A survey of factors influencing the cost system design in hotels

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ABSTRACT

This study examines the relationship between cost system functionality and contingent factors in the hospitality industry. An empirical survey via questionnaires was conducted on a sample of 100 leading hotels enterprises in Greece. Data analysis showed that the majority of hotels' cost systems do not provide qualitative cost data. Results indicate that the level of cost system functionality is significant positively associated with the low cost strategy and the extent of the use of cost data (USD). No association was found between cost system design and size, level of competition, number of services variants and hotels' management status.

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1. Introduction

Evidence about cost accounting and its use in tourism enterprises and especially in hotels is rather limited (Pellinen, 2003). However, there is an active interest in hospitality management and particularly in cost and management accounting practices of hotels and tourism enterprises (Harris and Brown, 1998). Potter and Schmidgall (1999) assume that little innovation has occurred in hospitality cost and management accounting practices and there are many issues that deserve research attention. However, in recent years, important empirical research in management accounting for hotels and tourism has been published (e.g., Harris and Mongiello, 2006).

With the aim of explaining the diversity of management accounting practices researchers have adopted contingency theory to demonstrate how specific aspects of an accounting system are associated with various contextual variables (Emmanuel et al., 1990). The contingency approach to management accounting is based on the premise that there is no universally appropriate accounting system applying equally to all organizations in all circumstances. Rather, it suggests that the particular features of an appropriate cost accounting system will depend upon the specific circumstances in within an organization. The effectiveness of design of a cost system is depends on its ability to adapt to changes in external circumstances and internal factors. Contingency theory suggests that a firm's strategy, organizational structure, as well as

the environment dictate its choice of a control system (Chenhall, 2003). Any associated benefits or drawbacks are a function of the degree of alignment between the design of a firm's cost system and the specific set of circumstances the firm faces (Chenhall and Morris, 1986). Benefits or drawbacks are not solely attributable to the absolute level of cost system functionality.

Accounting literature identifies at least five critical attributes of the cost system design: the level of detail provided, the ability to disaggregate costs according to behavior, the frequency with which information is reported, the accuracy of cost data, and the extent to which variances are calculated (see Pizzini, 2006 for a review).

The level of detail refers to the system's ability to supply data about cost objects that vary in size from entire divisions to individual products, components, and services. Chenhall and Morris (1986), Kaplan and Norton (1992), and Karmarkar et al. (1990) incorporated level of detail in their characterizations of cost system design. The second characteristic of cost system design, the ability to disaggregate costs according to behavior, closely relates to the first. In order to supply detail, the system must first separate and classify costs according to behavior. The ability to disaggregate costs and classify them according to their behavior is directly associated to the ability to provide useful detailed cost information (Cooper and Kaplan, 1991; Swenson, 1995). Basic cost classifications explored in the literature include fixed/variable costs, direct/indirect costs, and controllable/non-controllable costs (Feltham and Xie, 1994; Johnson, 1992; Karmarkar et al., 1990; Khandwalla, 1972).

Cost-reporting frequency enables managers to appropriately address problems and identify opportunities for improvement (Karmarkar et al., 1990; Simons, 1987). Chenhall and Morris (1986) measured the frequency of cost reports and concluded that more frequent reporting provides managers with feedback on decisions

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and information on recent events. This can be used to guide future courses of action. The forth characteristic of cost system design, is the accuracy of cost data. Inaccurate cost accounting information is not relevant or useful for decision-making (Copper and Kaplan, 1992). Designers of cost systems have to develop a system that leads to the most accurate information possible. More accurate product cost can be obtained by the use of such systems, which trace cost directly from supports activities to products/services.

Finally, variance analysis highlights differences between budgeted and actual outcomes and seeks to explain such differences (Karmarkar et al., 1990; Simons, 1987). Proponents of variances analysis argue that the specific theory aids managerial decision-making by identifying corrective managerial action (Johnson and Kaplan, 1987).

According to Pizzini (2006) more functional cost systems are those that: provide greater detail, better classify costs according to behavior, report cost information more frequently, provide accurate cost data to a great extent, and calculate more variances. More functional or refined cost systems produce "better" (i.e., more relevant and useful) data that enhance managerial decision-making, and thereby lead to improved economic performance (e.g., Cooper and Kaplan, 1991; Johnson, 1992). Cost system functionality is defined as the quality of cost accounting information which is provided by a cost system.

This study investigates associations between cost system design and contingent factors in the hospitality industry using a sample of 100 hotels in Greece.

The remainder of the paper is organized as follows. The next section briefly set out the review of the literature. The research hypotheses are presented in Section 3. Section 4 analyzes the research methodology. The fifth section presents the survey results. Conclusions, limitations and implications for future research are presented in the final section.

