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Factors Influencing the Adoption of Balanced Scorecard in the Saudi Arabia Services Sector

Abstract

In recent years, many authors have been claimed that many companies adopt new approaches to their performance and measurement systems. The BSC is one of the most widely used approaches making new in roads into the academic and business literature. Therefore, this paper examines the contextual factors that influence the characteristics of performance systems design using a postal questionnaire instrument and examines the extent of the adoption rate of the balanced scorecard (BSC) in KSA services companies .

Results demonstrate that there is indeed a significant relation between BSC adoption and Intensity of the competitive environment; Size; extent of the application of total quality management approaches; and extent of use of innovative/strategic management accounting techniques. These potential explanatory factors giving direction for further research.

Keywords: BSC:Adoption; strategic management accounting techniques; TQM; Competition.

1. Introduction

With the rise of the policy of economic liberalization the shape, form nature and size of form and business establishment, has gone a see a see – change. As firms on the global plane, have started operative business establishments on the intra-continental plane it is but natural that an on – going relentless process of amalgamation of forms has radically changed the form, nature and behavioural patterns of organisational processes. As such a new set of preferential attitude in the sphere of pricing, budgeting and accounting has emerged as new trend – setter The whole business scenario renews in a new look. As such the colossal change in shape, size, form, behaviour, preference and new consumerism in the global market can realistically be seen. The planners and strategists, in the present socio – economic scenario agonisingly look at the new preferential, taste, consumerism and new set of behavioural patterns evolving a much different form of organisational process. Having taken into account the planners and thrice control strategists need to evolve a system or a modus operandi to evolve a system which could accommodate and sort of the problems emanating prompt the colossal shape and form. In this regard various researches have already been undertaken. Accounting innovations of ABC (Al – Omiri & Dury 2007). But seen the in efficacy of most of the surface taken up to evolve a system to address the intricacies and problems in various field viz, pricing, accounting a new craze of consumerism; on set of new preferences and attitudes that pradically make immense on the market pollution and performance. Managerial Accounting research has already investigated factors that lead to accounting innovations like ABC, yet it hardly provides the much needed capability to cope up with the complicities issues like pricing controlling and budgeting in the presence form of organisational set up. The present paper hence intends to evolve a system through which a balance between ‘adoption’ and performance could be established as matter of fact these accounting innovation need to be made more realistic; it needs to be more penetrative in ordered to make inroads and map the much needed adoption.

A key factor of the fast spread of the balanced scorecard was the possibility of using a measuring system to control the implementation of company vision and strategy. Through this the Balanced Scorecard

took up the role of a strategic management system (De Geuser et al., 2009).(cited in Zizlavsky,2014).

The BSC model has been applied as a dynamic method of measuring performance and as a means to adapt to both internal and external changes, thereby serving as a technique for long-term strategic planning for an organization (Ibrahim, 2015). The Balanced Scorecard (BSC) is an important recent administrative innovation in management accounting which is supposed to enable top management to understand, measure and manage their companies' key organizational processes resulting in an improved competitive market position and company performance (Kaplan and Norton,1992,1996,2001,2004).Despite the fact that management accounting research has investigated factors that affect accounting innovations like ABC (Al-Omiri and Drury 2007). Little research has been undertaken towards understanding the factors that affect accounting innovations (BSC). Also, the research suggests that this concept is widely used in large organizations in the United States and throughout Europe. As such 20-30% of the larger firms have adopted the BSC (Ittner, et al, 2003; Speckbacher, et al, 2003). However, Little has been learnt as to whether BSC innovation can be implemented successfully in organisations operative in developing countries. In addition, the management accounting literature advocates that there is no universally established accounting system applicable to all organizations in search circumstances and that the choice of an accounting system should be made contingent to the circumstances faced by organizations. In order to explain the diversity of management accounting practices, researchers have adopted a contingency theory that explicitly identifies those aspects of an accounting system that are associated with certain defined circumstances which to demonstrate an appropriate matching (Otley, 1980).

Therefore a considerable amount of contingency based accounting research has been undertaken focusing on a variety of aspects relating to management accounting control systems (Chenhall, 2003). The research has generally concentrated on the information extracted from the accounting system and how it is used for control purposes (e.g. dimensions of budgeting such as participation and importance of meeting budgets, reliance on accounting performance measures and dimensions of information extracted from the system such as scope, timeliness and aggregation).

