The interaction effect of accounting information systems user satisfaction and Activity-Based Costing use on hotel financial performance: Evidence from Greece

Ioannis Diavastis[a,1], Evgenia Anagnostopoulou[a],
Georgios Drogalas[a] and Theofanis Karagiorgos[a]

[a] *University of Macedonia, Greece*

Abstract: The interaction of Information Technology (IT) and contemporary management accounting systems is an emerging research area. This paper aims at exploring the interaction effect of Accounting Information Systems (AIS) user satisfaction and Activity-Based Costing (ABC) use on hotel financial performance. We empirically test the above relationship in Greek hotel industry, because its highly competitive and information-intensive nature is characterized by the necessity for useful and accurate cost accounting information. Using hierarchical regression analysis, results suggest that when ABC use interacts with AIS user satisfaction, hotel financial performance is improved. On the contrary, AIS user satisfaction and ABC use have no significant association with financial performance when they act independently. This study fills a gap in the literature by developing a new framework that combines IS user satisfaction theory (IS Success Model) and contemporary management accounting techniques. Moreover, it underlines the role of AIS user satisfaction as an enabler of ABC. Finally, our findings extend the hospitality accounting literature, since empirical research on ABC is limited in the hotel industry.

---

[1] *Corresponding address:* Ioannis Diavastis, PhD Candidate, Department of Business Administration, University of Macedonia, 156 Egnatia Str., Thessaloniki, Greece, e-mail: diavas@uom.gr

1. Introduction

Hotel industry is generally regarded as an information-intensive sector (Huh *et al.*, 2009; Law & Jogaratnam, 2005) due to the requirement for timely and accurate information from both customers and hotel practitioners (*Melián-González & Bulchand-Giduma*, 2016). Hence, the role of Information Technology (IT) and the effective use of Information Systems (IS) are of great importance for operational success in hotel industry (Wang & Qualls, 2007). Effective use of IS (or else *IS effectiveness*) can be achieved if users are satisfied with the respective system (Gatian, 1994). Along these lines, Ham *et al.* (2005) emphasize the necessity for examining the users' perceptions of hotel IT applications. Therefore, user satisfaction, which is indicated as a surrogate of IS effectiveness (DeLone & McLean, 1992), should be taken under consideration when the relationship of IS and hotel financial performance is examined. In this respect, hotels can improve their performance in terms of enhanced employee and operational productivity, increased repeated stays and decreased costs (Chathoth, 2007; Siguaw *et al.*, 2000).

Moreover, the need for timely and accurate cost accounting information is also essential for hotel financial managers in order to calculate the true cost of services (Patiar, 2016). Activity Based Costing (ABC) has been suggested as one of the most innovative and sophisticated management accounting techniques (Krumwiede, 1998a; Maiga & Jacobs, 2003). In hotel industry, financial managers face a much more uncertain and complex environment in comparison to their colleagues in other business sectors due to the industry's specific characteristics (Winata & Mia, 2005). For this reason, extensive use of management accounting information, which can be obtained through the use of ABC, is required (Mia & Pattiar, 2001). The main claim made for ABC is that its use leads to cost reduction, full control of ongoing performance and financial benefits (Maiga, 2014). Although the majority of empirical research has shown a positive relationship between ABC use and financial performance, this relationship is deemed significant mainly under specific contextual variables.

Our study particularly focuses on Accounting Information Systems (AIS), which are defined as "computer-based systems that process financial information and support decision tasks in the context of coordination and control of organizational activities" (Nicolaou, 2000: 91). The prime objective of AIS is to generate financial and managerial information (Nikolaou, 1999) for decision making optimization, which, in turn, results in the improvement of firm financial performance. AIS can be identified either as conventional information systems such as spreadsheet solutions, or in an integrated manner such as Enterprise Resource Planning (ERP) financial subsystems (Spathis, 2006; Taipaleenmäki & Ikäheimo, 2013).

The interaction effect of accounting information systems user satisfaction and Activity-Based Costing use on hotel financial performance: Evidence from Greece

The aim of this study is to explore the interaction effect of AIS user satisfaction and ABC use on hotel financial performance. Due to the highly competitive and the personalized nature of hotel industry (Mia & Pattiar, 2001), hotel financial managers and chief accountants should be satisfied as users of AIS by getting information that meets their requirements. Furthermore, at the same time, they should obtain relevant and useful costing information by using sophisticated costing systems such as ABC. Hence, we suggest that when AIS user satisfaction interacts with ABC use, hotel financial performance will be improved.

To address our research proposal, we use structured questionnaires with a view to identifying the use of ABC, to measuring AIS user satisfaction and to assessing hotel financial performance. In our study, we rely on self-reported measures of hotel financial performance, as suggested by previous studies (Krumwiede & Charles, 2014; Maiga, 2012; Maiga 2015). As far as these ratings are used for relative rather than absolute analysis and are obtained by respondents of upper organizational level (Van der Stede *et al.*, 2005), they are considered to be reliable while no serious concern for potential leniency bias exists (Perera *et al.*, 1997). This research is conducted in the context of hotel industry in Greece. The selection of the Greek hotel industry as target population for our research is rationalized by the importance of tourism for Greek economy and the intensity of market competition in the specific sector. Tourism forms the main part of Greek economy, contributing more than 16% to the Greek Gross Domestic Product (GDP) and representing 18.3% of total employment (SETE, 2013). Moreover, the Greek hotel industry results in 45% of tourism income (IOBE, 2012), with a total bed capacity of 800 thousands (SETE, 2013).

The importance of contingency theory is underlined in literature (Zhang *et al.*, 2012). As a result, the potential synergies of IT and management accounting are still under investigation. Previous research has empirically tested how IT integration (Maiga *et al.*, 2014), IT quality (Krumwiede & Charles, 2014) and IT sophistication (Cagwin & Bouwman, 2002) interact with ABC use on firm's financial performance. However, to the best of our knowledge, no prior study has attempted to examine the synergy effect of AIS user satisfaction and ABC use on financial performance. Therefore, the first contribution of our study is to develop a new framework that integrates IS user satisfaction theory (IS Success Model) and contemporary management accounting literature, providing a great opportunity for further research in this area. Second, despite the increasing economic importance of hotel industry, empirical research related to ABC in hotel industry is limited (Patiar, 2016). Consequently, this study extends prior research by exploring ABC use in relation to hotel financial performance and its interaction effect with AIS user satisfaction. Third, it stresses the significance of AIS user satisfaction and ABC in hotel performance, during the economic crisis that has affected the Greek economy. In such an uncertain business environment, the financial implications of

managers' need for extensive, timely and accurate management accounting information have to be explored. Finally, this research highlights AIS user satisfaction as an enabler of ABC. Since the direct association between ABC and firm performance has been empirically examined with mixed results (Maiga & Jacobs, 2008), it is important for academics to treat AIS user satisfaction as a mediator in this relationship.

The results of our study suggest that when ABC use interacts with high levels of AIS user satisfaction, hotel financial performance is improved. This finding indicates the importance for hotel financial managers to be satisfied with the use of AIS when contemporary management accounting techniques are implemented. Moreover, AIS user satisfaction and ABC use have a positive but not significant impact on financial performance when they act independently.

This article is organized as follows: In the next section we present detailed literature review. Then, we describe the methodology used. Subsequent sections address results and conclusions of the study.

2. Literature Review

2.1 Accounting Information System Effectiveness

Academic research has examined the effectiveness of IS based on the IS Success Model (DeLone & McLean, 1992). According to this model, IS Success is analyzed in six categories: *system quality*, *information quality*, *use*, *user satisfaction*, *individual impact* and *organizational impact*. The updated version of this model (DeLone & McLean, 2003) includes *service quality*, which affects user satisfaction, and *intention to use*, which is indicated as a user attitude measurement. Additionally, *individual impact* and *organizational impact* are merged into a construct named "*net benefits*". Finally, the updated DeLone and McLean IS Success Model suggests that user satisfaction may lead to net benefits. Along these lines, the satisfaction of IS users is considered to be a representative measure of IS effectiveness (Ranganathan & Kannabiran, 2004). Empirical research on the relationship between IS user satisfaction and firm performance confirms that user satisfaction leads to enhanced organizational performance (Baraka *et al.*, 2013; Ben-Zvi, 2012; Gelderman, 1998; Kivijiirvi & Saarinen, 1995). Moreover, Daoud and Triki (2013) suggest that a firm's performance cannot be influenced directly by information quality and system quality but only through user satisfaction.