2. Literature review

Studies in cost and management accounting applied in the lodging industry have been conducted both in tourism management, as well as accounting. They cover various aspects on tourism industry. Apparently, however, most of the studies have focused on hotels (Harris and Brown, 1998). Aforementioned research covers the whole field of cost and management accounting.

As far as hotels are concerned, there are studies on cost structure and cost systems. Brignall (1997) concludes that most hotels have a high proportion of fixed cost with approximately three-quarters of the total cost of a hotel being fixed and uncontrollable. Dunn and Brooks (1990), Noone and Griffin (1999) and Harris and Krakhmal (2008) implement customer profitability analysis (CPA) with the use of activity based costing (ABC). However, the use of ABC in the hotel industry is limited (Tai, 2000) to an informal survey by Graham (quoted in Tai, 2000).

Pellinen (2003) reports on a field study of pricing practices and their relationship to cost accounting in tourism enterprises located in Finnish Lapland. The results of the study suggest that only the companies with the strongest competitive position are able to use absorption pricing. Furthermore, as the majority of the studied enterprises take the prices from the leading enterprises, the actual importance of cost accounting is rather limited.

Schmidgall and Ninemeier (1987) studied operation budgeting practices on hotel chains in US focusing on coordination and control. The chains surveyed included the 47 largest lodging chains in the United States. They concluded that the majority of the hotels used a bottom-up approach to budgeting and also reported on variance tolerations. Moreover, Schmidgall et al. (1996) compared operations budgeting practices of lodging firms in the United

States with those in Scandinavia. A majority of hotel chains in both the U.S. and Scandinavia use a bottom-up approach to budgeting.

Collier and Gregory (1995), explore the use of strategic management accounting in the hotel sector through case studies at six major UK hotel groups. The results demonstrate that the accounting function in hotel groups is becoming increasingly involved in strategic management accounting, both in planning and in ad hoc exercises on the market conditions and competitor analysis. The widespread adoption of strategic management accounting is consistent with the open and relatively homogeneous nature of the industry and the high degree of competitiveness among the hotel groups in the market.

The development of uniform accounting systems (and uniform costing systems) is by no means a recent trend. For many years a significant hospitality accounting development has been the publication of uniform accounting systems for the key sector of the industry, notably hotels, restaurants and clubs in the United States, while their first appearance for hotels traces back to 1926. The Uniform System of Accounts for the Lodging Industry (USALI), now in 10th edition, has become the industry standard, particularly for the large hotel businesses and international and global chains in Europe and US (Harris and Brown, 1998). It relates effectively to the operating characteristics of hotels and it is based on departmental accounting principles, reflecting the fact that rooms, food and beverage and other services are produced in departments rather than in production lines, as in the case of manufactured products.

Haktanir and Harris (2005) mention that the context of the business is one of the essential elements of performance management systems. Thereby, performance management systems should vary with organizations operating in different environments, particularly in different business districts. Owners and operators involved in different businesses activities may experience differences in local cultures, lifestyles, and needs of customers. In order to remain competitive, continuous improvements on existing products and introductions of new products and services to provide localized services are important. Thus, new opportunities and businesses are consistently emerging from the market.

Moreover, Parkan (1996) remarks that reliable performance evaluation enhances control and fosters improvement of hotel operations. The evaluation results could pinpoint areas of the operation that need improvement and support in both short- and long-term management decision-making (Parkan, 1996; Mia and Patier, 2001). Therefore, having a performance measuring system that can fully reflect the business situation in reality is imperative to a business, as it may affect subsequent decisions of the organization and in the worse case, losing its competitive advantages (Phillips, 1999).

Burgess (2006) notes that laterally, hotel groups have outsourced (to an external provider) or else centralised (in-sourcing), so that there is less perceived need for unit-based management of the control and finance processes, with more regionally or centrally based financial management. Technology has speeded up accounting functions; many basic tasks have become automated and routine and providing that systems are effective and rigorous, may not need to be performed within the operating unit. This has resulted in a division of accounting into processing data to produce reports and analysis and planning, the so-called financial management task. The main drawback of outsourcing accounting is a reduction in on-site control, but it frees up the time of finance staff and within the unit, the controller moves from being a "number cruncher" to being more of a business advisor. In terms of skills, this changing role will mean that financial managers will need to develop further their business skills in analysis and problem solving, rather than just being providers of information. The increased use of technology to improve systems means that the skills need of the regionally based

controller may be different from the one based within a unit and managing self-accounting systems.