2.Review of previous studies

In Competitive environment, firms need to be prompt and flexible. As a result, accessibility of the right information at the right time, for decision making and performance evaluation, has become a subject of new research. Adoption of BSC helps managers understand the interrelationships and tradeoffs between alternative performance dimensions, which lead to improve decision making and problem solving (Banker et al., 2004; Kaplan and Norton, 1992). Evidence demonstrates that in 2001, the BSC had a utilisation rate of 44% worldwide: 57% in the UK, 46% in the US, and 26% in Germany and Austria (Rigby, 2001). As a result, firms were prompted to analytically search for factors that could enable them to adopt and sustain the BSC.

(Banchieri et al.,2011) mentioned that BSC as a tool well known in both the professional and academic literature , during the year 2008 , the BSC was ranked the sixth most widely used management tool, as it was used by 53% of 1,430 companies. This percentage was significantly higher than that of the other tools, while the level of satisfaction for the BSC is at the average for all management tools (Rigby and Biladeau, 2009). Another interesting fact for appreciating the tool's market penetration is that 40% of Fortune magazine's 1,000 top companies used the BSC model in 2007 (Thompson and Mathys, 2008).From its creation in 1992 until July 2010,309 articles containing "Balanced Scorecard" or the abbreviation "BSC" in the article title or abstract have been written and included in the Institute for Scientific Information (hereinafter ISI) database (Banchieri et all (2011).

It can be assumed that the research concerning the factors related to BSC is fragmented. In general, many authors have examined some factors related to BSC implementation, based on both primary and secondary sources of data (e.g. Lingle and Schiemann, 1996; Kaplan and Norton, 2001; Doran et al., 2002; Kennerley and Neely, 2002; De Waal, 2002; Ho and McKay, 2002; Johnston et al., 2002; Franco and Bourne, 2003; Radnor and Lovell, 2003; Hackett Group, 2004; Fernandes et al., 2005; Papalexandris et al., 2005),

Therefore, since the BSC is still relatively a new phenomenon and still has many problems or shortcomings associated with it; it is crucial to observe what other researchers and practitioners have done in order to analyze the most critical factors required for BSC to be im-

plemented successfully. Consequently, the present paper provides a comprehensive analysis of 280 companies operative in the KSA environment.

Both the professional and academic strategy literature claim that many firms have found traditional performance measure to be insufficient guides for decision making in today's modern changing environment where manufacturing environments have changed a great deal since the Industrial Revolution, especially during the last two decades of the twentieth century. One of the greatest changes has been the emergence of intensive global competition. Pressure from Japanese markets led to an increase in competition at the beginning of the 1980's. These changes led to criticisms of management accounting and calls for a management accounting revolution (Johnson and Kaplan 1987a). **They state:**

'Given the radical changes in the competitive environment …and rapid world-wide movement of technology and capital, it is unlikely that the cost accounting and management control systems devised for the 1925 environment can still be useful sixty years later'.

The innovation of the balanced scorecard seems to be the latest management fashion to swept organisational world. After its introduction in the early 1990s, it has attracted considerable interest among firms in recent years. The large number of seminars evidences this and workshops devoted to the issue, including a number of cases presentations by companies that have adopted BSCs. Kaplan and Norton (1996) argue that the BSC is not primarily an evaluation method, but also is a strategic planning and communication device to; Provide strategic guidance to divisional mangers; Describe links among lagging and leading measures of financial and non-financial performance.

The BSC was initially described as a performance measurement system containing both financial and non-financial measures. The measures of the BSC span four areas: financial performance, customer relations, internal business processes, and the organization's learning and innovation activities. One of the core ideas in the early writings was to tie the measures in the BSC to an organization's strategy (Kaplan and Norton, 1992).

Regardless to the survey studies (Pere, 1999) suggests that balanced measurement systems, both BSCs and others, are already widely used in large companies and their business units located in Finland. in this study , 31% of the respondents claimed indicates that they have such a system and 30% were implementing one. Similarly, a survey conducted in the USA estimates that 60 percent of the Fortune 1000 firms have experimented with BSCs (Silk, 1998).

More recent writings on the BSC stress its development from an improved performance measurement system to a strategic management system (Kaplan and Norton, 1996a, 1996 b). In addition to linking measures to vision and strategy, measures should now be linked to each other, following a series of cause-and-effect relationships. Moreover, strategic management systems involve use of BSCs for goal-setting, compensation, resource allocation, planning and budgeting, and strategic feedback and learning. Braam & Borghans (2009) used data from 149 companies listed on the Dutch stock market and examined the influence of interlocking directorates on the use of the BSC as a strategic performance measurement tool in the companies' annual reports, they investigate the role of the interlock ties of executive and supervisory board members in supporting use of the BSC, and how this role was affected by the positions of the members in the board, they concluded that the experiences of board members with similar decisions in other companies affect firm's use of the BSC.