As far as AIS are concerned, user satisfaction indicates a measure of system effectiveness. It is worthwhile to explore whether AIS users are satisfied with the information generated by the system for decision making, because system

designers can induce users to adopt procedures without intention (Mauldin & Ruchala, 1999). Therefore, AIS have to meet the needs of users, or in other words to be effective. Previous empirical results suggest that the implementation and the integration of AIS in the core business strategy lead to financial and economic benefits (Grande *et al.*, 2011).

Concerning hotel industry, empirical research suggests that the use of IT systems does not always improve hotel productivity (Buhalis, 1998; David *et al.*, 1996), resulting in a *productivity paradox*. For this reason, IS effectiveness is of high interest for hotel IT and financial managers. According to Ham *et al.* (2005), users' perceptions of IT applications should be taken into consideration when hotel performance is examined in relation to IT systems. Additionally, Karimi *et al.* (2004) suggest that when a firm operates in an uncertain business environment like the hotel industry, user perceptions of IS should be evaluated. Hence, IS user satisfaction is perceived to be a key factor for the success of hotels (Au *et al.*, 2002). Finally, the studies of Jang *et al.* (2006) and Lo and Darma (2000) also underline the significance of IS user satisfaction in the context of hotel industry.

Following the above discussion, AIS user satisfaction, as a surrogate of AIS effectiveness, is considered to be a critical driver of hotel financial performance. Since the hotel industry is characterized by intense competition (Winata & Mia, 2005), labour intensity and service customization (Botta- Genoulaz & Millet, 2006), and at the same time, forms a more complex and uncertain business environment compared, for example, to the manufacturing industry (Winata & Mia, 2005), it is even more important for hotel financial managers to be satisfied with the use of AIS. Thus, AIS should serve as a tool to allow them to meet their information requirements. Hotel financial managers should get only necessary and useful information by computerized systems (Burgess, 2000). Furthermore, apart from depicting the financial state of the firm, AIS support hotel financial managers in making effective managerial decisions and improving control operations (Kasavana, 1982). Overall, AIS users must be fully satisfied to perform better in their job and provide better service quality, which, in turn, leads to improved profitability (Au *et al.*, 2002). In hospitality literature, empirical research suggests that the use of AIS, as a back-office application, has a positive impact on hotel performance (Ham *et al.*, 2005). However, taking into account that the use of AIS is considered mandatory, AIS user satisfaction is expected to result in a competitive advantage and increased profitability for hotels. Concluding, we anticipate that the impact of AIS user satisfaction on hotel financial performance will be positive.

We develop the next hypothesis:

H$_1$: *AIS user satisfaction has a positive impact on hotel's financial performance.*

2.2 Activity-Based Costing

One of the most serious problems for accounting practitioners is the allocation of overhead costs to different products and services and the choice of a cost accounting system. The use of traditional costing systems may lead to distortions in product or service costing. This is because overhead costs account for a significant portion of total costs and their occurrence is not always in accordance to the volume of production (Lea, 2007). Furthermore, the increase in the variety of products and services requires an accurate cost allocation. In traditional costing, the easiness of allocating costs in a single activity may result to be too "erroneous and dysfunctional" (Babad & Balachandran, 1993: 565). Hence, ABC was first introduced in the 1980s and has been accepted as a better costing system for obtaining accurate and relevant cost information (Chen *et al.*, 2001). The main objective of ABC is to provide the more accurate tracing of costs to individual cost objects, by means of measuring and then pricing out all the resources used for activities that will lead to the production of goods and services for customers (Cook *et al.*, 2000).

ABC is a costing method that analyzes the activities involved in the production of a single product or service and assigns overhead costs to activities (Beheshti, 2004; Everaert *et al.*, 2008). Afterwards, the costs of all activities consumed by a product or service are accumulated (Babad & Balachandran, 1993). More specifically, the procedure is taking place in two stages. First, the costs of resources are allocated to the activities by using cost drivers. In the second stage, the costs of activities are apportioned to cost objects by cost drivers (Cooper, 1990), which are relevant to each activity separately and can be either volume or non-volume related. Cost drivers result to be the link between activities and costs objects (Cooper, 1988; Cooper, 1990; Cooper & Kaplan, 1992). By conceiving costing information at all the stages of production, ABC users are able to understand at a great extent the source of costs (Dalci *et al.*, 2010), and to identify products and services that are profitable or not (Beheshti, 2004).

In management accounting research, several empirical studies have investigated the benefits of ABC in organizational and financial terms. Findings suggest that when firms use ABC rather than traditional costing systems, the firm's financial performance is improved. Kennedy and Affleck-Graves (2001) find that ABC adopters have a significantly higher financial performance compared to non-adopters. Moreover, according to the study of Lea (2007), the use of ABC has a greater impact on short- and long-term profitability than traditional costing or throughput accounting. Finally, Elhamma and Yi Fei (2013) suggest that ABC leads to increased competitiveness, profitability and higher organizational performance in relation to the traditional methods of management accounting.

In the case of the hotel industry, traditional costing would be unsuccessful to allocate these costs in an accurate way (Kaplan & Cooper, 1998), since the greatest portion of costs is indirect. A clear understanding of the drivers of operating expenses can be beneficial in hotel industry (Potter & Schmidgall, 1999). Therefore, ABC results to be a valuable tool for hotel financial managers to make strategic management decisions properly, because it generates a more detailed, relevant and accurate information (Christensen & Sharp, 1993). Patiar (2016) argues that there are four reasons for hotels to adopt ABC: implementation of effective product strategies through the accurate allocation of indirect costs, positioning in a competitive market through the use of detailed cost information, improvement of efficiency through the elimination of non-value-added activities and achievement of organizational objectives through cost control. Pavlatos (2008) suggests that if hotels adopt more functional costing systems such as ABC, they will be able to reduce costs without providing poorer quality of services and make extensive use of cost data for pricing decisions, performance evaluation and other management practices. The accuracy and the usefulness of costing information are also important for hotel managers to implement management pricing strategies. While pricing may be based either on competition, customer psychology or demand (Pellinen, 2003), costing information is crucial in terms of pricing decisions due to the fact that cost based pricing is commonly used in hotel industry (Hung *et al.*, 2010). Additionally, Makrigiannakis and Soteriades (2007) propose that when hotels use costing information for pricing strategies, accurate cost allocation to their services is required. In this respect, managers can properly implement customer profitability analysis using ABC, with a view to increasing profitability (Cooper & Kaplan, 1991). In conclusion, the use of ABC can force hotels to gain cost advantage over competitors and increased efficiency in strategic and operational decisions, which, in turn, lead to improved profitability and financial performance (Patiar, 2016). Hence, we expect that the impact of ABC use on hotel financial performance will be positive.

We develop the next hypothesis:

H$_2$: *ABC use has a positive impact on hotel's financial performance.*

2.3 The interaction effect of AIS user satisfaction and ABC use

As new technology emerges and advanced IS are being implemented, it is anticipated that management accounting techniques will be affected or even become innovative (Rom & Rohde, 2007). Albu *et al.* (2015) propose that IS and IT can ensure effective management. Nevertheless, the impact of IT in the adoption and success of ABC is indicated in several studies. Advanced information technology is one of the most important factors for managers in order to implement ABC system (Nassar *et al.*, 2015). IT systems that support ABC can vary

significantly from spreadsheet solutions to ABC software system (Charaf & Bescos, 2013). Hence, IT quality does not form an obstacle in implementing more sophisticated costing systems such as ABC (Al-Omiri & Drury, 2007). Along these lines, Pavlatos (2012) suggests that high-quality IT leads to extensive use of cost management systems in hotel industry. Summing up, IT can enable managers to properly implement and use ABC by providing detailed data and cost driver information.