Mia and Patier (2001) investigate the use of management accounting systems by general managers and department managers in luxury hotels. The results indicate that general managers and department managers make equal use of management accounting systems (MAS) for both short- and long-term decisions. However, a detail analysis of the data by manager groups indicates that general managers differ from department managers with respect to their use of MAS for making decisions. Furthermore, general managers, compared to department managers, are found to be more satisfied with the frequency in which MAS is available to them. As far as the department managers' performance evaluations by general managers is concerned, the results reveal that general managers put more emphasis on financial than on non-financial performance indicators.

Pizzini (2006) examines the association between cost system functionality, managers' beliefs about the relevance and usefulness of cost data, and actual financial performance using a sample of 277 US hospitals. Results indicate that managers' evaluations of the relevance and usefulness of cost data are positively correlated with the extent to which systems can provide greater cost detail, better classify costs according to behavior, and report cost information more frequently. However, only the ability to supply cost detail is favorably associated with measures of financial performance, including operating margin, cash flow, and administrative expense. Interestingly, cost system design was not associated with operating expense per admission, suggesting that accounting information had not yet been successfully used to manage clinical costs.

According to Hill (2001), Hill and Johns (1994) and Lawrence (1990) hospital cost system design was found to vary systematically with strategy and structural variables including case mix, teaching affiliation, size, and whether a hospital is a member of a multi-hospital system. Prior studies report positive associations between these determinants and cost system functionality. Hospitals pursuing a differentiation strategy are expected to focus resources on clinical care to the detriment of administrative systems, such as the cost system. Conversely, hospitals that emphasize on cost control will have more functional cost systems because managers will require more information for monitoring costs. Larger hospitals and system hospitals will benefit greatly from functional cost systems because they can potentially spread the fixed costs of system development over more beds.

Moreover, a firm's external environment has been found to influence cost system design in the hospital and other industries. Hospitals that operate in markets with strong competition and/or significant penetration from managed care organizations (MCOs) face greater external pressure to control costs and therefore require more extensive and detailed cost information (Hill, 2001).

In view of the above, it is obvious that there is little empirical research in management accounting systems and no evidence linking internal, organizational factors and external factors to control-system design in the hospitality industry, like those which have been accomplished to other service industries (i.e., hospitals). Chenhall (2003) reports that there is a need for more research into service industries about cost system design and contextual variable, as these entities become increasingly important within most economies.

3. Research hypotheses

3.1. Extent of the use of cost data

The scope of a cost system is expressed in terms of its use in order to support strategic and operational decision needs. Brinker (1992) discusses cost system scope in terms of coordinating a set of activities that are necessary for meeting customer demands in addition to maintaining an organization's own economic viability. Cooper and Kaplan (1991) also identify such activities as those required for product pricing, product design, budgeting, process improvements, while also meeting traditional performance measurement and evaluation needs. The coordination of these activities delivers information that support strategic and operational decisions and therefore assists in the implementation of strategy relating to those decisions. Cost system scope is an important concept that reflects the use of cost information in a number of decision areas or activities of the organization (Nicolaou, 2001). Analytical models of single-firm settings find that more detailed, accurate and frequent cost data are more useful in decision-making. Chenhall (2003) reports that the cost system design is associated with the need for information that its users have. Thus, the following hypothesis is tested:

H1. There is a positive association between the extent of use of cost data and the cost system functionality.

3.2. Low cost strategy

Using Porter's framework (1980, 1985), strategy can be measured along two dimensions: product differentiation and low-cost production. Contingency theory suggests that a firm's strategy, its choice of control system (Chenhall, 2003). Product differentiation companies use management accounting systems extensively; this enhances companies' ability to differentiate their products and to satisfy their customers (Chenhall and Langfield-Smith, 1998). On the other hand, low cost strategies are growingly using management accounting systems with the purpose of enhancing companies' ability to control costs (Chenhall and Langfield-Smith, 1998; Johnson and Kaplan, 1987). However, it has been suggested that highly sophisticated systems are suitable for companies that adopt low cost strategy (Chenhall and Langfield-Smith, 1998). The following hypothesis is therefore tested:

H2. There is a positive association between the low cost strategy and the cost system functionality.

3.3. Level of competition

As early as 1972, Khandwalla found that output market competition is associated with greater use of management controls. More recently, Mia and Clarke (1999) argued that Management Accounting Systems (MAS) provide information, which is used to identify, evaluate and implement appropriate strategies and found that level of competition is determinant of the use of MAS. As competition increases, there is a greater chance that a competitor will exploit any costing errors made. In addition, research has shown that non-competitive situations can lead optimal, strategic costing systems that have more in common with traditional costing systems than with sophisticated costing systems (Alles, 1990). Thus, more accurate, timeliness and detailed cost information maybe needed as competition increases (Cooper, 1988). Based on the above discussion the following hypothesis is tested:

H3. There is a positive association between the level of competition and the cost system functionality.