On the other hand, the BSC has attracted relatively little criticism. Butler et al. (1997) considers Kaplan and Norton's model to be too general. They point out that it may not fit the firms culture and jargon. They also feel that BSCs may ignore corporate missions; in situations where employees accept the company mission it would be better to build metrics on that mission instead of importing an unfamiliar concept from outside the company.

Laitinen (1996) in turn considers the selection of (four) basic dimensions and their interrelationships problematic. He claims that measures in practical applications appear to be loosely connected to each other, being unable to provide any clue about which firm-internal factors should be developed to achieve success in the marketing and in financial terms.

Norreklit (2000) has similarly questioned the existence of a causal relationship between the four areas of measurement. Moreover, she questions the validity of BSCs to serve as a strategic management control tool. Epstein and Manzoni (1997) question the ability of firms to agree on a strategy in such clear terms that it would enable construction of a BSC. They also feel that maintaining such a system might prove burdensome and incomprehensive

Vaivio (1995) in turn questions the idea that a handful of quantitative measures can portray the various facets of a company's strategy. In addition to such criticism, a few authors have questioned the novelty of the idea (cited in Malmi 2001). For example, the French are known to have used a somewhat similar system called Tableaux de Bord for decades (Lebas, 1994; Epstein and Manzoni, 1998; see also Lynch and Cross, 1991). Moreover, the idea of linking measures to strategy is not unique to the BSC (McNair et al., 1990; Beischel and Smith, 1991; Grady, 1991).

Recently , a study by Nisha (2017) examined the underlying hypotheses of the BSC model and how they can be used for performance evaluation by focusing on the banking sector of Bangladesh. The Results indicated that there is a positive correlation among the BSC perspectives at a statistically significant level and in a sequential way for the selected banks. Findings of the study particularly highlights that banks which have experienced improvements in their selected financial indicators like ROA, ROE, had evidently increased their efforts towards the characteristics under the learning and growth, internal business process and customer perspectives. In addition , Al-Alawi (2018) undertaken a study to measure the performance of online banking and to focus on how to cultivate the strategic model map in the Bahraini financial sector. He used the qualitative method with the semi-structured interview questions classified into three main elements covering the financial sector: Strategic Vision and Mission, Strategic Objectives based on the four perspectives of Balanced Scorecard (BSC), and the Online Banking Performance Measurement System. Three local banks participated out of 11 conventional retail and Islamic retail banks in Bahrain. The study provides a basis for integrating measures of the BSC and offers guidelines for implementation of a performance management system and how to adjust the stra-

tegic model map to fill the existing gaps. A generic online banking strategy model map is formulated to show the strategic objectives and relevant measures of the scorecard perspectives. Representatives of major banks in Bahrain were interviewed to explore the ways in which they measure the performance of their online banking divisions. The study concludes by proving a list of recommendations to the financial sector.

3.The need for further studies

This study was motivated by an observation made in a review of the accounting performance measurement literature:

"…the use and performance consequences of these [BSC] measures appear to be affected by organizational strategies and the structural and environmental factors confronting the organization. Future research can make a significant contribution by providing evidence on the contingency variables affecting the predictive ability, adoption and performance consequences of various non-financial measures and balanced scorecards." (Christopher et al. (1998) (pp. 223-224).

In addition, most research on BSC and its applications has mainly been focused on organizations in developed countries. To the best of our knowledge, no such empirical study has still been undertaken to investigate adopt and applicability of BSC of Saudi companies or little has been learnt as to whether BSC techniques can be implemented successfully in organizations operative in developing countries**.**

This paper contributes towards filling the gap in the literature in KSA environment. Such a study is imperative Saudi environment which may prove informative for other GCC countries such as Bahrain, Kuwait, Oman, Qatar and the UAE. In addition, this study can also open the door for more research in terms of management accounting innovations and others such as; ABC, TQM ;JIT and so on in such a enrich our new environment.

The major aims of the research are to examine the following issues:

1.To discover to pattern of the diffusion rate of BSC in the KSA environment

2.The extent to which different potential explanatory factors influence adoption and implementation of BSC.