Innovative management accounting techniques require timely and accurate information as well as high quality of system characteristics. Although IT integration can facilitate the implementation of management accounting techniques, it remains unexplored whether the user satisfaction of IS and the use of sophisticated costing systems can synergize with a view to enhancing firm's profitability. Prior research has explored how IT integration, IT sophistication and IT quality interact with the use of management accounting techniques on financial performance. Cagwin and Bouwman (2002) suggest that the interaction of ABC and information technology sophistication has a positive but not significant effect on financial performance. Maiga (2012) finds that IT integration has a significant positive impact on financial indicators for ABC users while this association does not exist in Volume-Based Costing adopters. Additionally, the findings of Maiga *et al.* (2014) indicate a great synergistic effect of IT integration and ABC system on plant manufacturing financial performance is indicated. Cooper (1988) suggests that ABC becomes more beneficial in higher levels of IT while Krumwiede (1998b) claims that high-quality IS can enable ABC to reach the highest implementation stage. Furthermore, Krumwiede and Charles (2014) propose that when firms use ABC and implement high-quality IS, they can better identify profitable services and customers and thus, enhance their profitability. Taking all the above under regard, as long as costing systems become more sophisticated, IS effectiveness is getting increasingly important.

As a consequence, the use of AIS has to be effective by providing all the essential information for the use of ABC. Managers, as ABC users, should get significant costing information in all stages of production and delivery of hotel products and services, while at the same time they should be satisfied with the AIS, which allow them to meet their information requirements. In hotel industry, this synergy is very important for accurate and efficient decision making because of the highly competitive and personalized nature of business (Mia & Pattiar, 2001). The enhanced flow of information will enable hotel financial managers and chief accountants to make management decisions and implement pricing strategies, which, in turn, lead to improved organizational and financial performance. Therefore, we anticipate that the interaction between AIS user satisfaction and ABC use will have a positive effect on hotel financial performance. This

proposition is also in accordance with contingency theory of management accounting (Chenhall, 2003).

We develop the next hypothesis:

H$_3$: *The two-way interaction of AIS User Satisfaction and ABC Use will have a positive impact on financial performance.*

3. Methodology

3.1 Sample

After an extensive literature review, a questionnaire was developed in order to collect data. In accordance with the study of Chongruksut and Brooks (2005), our instrument was pretested by three expert academics and three management accountants in hospitality industry. The pre-test forced us to make some minor modifications with a view to enhancing the effectiveness of our instrument in terms of clarity and readability. The population of our research represented all publicly listed hotels in Greece. Target respondents were financial managers and chief accountants. A sample of 350 hotels was randomly selected from Hellastat database (ICAP - Gallup's subsidiary in Greece). The current study applied the simple random sampling technique based on previous research in hotel and management accounting research (Duh *et al.*, 2006; Garrido-Moreno & Padilla-Melendez, 2011; Jogaratnam & Tse, 2004; Laitinen, 2014; Paraskevas, 2000; Uyar & Bilgin, 2011; Zeglat & Zigan, 2014). Thus, all hotels had the same chance to be selected for sampling. Invitations to participate in our research were sent via email and after coming in contact with chief financial managers and chief accountants, a total of 155 completed questionnaires were returned, forming a response rate of 44.3%. Moreover, we had two sampling criteria in order to accomplish the objectives of our study: (1) hotel financial managers and chief accountants have to use any cost accounting system; (2) hotel financial managers and chief accountants have to be users of AIS. Therefore, 52 of the completed questionnaires were excluded because they did not meet both sampling criteria, leaving 103 usable responses.

The analysis of our sample shows that 21 out of 103 respondents (20.4%) have adopted ABC. This result is in line with the empirical studies of Ittner *et al.* (2002) and Banker *et al.* (2008), who find ABC adoption rates of 26% and 19.8% respectively. In the context of economic crisis, the adoption rate of ABC in our research suggests that Greek hotel financial managers and chief accountants have conceived the importance and the potential benefits of the use of a sophisticated cost accounting method.

3.2 Measurement of variables

3.2.1 AIS User Satisfaction (AISUS)

In our study, we measure AIS user satisfaction with a multidimensional instrument. This is because a single-item instrument may be characterized as unreliable for the reason that it cannot depict whether the user is satisfied with every attribute of the system. Along these lines, previous studies have explored the satisfaction of users on information quality, system quality and system use (Guimaraes & Igbaria, 1997; Hosnavi & Ramezan, 2010) in order to overcome the difficulty of measuring IS user satisfaction.

Therefore, we explore AIS user satisfaction with an overall user's evaluation of the system characteristics, which is consistent with the study of Ong *et al.* (2009). On the grounds that the use of AIS can be characterized as mandatory and not voluntary, we replace usage with usefulness, based on the empirical results of Seddon and Kiew (1996) and the studies of DeLone and McLean (1992) and Szajna (1993). This is also consistent with Wu and Wang (2006: 730) who note that "system use is necessary but not sufficient to create system benefits". Also, Iivari (2005) finds a not significant association between usage and individual impact due to the mandatory nature of the system. Moreover, we exclude service quality in order to construct a well representative measure of user satisfaction, according to the results of meta-analysis research of Petter and McLean (2009). They suggest that service quality is not significantly related to user satisfaction. Overall, we explore whether users of AIS are satisfied in terms of information quality, system quality and usefulness.

In developing the above instrument, we include three groups of questions that evaluate the satisfaction of users in each item. Based on the study of Gu and Jung (2013), we examine information quality in terms of relevance, timeliness, accuracy, sufficiency and format of information generated by AIS. Regarding system quality, we adopt four items used by Wu and Wang (2006), which include system stability, acceptable response time, a user-friendly interface and ease of use. Finally, we use six items developed by Davis (1989) in order to evaluate satisfaction on usefulness: accomplishment of tasks more quickly, improvement of job performance, increase of productivity, enhancement of job effectiveness, making easier to do tasks, AIS usefulness in job. Hence, an instrument of fifteen items is developed in order to capture satisfaction of an AIS user while negative wording is avoided (Gounaris *et al.*, 2007). Each item of AIS User Satisfaction (AISUS) is measured on a 7-point Likert scale ranging from (1) 'strongly disagree' to (7) 'strongly agree'.

3.2.2 ABC use (ABC)

Based on the studies of Banker *et al.* (2008) and Maiga *et al.* (2014), we develop an ABC use variable, asking whether ABC system is implemented at the firm

(0 = not implemented, 1 = plan to implement, 2 = implemented). In our study, we merge the first two categories into one category, which represent firms that have not implemented ABC at the time of the survey. Thus, ABC use is operationalized as a dummy variable where '0' represents 'no implementation' and '1' represents 'implementation'.

3.2.3 Financial Performance (FP)

Research in IT and especially in management accounting (Van der Stede *et al.*, 2005) has been relied on self-reported measures at a great extent. Moreover, a raw of studies has examined financial performance based on perceptions of managers (Brown & Dev, 1997; Clinton & Hunton, 2001; Ham *et al.*, 2005; Ismail & King, 2005; Jurison, 1996; Krumwiede & Charles, 2014; Terziovski *et al.*, 2003). Although published financial ratios can be used, they may be affected by intangible impacts and environmental conditions (Wu & Wang, 2006). Another downside of published financial ratios is that they are too aggregated, short-term and based on a past performance view (Duh *et al.*, 2006). Hence, in our research we use self-reported measures of financial performance based on previous studies. Maiga *et al.* (2014) use a construct measure for financial performance. They ask respondents to assess the improvement of profitability that their firms has experienced, compared to their major competitors, in terms of Return on Sales (ROS), Turnover on Assets (TOA) and Return on Assets (ROA). Additionally, Krumwiede and Charles (2014) measure financial performance with ten metrics, by asking respondents to evaluate their firm's performance in relation to their competitors over the last three years.

In this study, we measure financial performance by asking respondents to indicate the extent to which hotels have experienced improvement in Return on Assets (ROA), Return on Sales (ROS) and Return on Equity (ROE) over the last five years compared to their major competitors. ROA, which represents firm's profitability and management efficiency, is an appropriate indicator of financial performance in hotel industry (Lee & Kim, 2009). ROS, which demonstrates the firm's effectiveness to expand to new or existing markets, has also been used in previous research (Zhang, 2005). Finally, ROE, which represents firm's profitability by measuring management ability to use shareholders' money, can be a reliable tool for capturing financial performance when financial data are not available (Madan, 2007). Each item of financial performance (FP) is measured on a 7-point Likert scale ranging from (1) 'much worse than our competitors' to (7) 'much better than our competitors' over the last five years.