3.4. Size

The most common internal factor that has been examined in relation to management accounting is organizational size (Khand-

walla, 1972). As organizations become larger, the need for managers to handle greater quantities and quality of information increases to a point, where they have to institute controls, such as rules, documentation, specialization of roles and functions, extended hierarchies and greater decentralization down to hierarchical structures (Child and Mansfield, 1972). Khandwalla (1972) found that large firms were more diversified in product lines, as well as more divisionalized and employed mass production techniques and more sophisticated controls. Therefore, the following hypothesis is tested:

H4. There is a positive association between the company's size and the cost system functionality.

3.5. Number of services variants

Product diversity is argued to be the major factor causing product cost distortions in conventional costing systems. This includes production volume diversity, size diversity, complexity diversity, material diversity and set-up diversity (Cooper, 1988). Greater product diversity requires more sophisticated cost systems to capture the variation in resource consumption by different products (Malmi, 1999). As diversity increases, so does the need for cost information (Karmarkar et al., 1990). Based on the above discussion the following hypothesis is formulated:

H5. There is a positive association between the number of services and products and the cost system functionality.

3.6. Membership of multinational chain

Prior studies have found positive associations between structural determinants and cost system functionality (Pizzini, 2006; Hill, 2001) in hospitals. One of these structural variables is the hotel membership. Lawrence (1990) argues that firms that are members in multinational chains are more likely to attain higher performance. This is attributed to the fact that they can attract more capable managers, share knowledge across facilities, negotiate shared purchase agreements with suppliers, obtain quantity discounts, and negotiate more favorable labor contracts. Such enterprises will probably need more functional cost systems, which provide qualitative cost data. Therefore, the following hypothesis is tested:

H6. There is a positive association between the membership of multinational chain and the cost system functionality.

4. Research methodology

In order to test the aforementioned hypotheses qualitative or/ and quantitative methods can be used. For the purpose of investigating those factors affecting the cost system functionality in the presented study, a questionnaire was used. The advantages of the questionnaire technique are that it allows information to be collected from a large number of people and the findings can be expressed in numerical terms while semi-structured interviews can allow issues to be explored in greater depth (Veal, 1997).

With a deductive approach in contingency-based management accounting research, it is possible to test a theory, explain relations between variables, as well as generalize conclusions (Gerdin and Greve, 2004).

4.1. Sample characteristics and data collection

The sample surveyed included the leading Greek hotel enterprises. The criteria used for the selection of the hotels were

their sales revenues, as well as their net profit for the year 2003, selected from the ICAP's Directory 2002 (Gallup's subsidiary in Greece).

The research was realized in two phases. In the first phase a participation form was sent to the selected companies accompanied by a cover letter, which included a brief reference of the main goals of the study. Financial managers were asked to indicate the type(s) of cost and management accounting practice(s) used by their hotels, as well as to state correspondence information in order to address the survey questionnaire, in case they were interested. In the second phase of the research, the survey questionnaire was designed and sent to the sampled hotels. Before the finalization of the questionnaire, a pilot test took place. More specifically, interviews were conducted with four Chief Accountants who had a long experience in cost and management accounting practices in order to make sure that the questionnaires' content was easy to understand. This testing enabled us to account for omissions or vagueness in the expressions used to formulate the questions.

The participation form was sent to 196 hotel companies; 112 firms responded positively in the first phase of the survey (57% response rate). Respondents were asked to complete the questionnaire from the perspective of the firm where they were employed. Companies that did not express interest in the research replied that the main reasons for not taking part in the survey were the lack of time and the fact that answering questionnaires was not one of their top priorities. Following, the questionnaire was sent to those hotels that completed the participation forms. 100 completed questionnaires were finally received during the second phase of the survey. The response rate was 51%. The questionnaires were answered at a percentage of 96% by executives in the top hierarchy of the financial departments (financial managers and chief accountants), who have firm knowledge of the cost and management accounting information used within their companies. Thus, we believe the answers to be reliable.

The financial, geographical and company characteristics for the final sample of hotel enterprises are shown in Tables 1 and 4.

Table 1
Category, geographical area, number of beds, management status and type of hotels that participated in the survey.