4.Variables and Hypotheses:

4.1. Size and BSC

There is debate in the literature about the influence of size of firm on BSC implementation. Some researchers suggest that firm size can affect the design and use of management control systems. Merchant (1984) argues that organizational growth poses increased communication and control problems. In addition, larger firms may have greater access to the resources needed to implement more complex systems (Shields, 1995). Libby and Waterhouse (1996) find that the number of changes made to a management control system is positively related to firm size. In their review, Moores and Chenhall (1994) find there is considerable evidence that size is an important factor related to the adoption of more complex administration systems. Welsh and White (Welsh 1981) observed that small businesses were not 'little' large businesses, and that the differences in structures, policy making procedures, and utilisation of resources were such that "the application of large business concepts directly to small businesses may border on the ridiculous". Many researchers have argued that organizational size facilitates innovation (Aiken and Hage, 1971; Kimberly and Evanisko 1981; Ettlie *et al.*, 1984). Large organizations have more complex and diverse facilities that aid the adoption of a large number of innovations (Nord and Tucker, 1987). Previous empirical studies have noted a positive relationship between company's size and the adoption of innovations (Blau and McKinley, 1979; Dewar and Dutton, 1986 and Damanpour 1992). There is also evidence to indicate that size is an important factor influencing the adoption of more complex administration systems (Moores and Chenhall, 1994).Hoque and James (2000) report that large organizations depend on sophisticated information and control systems using diverse measures, and find the use of BSC to be increasing with organization size. By design, the BSC represents an integrative management tool useful for coordinating

Cross-function and cross-level decisions and activities. Joshi (2001) observed that the adoption of BSC was related to company size. Also In recent study by Quesado et al,. (2016) found indicates that the organizational size are positively associated with the implementation of the BSC.

In conclusion of the influence of size many studies have analyzed the influence the size of the company on the adoption of the BSC. However, mixed results were obtained . Some studies found that the adoption of the BSC is significantly and positively associated with the size of organizations For example (Joshi (2001; Bedford , Brown , Malmi and Sivabalan ,2008; Braam and Nijssen,2004; Hendricks et al.,2004, 2012; Hoque and James,2000; Pineno,2004; Speckbacher et al .,2003 ; Tapino, Dyson,and Meadows, 2011; Wagner and Kaufmann,2004 ;and Quesado et al, (2016) vise versa other studies corroborated that the company size does not affect the use of BSC for example (Hoque, Mia, and Alam,2001; Quesado and Rodrigues,2009) .

Therefore, we could say that the larger organizations have more resources to develop innovative systems and they are more likely to be able to implement BSC systems.

Therefore, the following hypothesis is formulated

Hypothesis 1 (H1): There is a positive association between the firm size and the adoption of BSC.

4.2.The level of competition environment and BSC

Several studies in contingency theory (e.g. Hemmer, 1996; Hoque & Hopper, 1997; Khandwalla, 1972, 1974; Krishnan, 2005; Krishnan et al., 2002; Libby & Waterhouse, 1996; Merchant, 1984) suggest that today's firms need management accounting and control systems (MACS) that can provide timely, accurate and relevant information on a wide range of issues, including product costs, productivity, quality, customer service, customer satisfaction, and profitability. Kaplan (1995, p. 6) **suggests that:**

"The new competitive environment demands much more accurate cost and performance information on the firm's activities, processes, products, services, and customers."

Kaplan, (1995, p. 6) further argues that in competitive environments, managers must also have timely and accurate information to guide their learning and improvement activities; information that will

help make processes more efficient and more customer-focused. Traditional management accounting and control systems provide mainly financial, quantitative and historical information, which is often found inadequate for performance evaluation, planning and decision-making in today's environment of global competition. Consequently, there have been calls for developments in management accounting and control systems that assist firms to adapt to the changed business environment (Bromwich, 1990; Bruggeman & Slagmulder, 1995; Cavalluzzo, et al, 1998; Hemmer, 1996; Kaplan, 1995; Miller & O'Leary, 1990; Young & Selto, 1991). Bromwich (1990) asserts that management accounting and control systems should be changed or developed to focus on a firm's value-adding activities relative to its competitors. Similarly Hemmer (1996) argues that a significant catalyst for initiating such change is an increase in foreign competition. The work by Libby and Waterhouse (1996, p. 140) reinforces the view that increasing market competition provides an incentive for changes in management accounting and control systems Krishnan (2005) has found a positive association between competition for price and demand for accounting information. There is also there is another dimension of the view that in rapidly changing market conditions, the firm's management accounting and control systems should be adaptive and therefore, change in management accounting and control systems would be necessary (Chenhall, 2003; Chenhall & Chapman, 2006; Hoque, et al, 2001; Mia & Chenhall, 1994).(cited in Hoque,2011, p.268).

According to Hoque et al. (2000) one likely determinant of the use of multiple performance measures is competition confronted by the firms in the marketplace where they operate. Lynch and Cross (1991) and Hoque et al., 2000) found an association between firm's usage of multiple performance measures with competition. Lynch and Cross (1991) recommend that such measures advance competitiveness through clearly examining the organisation's static competence such as efficient production, meeting deadlines, and acquiring dynamic competence.