3.2.4 Control variables

To avoid bias caused by other variables that are omitted from our model, the effect of AIS User Satisfaction and ABC use on financial performance is controlled for system years, size and competition.

System Years (SY): Taking into account that firms go through different post-implementation stages to obtain gains, IS impact has to be examined with a time lag. This is also proposed in the studies of Brynjolfsson and Hitt (1998) and Liu *et al.* (2007), who find significant benefits in financial terms after three years of implementation. Jurison (1996) suggests that the IS impact on organizational performance is observed with a time lag. Finally, according to review of Hou (2012), users that have implemented a system for more years than others will be more satisfied by this system. This variable is calculated as the length of time since the implementation of AIS, in years.

Size (SIZE): The impact of firm size on the financial benefits of IT use has been examined in academic literature. Outcomes and benefits of using an IS are not the same between companies of different size (Mabert *et al.*, 2003). Moreover, large firms tend to have more market power in controlling the operational environment and more resources to develop management accounting systems (Laitinen, 2014). Similarly, Albu and Albu (2012) find that size plays significant role for the use and complexity of management accounting practices. Firm size is measured according to the number of beds based on Camisón (2000) and Claver- Cortés *et al.* (2007). This variable takes the value of '1', if the firm is a family hotel (1-100 beds), '2', if it is a small hotel (101-150 beds), '3', if it is a medium-sized hotel (151-300 beds), and '4', if the firm is a large hotel (more than 300 beds).

Competition (COMPET): According to Laitinen (2014), market competition affects performance and enables firms to continuously revise their management control systems. Furthermore, Maiga *et al.* (2014) suggest that competition enhances incentives for raising performance. Since the effective use of AIS can assist managers to obtain a deeper understanding of their work and lower uncertainty in decision making (Chong, 1996), market competition is expected to force firms to exploit their IT resources in order to gain this competitive advantage. Additionally, highly competitive markets require accurate cost data (Chen *et al.*, 2001) with a view to determining prices (Patiar, 2016) and meeting the pressure as a result of globalization (Charaf & Rahmouni, 2014). In our research, market competition is measured on a seven-point Likert scale ranging from (1) 'low competition' to (7) 'high competition' by asking respondents to indicate the extent to which their firms have experienced market competition over the last five years. Because the research is undertaken in the Greek hotel industry, this control variable has to be included in our model as long as there are significant differences in terms of competition in regions all over Greece. This particularity is indicated in the annual study of ICAP (2012) in hotel industry, and it is supported by the data of Hellenic Chamber of Hotels that reveal a significant variation of bed capacity in Greek regions.

3.2.5   Data analysis techniques

Hierarchical regression analysis is used in order to determine the existence of an interaction effect in our study. Maiga *et al.* (2014) suggest that the main effects of the two-way interaction model are arbitrary and have no theoretical meaning due to the use of non-ratio scales. Hence, this analysis is the most appropriate to allow the main effects and the interactive effects of independent variables to be analyzed separately. In our study, the following regression models are employed:

(1) $FP = \alpha_0 + \alpha_1\,SY + \alpha_2\,SIZE + \alpha_3\,COMPET + \zeta$
(2) $FP = \gamma_0 + \gamma_1\,SY + \gamma_2\,SIZE + \gamma_3\,COMPET + \gamma_4\,AISUS + \gamma_5\,ABC + \varepsilon$
(3) $FP = \beta_0 + \beta_1\,SY + \beta_2\,SIZE + \beta_3\,COMPET + \beta_4\,AISUS + \beta_5\,ABC + \beta_6$
          (AISUS x ABC) $+ \delta$

where
   FP = hotel financial performance measured by the average of the response items.
   SY = total years of using AIS.
   SIZE = firm size.
   COMPET = the market competition within the region of the firm's operation.
   AISUS = user satisfaction of AIS measured by the average of the response items.
   ABC = use of the ABC system operationalized as a dummy variable which takes '1' if the firm has implemented ABC system and '0' otherwise.
   AISUS x ABC = interaction term. $\zeta, \varepsilon, \delta$ are the error terms.

4. Results

In this part, we present the descriptive statistics of our sample and discuss the content and construct validity of our instrument. Then, we proceed to the examination of our hypotheses, presenting the correlations and the regression results.

4.1 Descriptive statistics

The sample consists of 67 medium sided and 36 large hotels, based on the number of beds. Family and small hotels were not identified in our survey. This finding can be explained based mainly on two reasons. First, small hotels usually lack resources and skilled personnel in order to implement AIS in their core business. Second, due to limited financial resources (Fotiadis *et al.*, 2013), small hotels are

not capable of implementing cost and management accounting techniques, especially sophisticated ones such ABC. This is because their implementation demands a high level of managerial personnel and high-quality IT systems.

Concerning respondents' characteristics, 67% of the respondents are male while 84.5% of them are over 31 years old. It is noticeable that almost 79% of the respondents are holding a bachelor or a postgraduate degree. Moreover, the questionnaires were answered at a percentage of 83% by financial managers and chief accountants that have working experience over 6 years as accounting and financial professionals. The latter finding indicates the high working experience of the respondents, which is quite critical for our research results and implications.

4.2 Content and construct validity

In terms of content validity, our instrument was developed after an extensive literature review in AIS, cost accounting and hospitality. As it was mentioned before, the questionnaire was then evaluated and reviewed by academics and professionals in the fields of management accounting, accounting information systems and hospitality.

In order to examine construct validity of our instrument, factor analysis was applied using principal component analysis for the AIS User Satisfaction (AISUS) and the Financial Performance (FP) multi-item constructs. To evaluate the suitability for conducting factor analysis, this study used the Kaiser– Mayer–Olkin (KMO) test and Bartlett's test of sphericity. Values of KMO were higher than 0.6 (Tabachnick & Fidell, 2007) and the results of Bartlett's test of sphericity were significant for both of two constructs (Table 1). These results indicated the suitability of the variables for factor analysis.

Table 1. Tests for factor analysis

Construct	Number of items	Kaiser-Meyer-Olkin	Bartlett's test of sphericity
AIS User Satisfaction	15	0.946	Significant (p<0.001)
Financial Performance	3	0.719	Significant (p<0.001)

Items with factor loadings less than 0.55 due to our sample size (Hair *et al.*, 2009), and items with factor loadings greater than 0.30 on two or more factors (Lai *et al.*, 2007; Yoon *et al.*, 1998) were eliminated from the scale with a view to improving the validity of the instrument. We established these rules since they are common practices for achieving higher uni-dimensionality and construct validity. As a result, five items of AIS User Satisfaction construct (AISUS1, AISUS3, AISUS7, AISUS10 and AISUS12) were eliminated from the analysis. After the elimination

of these items, a new factor analysis was performed. The results revealed that each of two variable constructs (AIS User Satisfaction, Financial Performance) ended up with just one component, and so they can be treated as single measures. The fact that all items loaded on a single factor for each variable construct indicates uni-dimensionality and discriminant validity. In terms of reliability, the internal consistency of each multi-item construct variable was examined by using Cronbach's alpha and corrected item-total correlations scores. As shown in Table 2, the internal consistencies of each scale are quite high. The Cronbach's alpha coefficients ranged from 0.830 to 0.938, which are higher than the suggested cutoff value of 0.60 (Hair *et al.*, 2009). Furthermore, correlation between the item and the rest of the scale is represented by corrected item-total correlation. If the value of items-total correlation is low, then the item should be deleted because it is not measuring what the rest is trying to measure (Lai *et al.*, 2007). Variables with an item-to-total correlation score lower than 0.3 had to be removed, as suggested by Ko and Stewart (2002). The item-to-total correlations for AISUS scale ranged from 0.564 to 0.838 and for FP scale ranged from 0.663 to 0.721. Therefore, no item was excluded.