	%
Categories (N = 100)	
5 stars	34
4 stars	58
3 stars	8
Geographical area (N = 100)	
Athens	17
Crete	30
Aegean islands	27
Ionian islands	10
Macedonia	9
Other	7
No. of beds (N = 100)	
Up to 300	8
300–350	10
350–500	13
Over 500	69
Company management status (N = 100)	
Private company	53
Member of national chain	30
Member of multinational chain	17
Type of hotel (N = 100)	
Resort	45
City hotel	54

Table 2
Factor analysis of the extent of use of cost data.

Items	Factor 1: Extent of use of cost data (Loadings)
Service pricing	0.868
Customer profitability analysis	0.875
Service mix	0.832
Performance evaluation	0.864
Budgeting	0.798
Output	0.834
Cost reduction	0.905
Service design	0.812
Acceptance–rejection sales packages from tour-operators	0.892
Benchmarking	0.834
Business process re-engineering	0.824
	0.736
Eigen value	9.34
Percent of variance	85.7

Table 3
Descriptive statistics of the variables in the study.

Variable	N	Mean	Std. Deviation	Actual minimum	Actual maximum
Extent of use of cost data	100	29.9	9.12	13	53
Low cost strategy	100	12.31	3.97	5	25
Size (€ mil)	100	9.2	11.4	3.2	99
Level of competition	100	3.42	0.97	2	5
Number of services variants	100	8.12	3.54	3	17

4.2. Survey instrument and measurements

The extent of use of cost data (USE) was measured using an instrument developed on this study and based on the literature. It comprises of an eleven-item five-point Likert-scaled instrument anchored by (1) "to no extent" and (5) "to a great extent". Respondents were asked to indicate the extent of the use of cost data on the aforementioned scale. A factor analysis shown in Table 2 revealed that all eleven items were loaded on a single factor. The Cronbach alpha for the five-item measure is 0.90. Descriptive statistics for the instrument are presented in Table 3.

Low cost strategy (COST) was measured using an instrument developed for the purpose of this study and based on the literature. It comprises a five-item five-point Likert-scaled instrument anchored by (1) "to strongly disagree" and (5) "to strongly agree". Respondents were asked to indicate whether their firm is cost oriented. A factor analysis, as shown in Table 4 revealed that all items were loaded on a single factor with an eigenvalue of 4.2 explaining 70.1% of the variance in the underlying variable. The Cronbach alpha of 0.84 suggests that its internal consistency is satisfactory. Table 3 provides descriptive statistics for the measure.

Level of competition (COMP) was measured by Swenson (1995) using a single item five-point Likert scale anchored by (1) "to strongly disagree" and (5) "to strongly agree", where respondents were asked to indicate the price competition their company faces. Size (SIZE) was measured using the log annual sales turnover (€ million). Descriptive statistics for sales are presented in Table 3. Objective data were used for measure the number of services variants (SERV). This variable was adopted from Bjornenak (1997). Descriptive statistics for aforementioned variables are presented in Table 3. Membership of multinational chain (MULT) was measured using a binary variable (1 = member, 0 = otherwise). Descriptive statistics for membership of multinational chain are presented in Table 1.

The survey asked 13 questions relating to cost system attributes using binary (dichotomous) variables. That instrument was developed for this study and based on the literature. These attributes have been classified in 5 categories which are: accuracy, detail, classification, frequency and variance. Detail denotes whether the system accumulates costs at various levels of detail (per room, customer, room night, individual service and tour operator/travel agent). Classify measures the system's classification costs ability according to their behavior (fixed/variable, direct/indirect, controllable/non-controllable cost). Frequency evaluates the frequency with which cost system reports are distributed to managers (daily, weekly, monthly, quarterly, semi-annually and annually). Variance measures the number of variances the cost system calculates (efficiency, price and mix variances) and accuracy measures the cost system's provision of accurate cost data to a great extent. Each factor represents a different dimension of cost system functionality.

Regarding the validity scale measurement that concerns the accuracy of the cost data, which are provided by the cost systems, a proxy variable has been used. The respondents have been asked to record the allocation bases number, which is used by cost systems (Mean value = 2.8, Std. Deviation = 1.8) in allocating costs in revenue departments. According to Cooper and Kaplan (1998), the cost data accuracy is linked to the number of the allocation bases, which are being used. This variable is positively and significantly correlated to the binary variable, which refers to whether the hotel's cost system provides accurate cost data to a high rate ($r = 0.46$, $p \leq 0.01$). Based on this finding, we reach the conclusion that the scale measurement of the binary variable is valid.

Likewise, as regards the scale measurement validity (which concerns the cost reports supply frequency), one more proxy variable has been used that was named timely. This proxy was named timely and is measured (used by Pizzini, 2006) on a single item five-point Likert scale ranging from (1) "to strongly disagree" to (5) "to strongly agree". Respondents were asked to indicate whether they receive cost accounting information from their cost accounting system in a timely manner (in time) (Mean value = 3.1, Std. Deviation = 1.1). Timely is positively and significantly correlated to the binary variable which is reported on a monthly basis in the supply cost reports by the cost system ($r = 0.43$, $p \leq 0.01$).

