABRP)
 - (e) Time-driven activity-based costing (TDABC)
 - (f) Resources consumption accounting (RCA)
 - (g) Simulation in estimating: (1) the level of resources costs, and (2) the total and unit costs of outputs that consume resources.
7. Whether or not cost system provides cost information per:
 - (a) Room
 - (b) Guest
 - (c) Room night
 - (d) Individual service
 - (e) Travel agent
8. Whether the cost system involves a classification of costs into:
 - (a) Fixed/Variable
 - (b) Direct/indirect costs
 - (c) Controllable/non-controllable

9. Whether or not the cost system reports information on the following time horizons:
 - (a) Daily
 - (b) Weekly
 - (c) Monthly
 - (d) Quarterly
 - (e) Semi-annually
 - (f) Annually
10. Whether or not cost system reports each of the following variances:
 - (a) Efficiency variance
 - (b) Price variance
 - (c) Mix variance

The measurement of overall level of sophistication was obtained by the sum of the total scores for all the questions. The codification was 1 for Yes and 0 for No. For question relating to the first stage cost allocation, 1 is donated for many cost pool and 0 for a single cost pool. Similarly, single cost allocation base donated 0 and different allocation bases donated 1. Also, a single volume-based cost driver is donated 0 and multiple volume and non-volume based cost drivers is donated 1.

Tables 3 shows descriptive statistics for the items that were used to measure the level of sophistication of cost system. 36 (87.8%) of the respondents allocated indirect costs (overhead) to services; however, 5 (12.2%) of the respondents did not allocated indirect costs to service. Respondents were asked to go to the next section if they did not allocate indirect costs to services; Therefore, the remaining questions in this section were answered by 36 respondents.

19 (52.8%) of the respondents adopt ABC and 17 (47.2%) of the respondents did not adopt ABC. In the first stage cost allocation, 11 (30.6%) of the respondents used a single cost pools and 25 (69.4%) of the respondents used many cost pools to allocate indirect costs. In the second stage cost allocation, 6 (16.7%) of respondents use a single cost allocation base and 25 (69.4%) of respondents use many cost allocation bases to allocate the costs of cost pools to services/products. With regards to the nature of cost allocation base, 14 (38.9%) of respondents use a single volume-based cost driver and 22 (61.1%) of respondents use many cost allocation bases are used to allocate the costs of cost pools to services/products. 17 (47.2%) of respondents use cost allocation bases that reflect the cause-and-effect relationship. Multiple stage ABC is used by 6 (16.7%) of the respondents. 16 (44.4%) of the respondents use standard costing. 12 (33.3%) respondents use customer profitability. Activity-based resource planning (ABRP) is adopted by 13 (36.1%) of the respondents. Time driven ABC is adopted by 25 (69.4%) of the respondents. 16 (44.4%) of the respondents use Resources consumption accounting (RCA). The use of simulation in estimating the level of resources costs, and the total and unit costs of outputs that consume resources are 27 (75%) and 22 (61.6%) of the respondents respectively. The reporting of cost information varies among hotels. Cost information is reported per room, customer, room/night, individual service, and travel agent by 30 (83.3%), 29 (80.6%), 31 (86.1%), 3 (8.3%), and 26 (72.2%) of the respondents respectively. The classification of costs

into fixed/variable is used by 9 (25%) of respondents, direct/indirect by 11 (30.6%) of the respondents, and controllable/non-controllable by only 2 (5.6%) of the respondents. The results indicate that cost information is reported annually by 35 (97.2%) of the respondents, daily by 29 (8.6%), weekly by 20 (55.6%), monthly by 14 (38.9%), quarterly by 13 (33.3%), semi-annually by 20 (55.6%) and annually by 35 (97.2%). Reporting cost variances are less used by hotels. The results indicate that efficiency, price, and mix variances are reported by 12 (33.3%), 13 (36.1%), and 4 (11.1%) of the respondents respectively.

5. RESEARCH FINDINGS

In order to test the hypotheses regression model was applied in respect of the level of sophistication of cost system in hotel. Overall model was found to be significant ($F = 35.297$; $p = .000$). R is the coefficient of determination that represents the correlation between all independent variables and the level of sophistication of cost system (i.e. dependent variables).

R square is .860 that represents the proportion of variance in dependent variable (the level of sophistication of cost system) that should be explained by independent variable. Adjusted R square is an estimate of how well the model would fit another data set from the same population. Adjusted R square is .837 that represents independent variables are explaining 83.7% of the variations in the level of sophistication of cost system.