Table 2. Construct uni-dimensionality and reliability

Construct	Instrument Items	Numbers of items		Total variance explained (%)	Cronbach alpha
		Original	Deleted		
AIS User Satisfaction	AISUS1-AISUS15	15	5	64.656	0.938
Financial Performance	FP1-FP3	3	0	74.793	0.830

4.3 Correlations

Table 3 reports the Pearson correlation matrix and descriptive statistics of the variables. Financial Performance (FP) has a positive relationship with AIS User Satisfaction (AISUS) (r=0.271, p≤0.01) and ABC use (ABC) (r=0.311, p≤0.01). Additionally, it is positively correlated with all control variables. ABC use (ABC) is positively and significantly correlated with AIS User Satisfaction (AISUS). This result suggests that effective use of IS can enforce firms to implement and use ABC. Moreover, Size is positively and significantly correlated with ABC use (ABC) (r=0.387, p≤0.01). This finding is in accordance with the results of Krumwiede (1998b). The descriptive statistics of our variables reveal that hotel financial managers and chief accountants are moderately satisfied with AIS, as the mean of this variable is 3.767. Finally, the mean value of Competition (COMPET) is 4.816, illustrating the highly competitive business environment of the Greek hotel.

Table 3. Correlations, Means and Standard Deviations for the variables (N=103)

	FP	*AISUS*	*ABC*	*SY*	*SIZE*	*COMPET*
FP	1					
AISUS	0.271**	1				
ABC	0.311**	0.384**	1			
SY	0.302**	0.177	0.154	1		
SIZE	0.210*	0.263**	0.387**	-0.081	1	
COMPET	0.153	0.103	0.084	-0.094	0.067	1
Mean	3.884	3.767	0.204	8.029	3.350	4.816
Std. Dev.	1.126	0.908	0.405	3.057	0.479	1.413

*, ** indicates significance at 5% and 1% levels respectively

FP: the level of firm's financial performance measured by the average of the response items, SY: total years of using AIS, SIZE: firm size, COMPET: the level of market competition within the region of the firm's operation, AISUS: the level of AIS user satisfaction measured by the average of the response items, ABC: use of the ABC system operationalized as a dummy variable which takes '1' if the firm has implemented ABC system and '0' otherwise, AISUS x ABC: interaction term of AIS user satisfaction and ABC use

4.4 Regression results

The cross-product term is strongly correlated with the variables that compose it, causing high multicollinearity. For this reason, based on the review of Maiga *et al.* (2014), it is a common practice to manipulate the origin points for the continuous variables, without affecting the value or the significance of the regression coefficient. In this study, the continuous variable (AIS User Satisfaction) is mean centered. According to Hair *et al.* (2009), a small degree of multicollinearity can be indicated if Variance Inflation Factor (VIF) values are low (<10). The highest value of VIF in our model is 2.280, which suggests that no multicollinearity exists. Furthermore, our variables have to satisfy the following assumptions for conducting multiple regression analysis: linearity, constant variance and normality (Hair *et al.*, 2009). Scatterplots, Levene's test and Shapiro-Wilk test were undertaken respectively and no problems were identified. Regarding autocorrelation, we conducted the Durbin-Watson's (DW) test. Our model presents values near 2 (DW=2.038). This result indicates the absence of autocorrelation in residuals.

The results of the hierarchical regressions are presented in Table 4. Equation (1) reports the results of the control variables. System Years (SY) and Size (SIZE) have a significant impact on Financial Performance (FP) (α=0.124, p=0.000;

α=0.529, p=0.016 respectively). Competition (COMPET) has a positive impact on financial performance at p<0.10. In Equation (2), AIS User Satisfaction (AISUS) and ABC use (ABC) are inserted in the model. Both variables are positive but not significantly related to Financial Performance (FP) (γ=0.135, p=0.279; γ=0.453, p=0.121 respectively). Hence, H_1 and H_2 are partially supported. Nonetheless, in Equation (3), the interaction term of AIS User Satisfaction (AISUS) and ABC use (ABC), which is included in the model, is significantly and positively associated with Financial Performance (FP) (β=0.760, p=0.047). In this case, H_3 is strongly supported. Moreover, all three control variables have a positive impact on Financial Performance (FP). Finally, the explained variance of the model is 24.7%, which is 3.2% higher in relation to the main effects model.

Table 4. Regression Results for Financial Performance

	Equation (1)			Equation (2)			Equation (3)	
	α	**p- value**		**γ**	**p- value**		**β**	**p- value**
SY	0.124	0.000		0.104	0.003		0.104	0.003
SIZE	0.529	0.016		0.307	0.194		0.218	0.357
COMPET	0.135	0.068		0.116	0.113		0.109	0.132
AISUS				0.135	0.279		0.053	0.681
ABC				0.453	0.121		0.046	0.897
AISUS x ABC							0.760	0.047
R²	0.418			0.464			0.497	
Adj. R²	0.175			0.215			0.247	
ΔR²	-			0.040			0.032	
F	6.981			5.311			5.242	
p- value	0.000			0.000			0.000	

FP: the level of firm's financial performance measured by the average of the response items, SY: total years of using AIS, SIZE: firm size, COMPET: the level of market competition within the region of the firm's operation, AISUS: the level of AIS user satisfaction measured by the average of the response items, ABC: use of the ABC system operationalized as a dummy variable which takes '1' if the firm has implemented ABC system and '0' otherwise, AISUS x ABC: interaction term of AIS user satisfaction and ABC use

In conclusion, our results indicate that AIS User Satisfaction (AISUS) and ABC use (ABC) do not have a significant impact on Financial Performance (FP) when they act independently. On contrary, they have a significant and positive association with Financial Performance (FP) when they interact with each other.

5. Conclusion and discussion

This paper contributes to IT and management accounting research by developing a new framework that combines IS user satisfaction theory and contemporary management accounting techniques. Therefore, we explore the significance of the

interaction effect of AIS user satisfaction and ABC use on firm financial performance in the Greek hotel industry.

Using hierarchical regression analysis, results suggest that AIS user satisfaction has a positive but not significant impact on hotel financial performance. This result suggests that the potential organizational benefits must be examined through individual impacts, as suggested in the initial IS success model (DeLone & McLean, 1992). Furthermore, our results indicate that the direct effect of ABC use on hotel financial performance is not significant. This outcome raises the importance of enabling contextual factors that will synergize with the effective cost accounting information provided by AIS. Therefore, when ABC is used concurrently with other initiatives, then it is more beneficial (Cagwin & Bouwman, 2002). Finally, the interaction effect of AIS user satisfaction and ABC use is found to have a significant positive impact on hotel financial performance. Thus, we propose that IT systems should not only be of high quality or integrated when they interact with ABC use (Krumwiede & Charles, 2014; Maiga *et al.*, 2014), but they should be also effective in terms of user satisfaction in order for financial benefits to be gained.

This study creates several implications. First of all, when the effect of a sophisticated costing system on organizational performance is examined, AIS user satisfaction should be taken under consideration. Hence, AIS user satisfaction is highlighted as an enabling factor under which ABC use leads to improved performance. The synergy of AIS user satisfaction and innovative management accounting techniques creates a new theoretical framework in the literature, which can be extended in the light of our results. Along these lines, the effective use of AIS can enforce firms to implement contemporary management accounting techniques such as ABC, as suggested by the correlation results. Finally, since AIS user satisfaction does not have a significant direct effect on financial performance, the role of individual (managerial) performance should not be omitted, acting as a mediator in this relationship.

From a managerial point of view, it is important for hotel financial managers and chief accountants to be satisfied with the AIS, when ABC system is used, in order to make accurate decisions and implement efficient management strategies, which, in turn, lead to improved financial performance. This research is undertaken during a severe economic crisis that has affected the Greek hotel industry to a great extent. Based on our findings, hotel financial managers have conceived the potential benefits of implementing innovative management accounting techniques while at the same time they are satisfied with the use of AIS in an uncertain business environment. Hence, an efficient management accounting system such as ABC can ensure the hotel's financial stability (Briciu & Capusneanu, 2013). The results of this study can be used as a driver for many hospitality software designers to

improve the characteristics of AIS based on the needs and the perceptions of users. Hotel financial and accounting executives and software developers have to collaborate to increase a user's satisfaction. Additionally, specialized seminars or workshops can be hosted, providing all the necessary feedback for designing and implementing customized AIS for hospitality firms with the participation of hotel financial managers and software developers. Finally, a time lag between AIS implementation and financial performance is proposed by the results of regression analysis. Consequently, hotel financial managers and chief accountants, as users of effective AIS, should be patient with acquiring financial benefits. Just like our study proves, the longer the using time period, the better financial performance is achieved.