Table 4
Factor analysis of low cost strategy.

Items	Factor 1: Low cost strategy (Loadings)
The hotel follows a policy oriented to the cost decrease in order to increase its revenues	0.820
The hotel provides services in low cost so as to have a competitive advantage	0.785
The hotel's policy is to provide motives to the departments which manage to reduce their costs	0.812
The increase of the productivity-efficiency is vitally connected with these motives	0.794
The hotel develops cost control programs of its activities	0.834
Eigen value	4.2
Percent of variance	70.1

Table 5
Spearman correlation matrix for the independent variables.

Variable	COMP	USE	CO	SERV	MULTI	SIZE	N
COMP	1						100
USE	0.14	1					100
CO	0.17	0.45[a]	1				100
SERV	−0.17	0.06	0.16	1			100
MULTI	0.21[b]	0.12	0.24[b]	0.11	1		100
SIZE	0.07	0.31[a]	0.26[a]	0.09	0.14	1	100

[a] Indicates correlations is significant at the 0.01 level (2 tailed).
[b] Indicates correlations is significant at the 0.05 level (2 tailed).

Table 6
Factor analysis of low cost strategy and use of data.

Items	Factor 1: Extent of use of cost data (Loadings)	Factor 2: Low cost strategy (Loadings)
Service pricing	0.898	
Customer profitability analysis	0.865	
Service mix	0.895	
Performance evaluation	0.897	
Budgeting	0.795	
Output	0.821	
Cost reduction	0.866	
Service design	0.733	
Acceptance–rejection sales packages from tour-operators	0.846	
Benchmarking	0.785	
Business process re-engineering	0.821	
	0.818	
The hotel follows a policy oriented to the cost decrease in order to increase its revenues		0.781
The hotel provides services in low cost so as to have a competitive advantage		0.814
The hotel's policy is to provide motives to the departments which manage to reduce their costs		0.827
The increase of the productivity-efficiency is vitally connected with these motives		0.792
The hotel develops cost control programs of its activities		0.834
Eigen value	5.14	4.23
Percent of variance	42.8	35.2

Based on this finding, we conclude that the scale measurement of the binary variable is valid as well.

Table 5 provides a correlation matrix of the independent variables in the study. None of the correlation coefficients are high, suggesting that multicollinearity is not an issue. Lewis-Beck (1990) reported that intercorrelations need to be 0.8 or above before they are of any concern. Furthermore, the correlation between low cost strategy and use of data ($r = 0.45$, $p \leq 0.01$) is not sufficient to expect that multicollinearity would affect the results of the research. A rotated varimax factor analysis shows (Table 6) that each predictor loads principally on a separate factor, based on the decision heuristic cut-off of 0.400 providing evidence of their independence. Williams et al. (1990) noted that intercorrelations among variables derived through a factor analysis results from the items comprising any one factor not loading exclusively on that factor. Consequently, they indicated that factor intercorrelations can be greater than zero.

5. Research findings

Data analysis showed that 24 hotel units out of the 100 which participated in the research have adopted more functional cost systems. In contrast, 76% of the sample uses less functional cost systems or simplistic costing systems. In particular, the 24 hotels which took part in the research survey and use more functional cost systems supply cost by individual service, customer, room, tour operator-travel agent, room night; they also classify cost into fixed and variable cost, direct and indirect, controllable and non controllable. These cost system report monthly cost data to their users and calculate efficiency, price and mix variances. In addition, their finance managers believe that the cost accounting information provided by the cost systems is characterized by great extent of accuracy.

On the contrary, the cost systems of the remaining 76 hotels, do not calculate either the cost per cost object or their behavior analytically. The cost accounting information provided by these cost systems is not accurate in great extent and it is reported in an annual basis; they also do not calculate efficiency, price and mix variances.

Regarding the cost systems' attitudes the hotel units have been classified into 2 groups: those that have used a more functional system (this group contains 24 hotels) and those using a less functional system (this group contains 76 hotels). More functional cost system are those that provide greater detail, better classify costs according to behavior, report cost information more frequently, provide accurate cost data to a great extent, and calculate more variances. In order to be classified into the first group, a hotel must have all the attributes of the cost system that have been recorded. In the opposite situation, a hotel unit is classified into the second group (those that use a less functional cost system). Those cost systems do not provide qualitative cost data.