As this research includes 6 independent variables, it seems necessary to test whether there is correlation among these variables. Many researchers [53-56] argued that the collinearity problem can be detected by examining the correlation among the independent variables. A general rule is that if there are correlation coefficients of .8 or more a collinearity problem exists. Following this argument, the correlation coefficients among pairs of independent variables were calculated. The results indicate that all the coefficients are less than .8. This indicates the problem of collinearity is not an issue. Another method of detecting collinearity is to use the variance inflation factor (VIF) and tolerance. The tolerance is a measure for the extent to which an independent variable cannot be predicted by other independent variables. It is computed as $1 - R$ Square; where the variable being considered is used as the dependent variable and all other variables are used as independent variables ([56]). The variance inflation factor (VIF) is the counterpart of the tolerance. The VIF is computed as being $1/\text{tolerance}$. According to [57] and Miles and Shevlin [56], the tolerance ranges from 0 to 1. A tolerance of 0 for a variable indicates that it is completely predictable from the other independent variables and that therefore there is a problem of multicollinearity. If a variable has a tolerance of 1, this means that the variable is completely uncorrelated with other independent variables and that there is no problem of collinearity. On the other hand, many writers [58, 59]. Montgomery, Peck [59] argued that VIFs of greater than 10 are often. The results indicate that VIFs are less than 10 and tolerances are more than zero.

The results of the regression model indicated that there is a significant relationship between the level of sophistication of cost system, intensity of completion ($\text{Beta} = .159$, $t = 2.211$, $p = .034 < 0.05$), the use of cost information ($\text{Beta} = .558$, $t = 4.287$, $p = .000 < 0.01$), and quality level of the hotel ($\text{Beta} = .212$, $t = 2.672$, $p = .011 < 0.05$). There was no significant relationship between the level of sophistication of cost, cost structure ($\text{Beta} = .187$, $t = 1.6561$, $p = 0.106$), degree of decentralization ($\text{Beta} = .052$, $t = .780$, $p = 0.440$), and size of the hotel ($\text{Beta} = .098$, $t = 1.242$, $p = 0.223$).

6. DISCUSSION AND CONCLUSIONS

Prior research relating to the design of costs system had used different measures for the level of sophistication. A unique feature of this study is to use an overall measure for the level of sophistication of cost system that encompass different dimensions including: the allocation of indirect costs (overhead) to services, the adoption and non –adoption of ABC, a single cost pools or many cost pools are used in the first stage cost allocation, a single cost allocation base or many cost allocation bases are used in the second stage cost allocation, a single volume-bases or different type of volume and non-volume based second stage cost allocation, whether or not the selection of cost allocation base reflects cause and effect relationships, whether or not multiple-stage , standards costing, customer profitability, activity-based resources planning (ABRP) is adopted, time-driven ABC (TDABC), resources consumption accounting (RCA), and simulation are adopted, whether or not cost system provides information per room, guest, room/night, individual service and travel agent, whether or not costs are classified into: variable/fixed, direct/indirect, and controllable/non-controllable, whether or not cost system reports information on different time horizons including daily, weekly, monthly, quarterly, semi-annually, and annually, and whether or not cost system reports efficiency, price and mix variances.

Statistical analysis was used to test for the 6 hypotheses relating to the contextual factors influencing the level of sophistication of cost system. Evidence was presented to support the acceptance of three of the six hypotheses presented. The intensity of competition, the use of cost information, and the quality level of the hotel were significant variables of the level of sophistication of cost system. However, cost structure, degree of decentralization , and the size of the hotel were not significant variables for the level of sophistication of cost system. It is possible that the measurement of hotel size by the number of rooms is too simplistic measure. Nevertheless, prior research used the number of rooms as the measure of size of the hotel. Also, the results indicate that there is a significant relationship between the level of sophistication and the performance of the hotel. Therefore, enhancing the sophistication of cost system will be positively reflected on the performance of the hotel.

This research provides empirical evidence relating to the factors influencing the level of sophistication of cost system in Hotels in Kingdom of Bahrain. Future research should consider other important variables that may influence the level of cost sophistication in hotels. For example, previous literature [42, 60] argued that product diversity leads to higher potential for cost distortion when products consume activity resources in different proportions; therefore, as product diversity increases, the need for more sophisticated cost system increases to capture the variation in resource consumption by different products. In the same line of argument, Pavlatos and Paggios [9] argued that there is a relationship between the number of services and products and the level of sophistication of cost system. Therefore, future research may examine whether there is a relationship between number of services and products and the level of sophistication of cost system. Another potential factor for future research is the membership of multinational chain. According to Lawrence [61], firms that are member in multinational chain are more likely to achieve higher performance. This implies that firms that are member of multinational chain would have resources to adopt more sophisticated cost system. Therefore, future research may examine whether there is a relationship between membership of multinational chain and the level of sophistication of cost system. Furthermore, future research may examine the relationship between different factors-including top management support, degree of satisfaction of existing cost system, quality of information

technology and the adoption of innovated techniques at organization- and the level of sophistication of cost system.

According to Abernethy, Lillis [3], case study had revealed that the measurement of variables through questionnaire may not capture the essence of the variables. Therefore, case studies should be undertaken in hotels to explore the level of sophistication of cost systems in hotels. Also, future research should consider the relative importance attached to each dimension of sophistication included in this study. Furthermore, the direct and indirect relationship between the contextual and the level of sophistication should be examined by future research.

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