The present study has a number of limitations that can be addressed in future research. First, in developing the variable of AIS user satisfaction, we have not included items regarding the dimension of service quality, based on the results of previous meta-analyses. Second, since the research is conducted in the Greek hotel industry, generalizing our results to other industries (such as manufacturing industry) and countries should be done cautiously. Third, the use of perceptual financial performance ratings may not represent objective reality (Maiga *et al.*, 2014).

Despite the limitations above, this study provides opportunities for further research and investigation. A new framework is developed in the current study, combining IS user satisfaction theory and management accounting literature. Thus, a goal of future research is to extend this framework and validate our results in other settings. Moreover, instead of using self-reported indicators for assessing financial performance, future research can include both primary and secondary data. A future study should also contain other control variables such as hotel characteristics -category, hotel age, brand affiliation status, location and lodging type- and mediators such as organizational structure and managerial performance. Finally, due to the fact that our construct variables are based on the managers' perceptions, a longitudinal approach to this study should be applied because the needs and the beliefs of users may change during the time.

Acknowledgement

References

Al-Omiri, M., & Drury, C. (2007) "A survey of factors influencing the choice of product costing systems in UK organizations", *Management Accounting Research*, vol. 18, no. 4: 399-424

Albu C. N., Albu, N., Dumitru, M., & Dumitru, V. F. (2015) "The Impact of the Interaction between Context Variables and Enterprise Resource Planning Systems on Organizational Performance: A Case Study from a Transition Economy", *Information Systems Management*, vol. 32, no. 3: 252-264

Albu, N., & Albu, C. N. (2012) "Factors associated with the adoption and use of management accounting techniques in developing countries: The case of Romania", *Journal of International Financial Management & Accounting*, vol. 23, no. 3: 245-276

Au, N., Ngai, E. W., & Cheng, T. E. (2002) "A critical review of end-user information system satisfaction research and a new research framework", *Omega*, vol. 30, no. 6: 451-478

Babad, Y. M., & Balachandran, B. V. (1993) "Cost driver optimization in activity-based costing", *Accounting Review*, vol. 68, no. 3: 563-575

Banker, R. D., Bardhan, I. R., & Chen, T. Y. (2008) "The role of manufacturing practices in mediating the impact of activity-based costing on plant performance", *Accounting, organizations and society*, vol. 33, no. 1: 1-19

Baraka, H. A., Baraka, H. A., & EL-Gamily, I. H. (2013) "Assessing call centers' success: A validation of the DeLone and McLean model for information system", *Egyptian Informatics Journal*, vol. 14, no. 2: 99-108

Beheshti, H. M. (2004) "Gaining and sustaining competitive advantage with activity based cost management system", *Industrial Management & Data Systems*, vol. 10, no. 5: 377-383

Ben-Zvi, T. (2012) "Measuring the perceived effectiveness of decision support systems and their impact on performance", *Decision Support Systems*, vol. 54, no.1: 248-256

Briciu, S., & Capusneanu, S. (2013) "Pros and cons for the implementation of target costing method in Romanian Economic Entities", *Accounting and Management Information Systems*, vol. 12, no. 3: 455-470

Botta-Genoulaz, V., & Millet, P. A. (2006) "An investigation into the use of ERP systems in the service sector", *International Journal of Production Economics*, vol. 99, no. 1: 202-221

Brown, J. R., & Dev, C. S. (1997) "The franchisor-franchisee relationship: A key to franchise performance", *The Cornell Hotel and Restaurant Administration Quarterly*, vol. 38, no. 6: 4-38

Brynjolfsson, E., & Hitt, L. M. (1998) "Beyond the productivity paradox", *Communications of the ACM*, vol. 41, no. 8: 49-55

Buhalis, D. (1998) "Strategic use of information technologies in the tourism industry", *Tourism management*, vol. 19, no. 5: 409-421

Burgess, C. (2000) "The hotel financial manager-challenges for the future", *International Journal of Contemporary Hospitality Management*, vol. 12, no. 1: 6-12

Cagwin, D., & Bouwman, M. J. (2002) "The association between activity-based costing and improvement in financial performance", *Management Accounting Research*, vol. 13, no. 1: 1-39

Camisón, C. (2000) "Strategic attitudes and information technologies in the hospitality business: an empirical analysis", *International Journal of Hospitality Management*, vol. 19, no. 2: 125-143

Charaf, K., & Bescos, P.L. (2013) "The role of organizational and cultural factors in the adoption of Activity-Based Costing: The case of Moroccan firms", *Accounting and Management Information Systems*, vol. 12, no. 1: 4-21

Charaf, K., & Rahmouni, A. F. (2014) "Using importance performance analysis to evaluate the satisfaction of Activity- Based Costing adopters", *Accounting and Management Information Systems*, vol. 13, no. 4: 665-685

Chathoth, P. K. (2007) "The impact of information technology on hotel operations, service management and transaction costs: A conceptual framework for full-service hotel firms", *International Journal of Hospitality Management*, vol. 26, no. 2: 395-408

Chen, G., Firth, M., & Park, K. (2001) "The implementation and benefits of activity-based costing: a Hong Kong study", *Asian Review of Accounting*, vol. 9, no. 2: 23-37

Chenhall, R. H. (2003) "Management control systems design within its organizational context: findings from contingency-based research and directions for the future", *Accounting, organizations and society*, vol. 28, no. 2: 127-168

Chong, V. K. (1996) "Management accounting systems, task uncertainty and managerial performance: a research note", *Accounting, Organizations and Society*, vol. 21, no. 5: 415-421

Chongruksut, W., & Brooks, A. (2005) "The adoption and implementation of activity-based costing in Thailand", *Asian Review of Accounting*, vol. 13, no. 2: 1-17

Christensen, L. F., & Sharp, D. (1993) "How ABC can add value to decision making", *Strategic Finance*, vol. 74, no. 11: 38-42

Claver-Cortés, E., Molina-Azorín, J. F., & Pereira-Moliner, J. (2007) "The impact of strategic behaviours on hotel performance", *International Journal of Contemporary Hospitality Management*, vol. 19, no. 1: 6-20

Clinton, B. D., & Hunton, J. E. (2001) "Linking Participative Budgeting Congruence to Organization Performance", *Behavioral Research in Accounting*, vol. 13, no. 1: 127-141

Cook, T. J., Grove, H. D., & Coburn, S. (2000) "ABC process-based capital budgeting", *Journal of Managerial Issues*, vol. 12, no. 3: 305-323

Cooper, R. (1988) "The rise of ABC–part two: when do I need an ABC system", *Journal of Cost Management*, vol. 1, no. 1: 41-48

Cooper, R. (1990) "Cost classification in unit-based and activity-based manufacturing cost systems", *Journal of Cost management*, vol. 4, no. 3: 4-14

Cooper, R., & Kaplan, R. S. (1991) "Profit priorities from activity-based costing", *Harvard Business Review*, vol. 69, no. 3: 130-135

Cooper, R., & Kaplan, R. S. (1992) "Activity-based systems: Measuring the costs of resource usage", *Accounting Horizons*, vol. 6, no. 3: 1-13

Dalci, I., Tanis, V., & Kosan, L. (2010) "Customer profitability analysis with time-driven activity-based costing: a case study in a hotel", *International Journal of contemporary hospitality Management*, vol. 22, no. 5: 609-637

Daoud, H., & Triki, M. (2013) "Accounting information systems in an ERP environment and Tunisian firm performance", *The International Journal of Digital Accounting Research,* vol. 13: 1-35

David, J. S., Grabski, S., & Kasavana, M. (1996) "The productivity paradox of hotel-industry technology", *The Cornell Hotel and Restaurant Administration Quarterly*, vol. 37, no. 2: 64-70

Davis, F. D. (1989) "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS quarterly*, vol. 13, no. 3: 319-340