For the purpose of testing the hypothesis specified in Section 3 the following model was applied:

$$Y = b_1 + b_2\ USE + b_3\ COM + b_4\ SIZE + b_5\ COST + b_6\ SERV + b_7\ MULT + e$$

where Y: the dichotomous variable of more functional cost systems and less functional cost systems.

Therefore, binary logistic regression was applied to the 100 hotels that have established formal costing systems. The above model contains 6 independents variables.

Table 7 presents the results of the binary logistic regression. The two finals columns of the table present the collinearity statistics. It can be seen that the variance inflation factors are well below the generally accepted critical threshold of 10 (an indication of high levels of multicollinearity) and tolerances are above 0.2 (represent a more conservative estimate that multicollinearity maybe a problem) (Hair et al., 1998). Table 7 also indicates that the following variables are statistically significant: the extent of the use of cost data ($p < 0.01$) and low cost strategy ($p < 0.01$).

A positive sign for the logistic regression coefficient indicates that the variable is positively related to more functional cost systems whereas a negative sign indicates that as the value of the variable increases, a hotel is less likely to adopt highly functional cost systems (Exp. B shown in the final column of Table 7 is an indicator of the change in odds resulting from a unit change in the indicator. Values greater than 1 indicate that as the predictor increases, the odds of the outcome occurring increase; conversely, a value less than one indicates that as the predictor increases, the odds of the outcome occurring decrease. This is consistent with the signs of the regression coefficients). All of the significant variables listed above are in the direction predicted.

The Chi-square statistics shown in Table 7 is comparable to the overall F-statistics in multiple regression. The model is significant at the 0.000 level. The Hosmer and Lemeshow goodness of fit value (0.695) measures the correspondence of the actual and predicted values of the dependent variable. This statistic tests the hypothesis

Table 7
Logistic regression analysis with the dichotomous variable more/less functional cost systems as the dependent variable ($N = 100$).

Variables	Beta or logistic coefficient	Standard error	p-Value	Exp. B	Collinearity statistics	
					Tolerence	VIF
Extent of the use of cost data	0.094	0.038	0.014	1.098	0.772	1.295
Level of competition	0.615	0.406	0.13	1.849	0.847	1.181
Size (annual log sales in € million)	1.951	1.296	0.132	7.037	0.869	1.151
Low cost strategy	0.301	0.098	0.002	1.351	0.782	1.332
Number of services variants	0.166	0.102	0.105	1.18	0.904	1.106
Member of multinational chain (dummy variable)	1.198	0.841	0.13	1.849	0.887	1.128
Constant	−26.714	9.742	0.006	0		
Chi-square	0					
Hosmer–Lemeshow goodness of fit	0.695					
Durbin Watson	1.723					
Cox and Snell R square	0.394					
Nagelkerke R square	0.551					
Percent correctly classified	87%					

that the observed data are significantly different from the predicted values (Hosmer and Lemeshow, 1989). Thus, a non-significant statistics indicates that the model does not differ significantly from the undeserved data (Hair et al., 1998). Nagelkerke R square (0.55) attempts to quantify the proportion of explained "variation" in the logistic regression model. It is similar in intent to the R square in a linear regression model. The final entry in Table 7 indicates that the model correctly classified 87% of the respondents as more or less functional cost systems users.

6. Discussion and conclusions

This study examines relations between cost system functionality and contingent factors in the hospitality industry using a sample of 100 hotels in Greece. The results indicate that the level of cost system functionality used is low. The majority of cost systems followed by the hotels do not provide quality cost data. Those cost systems do not classify cost based on the hotels' actions; they also do not calculate variances between budgeted and actual outcomes and do not provide detailed cost information per cost object. They provide its users with cost reports in an annual basis and their cost data are not characterized by a great degree of accuracy. These systems provide cost information which is more useful for the published annual financial statements preparation than for decision-making, budgeting, control and performance evaluation. The low level of cost system functionality might be attributed to the fact that hotels have not yet adjusted their cost systems to accommodate the increased information needs created by sweeping environmental changes. This is consistent with claims from the practitioner literature in hospitals and might be valid to the hospitality industry as well.

The Uniform System of Accounts for the Lodging Industry (USALI) as a worldwide standard cost system uses descriptors that are comprehensible to all types of stakeholders. It indicates how the hotels can provide qualitative cost data that can be used for decision-making, budgeting, budgetary control and performance evaluation. Chan and Wong (2007) remarked the usefulness and comprehensiveness of USALI. However, Pavlatos and Paggios (2007) in their survey in 85 leading hotel enterprises in Greece revealed that only a few of those hotels use the USALI. This may support our findings that the majority of the Greek hotels enterprises cost systems do not provide qualitative cost data.

Evidence was presented to support the acceptance of two of the six hypotheses made earlier in this work. The level of cost system functionality is significant positively associated with the low cost strategy. More specifically, the survey results demonstrate that hotels emphasizing on cost control and are cost oriented have more functional cost systems; this is attributed to the fact that

managers require qualitative cost accounting information for monitoring cost. These hotels follow a certain policy with the aim to decrease cost; they also try to reduce the cost of the provided services without deteriorating their quality, so as to increase occupancy, revenues and profits and thus obtain a competitive advantage. Their policy provides motives to the departments which in turn manage to reduce their costs and the increase of the productivity-efficiency, which is vitally connected with these motives. Furthermore, these hotels try to reduce non-valued activities and develop cost control programs of their activities.

Hill (2001) and Pizzini's (2006) surveys reached similar conclusions for hospitals. These findings are consistent with previous research showing that highly sophisticated systems are suitable for companies that adopt low cost strategy (Chenhall and Langfield-Smith, 1998). Additionally, Chenhall and Langfield-Smith (1998) state that low cost production allows the firm to sell its services at lower price than competitors. Chenhall (2003) argued that low cost strategies are associated with formal performance measurement systems. These systems include objective budget performance targets and are compared to more prospector strategies requiring informal, open management control systems (MCS). These systems are characterized by more subjective long-term controls and interactive use of budgets focused on informal communications.

We also found that the level of cost system functionality is significant positively associated with the extent of the use of cost data. Hotels that use more cost data for pricing decisions, customer profitability analysis (CPA), service mix designs, outsourcing decisions, cost reduction, budgeting, performance evaluation, benchmarking, business process re-engineering use more functional cost systems. Hence, it appears that there is a relation between cost system design and the degree of the use of cost data to plan, control and make decisions.

This confirms the findings appearing in the cost system design literature. Al-Omiri and Drury (2007) report that one of the factors affecting the cost system sophistication is the firm's use of cost data in pricing decisions, cost reduction efforts and the need for special cost studies. Moreover, Nicolaou (2001) reports that cost systems are designed according to the needs about information that their users have. Thus, if the managers of the hotels do not use the cost data in a great extent (which are provided by their cost systems) especially for the decision-making, budgeting and performance evaluation, it is not of great importance to them to be provided with qualitative cost data. Pizzini (2006) argues that the cost of greater functionality is high (consulting, training, and software expenses) and the potential benefits of a more highly functional cost system have be lees than the costs of that system.

Interestingly, structural determinants including size, the level of competition; the number of services variants and whether a hotel is a member of a multinational chain were no significant variables affecting the cost system functionality. In other words, we conclude that there is no relationship between the sales revenues, the intensity of the competitive environment and the number of services variants with the cost system design. These findings are in contrast with prior studies that found positive associations between these determinants and cost system functionality in hospitals (Hill and Johns, 1994; Lawrence, 1990). The lack of significance of those contingent factors is surprising; given that these variables are often presented in the literature affecting the cost system design. It is possible that the questionnaire used too simplistic measures; these measures failed to take into account the precise ways that influence the level of cost system functionality.

The findings are subject to a number of limitations. Cross-sectional studies as this work presented here can establish associations, but not causality. Another factor that may affect these results is the noisiness of the measures. A mail survey prevents an assessment of the survey respondent's actual knowledge of the cost accounting system, although the surveys were mailed to chief financial managers. A mail survey also presents the respondent from effectively clarifying his or her understanding of the questions. Moreover, the data were collected from hotels in Greece, thus, caution is needed in generalizing the results to other countries. Cost system functionality was operationalized as a binary variable. If it was measured as a sum of questions, using Likert scale, the dependent variable would be more useful. Finally, the sample size was small (less than 100 firms) and we could not split it for validation purposes into analysis and holdout samples. The more functional cost systems group contains a little more than the minimum size of 20 observations required for logistic regression (Hair et al., 1998). Thus, we develop the function on the entire sample and then we use the function to classify the same group used to develop the function. This procedure results is an upward bias in the predictive accuracy of the function, but is certainly better than no testing the function at all.

Despite these limitations, this study has important implications for research in hospitality cost and management accounting. The results provide the first empirical evidence of the relation between cost system functionality and contingent factors in the hospitality industry. Future research should consider incorporating other important variables from contingency theory that are likely to influence the level of functionality of cost system design, such as top management support, satisfaction of the existing cost system, quality of information technology, and lack of a perceived need by management accounting function to develop more functional cost systems. Future research can also examine associations between cost system functionality and actual performance in the lodging industry. Finally, the relation between cost system functionality and the use of USALI needs further investigation.

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