DeLone, W. H., & McLean, E. R. (1992) "Information systems success: The quest for the dependent variable", *Information systems research*, vol. 3, no. 1: 60-95

Delone, W. H., & McLean, E. R. (2003) "The DeLone and McLean model of information systems success: a ten-year update", *Journal of management information systems*, vol. 19, no. 4: 9-30

Duh, R. R., Chow, C. W., & Chen, H. (2006) "Strategy, IT applications for planning and control, and firm performance: The impact of impediments to IT implementation", *Information & Management*, vol. 43, no. 8: 939-949

Elhamma, A., & Yi Fei, Z. (2013) "The Relationship Between Activity Based Costing, Business Strategy and Performance in Moroccan Enterprises", *Accounting and Management Information Systems*, vol. 12, no. 1: 22-38

Everaert, P., Bruggeman, W., Sarens, G., Anderson, S. R., & Levant, Y. (2008) "Cost modeling in logistics using time-driven ABC: Experiences from a wholesaler", *International Journal of Physical Distribution & Logistics Management*, vol. 38, no. 3: 172-191

Fotiadis, A. K., Vassiliadis, C. A., & Rekleitis, P. D. (2013) "Constraints and benefits of sustainable development: a case study based on the perceptions of small-hotel entrepreneurs in Greece", *Anatolia*, vol. 24, no. 2: 144-161

Garrido-Moreno, A., & Padilla-Meléndez, A. (2011) "Analyzing the impact of knowledge management on CRM success: The mediating effects of organizational factors", *International Journal of Information Management*, vol. 31, no. 5: 437-444

Gatian, A. W. (1994) "Is user satisfaction a valid measure of system effectiveness?", *Information & Management*, vol. 26, no. 3: 119-131

Gelderman, M. (1998) "The relation between user satisfaction, usage of information systems and performance", Information & Management, vol. 34, no. 1: 11-18

Gounaris, S. P., Panigyrakis, G. G., & Chatzipanagiotou, K. C. (2007) "Measuring the effectiveness of marketing information systems: An empirically validated instrument", *Marketing Intelligence & Planning*, vol. 25, no. 6: 612-631

Grande, E. U., Estébanez, R. P., & Colomina, C. M. (2011) "The impact of Accounting Information Systems (AIS) on performance measures: empirical evidence in Spanish SMEs", *The International Journal of Digital Accounting Research*, vol. 11: 25-43

Gu, J. W., & Jung, H. W. (2013) "The effects of IS resources, capabilities, and qualities on organizational performance: An integrated approach", *Information & Management*, vol. 50, no. 2: 87-97

Guimaraes, T., & Igbaria, M. (1997) "Client/server system success: Exploring the human side", *Decision Sciences*, vol. 28, no. 4: 851-876

Hair, J. F. Black, WC Babin, B. J. & Anderson, R. E. (2009) *Multivariate Data Analysis*, New Jersey: Prentice Hall

Ham, S., Kim, W. G., & Jeong, S. (2005) "Effect of information technology on performance in upscale hotels", *International Journal of Hospitality Management*, vol. 24, no. 2: 281-294

Hosnavi, R., & Ramezan, M. (2010) "Measuring the effectiveness of a human resource information system in National Iranian Oil Company: An empirical assessment", *Education, Business and Society: Contemporary Middle Eastern Issues*, vol. 3, no. 1: 28-39

Hou, C. K. (2012) "Examining the effect of user satisfaction on system usage and individual performance with business intelligence systems: An empirical study of Taiwan's electronics industry", *International Journal of Information Management*, vol. 32, no. 6: 560-573

Huh, H. J., Kim, T. T., & Law, R. (2009) "A comparison of competing theoretical models for understanding acceptance behavior of information systems in upscale hotels", *International Journal of Hospitality Management*, vol. 28, no. 1: 121-134

Hung, W. T., Shang, J. K., & Wang, F. C. (2010) "Pricing determinants in the hotel industry: Quantile regression analysis", *International Journal of Hospitality Management*, vol. 29, no. 3: 378-384

ICAP (2012) *Sector Studies: Hotels*, Athens: ICAP Group

Iivari, J. (2005) "An empirical test of the DeLone-McLean model of information system success", *ACM Sigmis Database*, vol. 36, no. 2: 8-27

IOBE (2012) *The Impact of Tourism on Greek Economy,* Athens: Foundation for Economic & Industrial Research

Ismail, N. A., & King, M. (2005) "Firm performance and AIS alignment in Malaysian SMEs", *International Journal of Accounting Information Systems*, vol. 6, no. 4: 241-259

Ittner, C. D., Lanen, W. N., & Larcker, D. F. (2002) "The association between activity-based costing and manufacturing performance", *Journal of Accounting Research*, vol. 40, no. 3: 711-726

Jang, J. H., Kim, J. K., & Hwang, Y. H. (2006) "Influence of hotel information system quality on system use and user satisfaction", *Journal of Quality Assurance in Hospitality & Tourism*, vol. 7, no. 3: 41-58

Jogaratnam, G., & Tse, E. C. Y. (2004) "The Entrepreneurial Approach to Hotel Operation Evidence from the Asia-Pacific Hotel Industry", *Cornell Hotel and Restaurant Administration Quarterly*, vol. 45, no. 3: 248-259

Jurison, J. (1996) "The temporal nature of IS benefits: A longitudinal study", *Information & Management*, vol. 30, no. 2: 75-79

Kaplan, R.S., & Cooper, R. (1998) *Cost & effect: Using integrated cost systems to drive profitability and performance*, Cambridge: Harvard Business Press

Karimi, J., Somers, T. M., & Gupta, Y. P. (2004) "Impact of environmental uncertainty and task characteristics on user satisfaction with data", *Information Systems Research*, vol. 15, no. 2: 175-193

Kasavana, M. L. (1982) "Computer-assisted hospitality information systems", *International Journal of Hospitality Management*, vol. 1, no. 2: 91-94

Kennedy, T., & Affleck-Graves, J. (2001) "The impact of activity-based costing techniques on firm performance", *Journal of management accounting research*, vol. 13, no. 1: 19-45

Kivijärvi, H., & Saarinen, T. (1995) "Investment in information systems and the financial performance of the firm", *Information & Management*, vol. 28, no. 2: 143-163

Ko, D. W., & Stewart, W. P. (2002) "A structural equation model of residents' attitudes for tourism development", *Tourism management*, vol. 23, no. 5: 521-530

Krumwiede, K. R. (1998a) "ABC why it's tried and how it succeeds", *Strategic finance*, vol. 79, no. 10: 32-38

Krumwiede, K. R. (1998b) "The implementation stages of activity-based costing and the impact of contextual and organizational factors", *Journal of Management Accounting Research*, vol. 10: 239-277

Krumwiede, K. R., & Charles, S. L. (2014) "The Use of Activity-based Costing with Competitive Strategies: Impact on Firm Performance", *Advances in Management Accounting (Advances in Management Accounting, Volume 23) Emerald Group Publishing Limited*, vol. 23: 113-148

Lai, F., Hutchinson, J., Li, D., & Bai, C. (2007) "An empirical assessment and application of SERVQUAL in mainland China's mobile communications industry", *International Journal of Quality & Reliability Management*, vol. 24, no. 3: 244-262

Laitinen, E. K. (2014) "Influence of cost accounting change on performance of manufacturing firms", *Advances in Accounting*, vol. 30, no. 1: 230-240

Law, R., & Jogaratnam, G. (2005) "A study of hotel information technology applications", *International Journal of Contemporary Hospitality Management*, vol. 17, no. 2: 170-180

Lea, B. R. (2007) Management accounting in ERP integrated MRP and TOC environments. *Industrial Management & Data Systems*, vol. 107, no. 8: 1188-1211

Lee, S., & Kim, W. G. (2009) "EVA, refined EVA, MVA, or traditional performance measures for the hospitality industry?", *International Journal of Hospitality Management*, vol. 28, no. 3: 439-445

Liu, L., Miao, R., & Li, C. (2008) "The impacts of enterprise resource planning systems on firm performance: an empirical analysis of Chinese chemical firms" In *Research and Practical Issues of Enterprise Information Systems II* (pp. 579-587). Springer US

Lo, B., & Darma, C. S. (2000) "Employee Perception of the Impact of Information Technology Investment in Organisations: a survey of the hotel industry", *Australasian Journal of Information Systems*, vol. 7, no. 2: 32-51

Mabert, V. A., Soni, A., & Venkataramanan, M. A. (2003) "The impact of organization size on enterprise resource planning (ERP) implementations in the US manufacturing sector", *Omega*, vol. 31, no. 3: 235-246

Madan, K. (2007) "An analysis of the debt-equity structure of leading hotel chains in India", *International Journal of Contemporary Hospitality Management*, vol. 19, no. 5: 397-414

Maiga, A. S. (2012) "The Effects of Information Technology Integration on Manufacturing Financial Performance: The Role of Cost Control Systems", *Advances in Management Accounting*, vol. 21: 183-206

Maiga, A. S. (2014) "Assessing self-selection and endogeneity issues in the relation between activity-based costing and performance", *Advances in Accounting*, vol. 30, no. 2: 251-262

Maiga, A. S. (2015) "Information Systems Integration and Firm Profitability: Mediating Effect of Cost Management Strategy", *Advances in Management Accounting*, vol. 25: 149-179

Maiga, A. S., & Jacobs, F. A. (2003) "Balanced scorecard, activity-based costing and company performance: an empirical analysis", *Journal of Managerial Issues*, vol. 15, no. 3: 283-301

Maiga, A. S., & Jacobs, F. A. (2008) "Extent of ABC use and its consequences", Contemporary Accounting Research, vol. 25, no. 2: 533-566

Maiga, A. S., Nilsson, A., & Jacobs, F. A. (2014) "Assessing the interaction effect of cost control systems and information technology integration on manufacturing plant financial performance", *The British Accounting Review*, vol. 46, no. 1: 77-90

Makrigiannakis, G., & Soteriades, M. (2007) "Management accounting in the hotel business: The case of the Greek hotel industry", *International Journal of Hospitality & Tourism Administration*, vol. 8, no. 4: 47-76

Mauldin, E. G., & Ruchala, L. V. (1999) "Towards a meta-theory of accounting information systems", *Accounting, Organizations and Society*, vol. 24, no. 4: 317-331

Melián-González, S., & Bulchand-Gidumal, J. (2016) "A model that connects information technology and hotel performance", *Tourism Management*, vol. 53: 30-37

Mia, L., & Patiar, A. (2001) "The use of management accounting systems in hotels: an exploratory study", *International Journal of Hospitality Management*, vol. 20, no. 2: 111-128

Nassar, M., Morris, D., Thomas, A. and Sangster, A. (2009) "An empirical study of activity-based costing (ABC) systems within the Jordanian industrial sector: Critical success factors and barriers to ABC implementation", In M.Tsamenyi, S.Uddin (Eds.) *Accounting in Emerging Economies* (pp. 229-263). Emerald Group Publishing Ltd

Nikolaou, A.I. (1999) *Accounting Information Systems*, Athens: Mpenou E. Publishing

Nicolaou, A. I. (2000) "A contingency model of perceived effectiveness in accounting information systems: Organizational coordination and control effects", *International Journal of Accounting Information Systems*, vol. 1, no. 2: 91-105

Ong, C. S., Day, M. Y., & Hsu, W. L. (2009) "The measurement of user satisfaction with question answering systems", *Information & Management*, vol. 46, no. 7: 397-403

Paraskevas, A. J. (2000) "Management selection practices in Greece: are hospitality recruiters any different?", *International Journal of Hospitality Management*, vol. 19, no. 3: 241-259

Patiar, A. (2016) "Costs allocation practices: Evidence of hotels in Australia", *Journal of Hospitality and Tourism Management*, vol. 26: 1-8

Pavlatos, O. (2008) "Hospitality Cost System Design: The Impact of Strategy and Use of Data", *Accounting and Management Information Systems*, vol. 25: 93-108

Pavlatos, O. (2012) "The impact of CFOs' characteristics and information technology on cost management systems", *Journal of Applied Accounting Research*, vol. 13, no. 3: 242-254

Pellinen, J. (2003) "Making price decisions in tourism enterprises", *International Journal of Hospitality Management*, vol. 22, no. 2: 217-235

Perera, S., Harrison, G., & Poole, M. (1997) "Customer-focused manufacturing strategy and the use of operations-based non-financial performance measures: a research note", *Accounting, Organizations and Society*, vol. 22, no. 6: 557-572

Petter, S., & McLean, E. R. (2009) "A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level", *Information & Management*, vol. 46, no. 3: 159-166

Potter, G., & Schmidgall, R. S. (1999) "Hospitality management accounting: current problems and future opportunities", *International Journal of Hospitality Management*, vol. 18, no. 4: 387-400

Ranganathan, C., & Kannabiran, G. (2004) "Effective management of information systems function: an exploratory study of Indian organizations", *International Journal of Information Management*, vol. 24, no. 3: 247-266

Rom, A., & Rohde, C. (2007), "Management accounting and integrated information systems: A literature review", *International Journal of Accounting Information Systems*, vol. 8, no. 1: 40-68

Seddon, P., & Kiew, M. Y. (1996) "A partial test and development of DeLone and McLean's model of IS success", *Australasian Journal of Information Systems*, vol. 4, no. 1: 90-109

SETE (2013) *Greek Tourism: Fact & Figure*, Athens: Greek Tourism Confederation

Siguaw, J. A., Enz, C. A., & Namasivayam, K. (2000) "Adoption of information technology in U.S. hotels: Strategically driven objectives", *Journal of Travel Research, vol. 39*, no. 2: 192-201

Spathis, C. (2006) "Enterprise systems implementation and accounting benefits", *Journal of Enterprise Information Management*, vol. 19, no. 1: 67-82

Szajna, B. (1993) "Determining information system usage: some issues and examples", *Information & Management*, vol. 25, no. 3: 147-154

Tabachnick, B. G., & Fidell, L. S. (2007) *Using Multivariate Statistics* (5th ed), Boston: Pearson Education

Taipaleenmäki, J., & Ikäheimo, S. (2013) "On the convergence of management accounting and financial accounting–the role of information technology in accounting change", *International Journal of Accounting Information Systems*, vol. 14, no. 4: 321-348

Terziovski, M., Fitzpatrick, P., & O'Neill, P. (2003) "Successful predictors of business process reengineering (BPR) in financial services", *International Journal of Production Economics*, vol. 84, no. 1: 35-50

Uyar, A., & Bilgin, N. (2011) "Budgeting practices in the Turkish hospitality industry: An exploratory survey in the Antalya region", *International Journal of Hospitality Management*, vol. 30, no. 2: 398-408

Van der Stede, W. A., Young, S. M., & Chen, C. X. (2005) "Assessing the quality of evidence in empirical management accounting research: The case of survey studies", *Accounting, organizations and society*, vol. 30, no. 7: 655-684

Wang, Y., & Qualls, W. (2007) "Towards a theoretical model of technology adoption in hospitality organizations", *International Journal of Hospitality Management*, vol. 26, no. 3: 560-573

Winata, L., & Mia, L. (2005) "Information technology and the performance effect of managers' participation in budgeting: evidence from the hotel industry", *International Journal of Hospitality Management*, vol. 24, no. 1: 21-39

Wu, J. H., & Wang, Y. M. (2006) "Measuring KMS success: A respecification of the DeLone and McLean's model", *Information & Management*, vol. 43, no. 6: 728-739

Yoon, Y., Guimaraes, T., & Clevenson, A. (1998) "Exploring expert system success factors for business process reengineering", *Journal of Engineering and Technology Management*, vol. 15, no. 2: 179-199

Zeglat, D., & Zigan, K. (2014) "Intellectual capital and its impact on business performance: Evidences from the Jordanian hotel industry", *Tourism and Hospitality Research*, vol. 13, no. 2: 83-100

Zhang, D., Linderman, K., & Schroeder, R. G. (2012) "The moderating role of contextual factors on quality management practices", *Journal of Operations Management*, vol. 30, no. 1: 12-23

Zhang, M. J. (2005) "Information systems, strategic flexibility and firm performance: an empirical investigation", *Journal of Engineering and Technology Management*, vol. 22, no. 3: 163-184