The extant performance measurement literature states that competition in an industry expedite businesses within the industry to set up analogous performance measures and to be a leader in its industry, a firm has to offer best product quality and present the customer with value for money (for example, see Cooper, 1995; Defond and Park,

1999; Hoque et al., 2001) which is achieved only in the event of integrated and coordinated organisational efforts (Nanni et al., 1992). That is to say, organisational standing in offering superior customer service, better product quality coupled with constant products or service innovation necessitate communal as well as synchronized initiatives by all parts of an organisation. Hoque et al. (2000) elaborated that the more the integration and coordination of efforts, the greater would be the need for a sophisticated control tool such as the multiple performance measurement system, which can provide firm-wide models (or benchmarking) of performance. Academic researchers (e.g. Jusoh and Parnell, 2008; Kaplan and Norton, 1996; Ittner and Larcker, 1998; Otley, 1999; Hoque et al, 2000; Miles and Snow, 1978; Merchant, 1984; Simons, 1995) asserted that performance measures encompassing both the financial and nonfinancial performance of firms that address customer satisfaction, innovation coupled with quality production over and above financial results, are crucial to achieve competitive advantage. Other researchers (Veen-Dirks et al, 2002; Lynch and Cross 1991; Kaplan and Norton, 1996, 2001; Otley, 1999) also supported this view. Kaplan and Norton (1996) cited that multiple performance evaluation emphasise not only on achieving economic objectives such as return on investment, net earnings, sales growth, but also includes the performance drivers such as customer satisfaction, innovation and efficiency, and employee satisfaction of the financial objectives. However, the intensity of using multiple measures might be driven by the degree of competition a firm confronts over time (for review see For example, Hoque et al., 2001; Simons, 1991). Hoque et al. (2000) illustrated that the use of multidimensional performance measurement systems change according to the degree of competition, not the mere presence of information across multiple dimensions (which may still be present in firms experiencing lower competition). According to Kaplan and Norton (1996), the integration (or balance) between financial and non-financial measures in the performance measurement system is believed to be indispensable for the firm's long-term triumph in today's competitive environment.

Therefore, the following hypothesis is formulated

Hypothesis 2(H2): There is a positive association between the intensity of competition and the adoption of BSC.

4.3. Total Quality Management and BSC

There is an evidence suggests that firms that are more innovative in technical areas also tend to be more innovative in administrative areas, and vice versa. (Damanpour and Evan, 1984). Thus, firms that have implemented total quality management approaches are likely to be more innovative technically than other firms and therefore tend to adopt more administrative innovations like BSC. With today's global competitive markets, the demand of customers is increasing, as they require improved quality of products and services. A continuous improvement in organization activities with a focus on the customer is the main aspect of quality and its management. An important issue related to quality is total quality management (TQM), which is considered to be one of the most important components of advanced management practices. TQM promotes involvement of the entire firm in continuously improving quality. Some studies claimed that 20% of UK firms believed that their TQM programmes had significant impact on performance , and more over 500 US executives showed that 30% believed that their TQM programmes had made a competitive difference (see McAdam and Bannister, 2001). (Kaplan, 1983; Chenhall, 1997) argue that the conventional financial performance measures are inappropriate in TQM settings. Some researchers (e.g. Banker et al., 1993; Perera et al., 1997; Ittner et al., 1997) advocate the use of non-financial performance measures in firms adopting TQM initiatives. McAdam and Bannister (2001) argued that business performance is linked to TQM implementation. In their study they concluded that firms applying TQM should incorporate financial and non-financial performance measures. In the same context, Chenhall (1997) conducted a study that examined the reliance on manufacturing performance measures to evaluate managers' performance. They concluded that such reliance could enhance the profitability of organizations pursuing TQM. The results of the study showed the association between TQM and performance was stronger when using manufacturing performance measures. Attempting to address the empirical research in this area, Ittner and Larcker (2001, p. 378) summarized the related research concerning the advanced manufacturing technologies and the performance measurement systems. **In this context, they state:**

In general, organizations following advanced manufacturing strategies such as just in time, total quality management and flexible manu-

facturing are positively associated with the provision of non-financial measures and goals such as defect rates, on-time delivery and machine utilization, as well as greater emphasis on non-non-financial measures in reward systems. But empirical support for the hypothesized performance benefits from these measurement practices is mixed.

Malmi (2001) found that one of the important reasons to encourage balanced scorecard adoption in Finland is the application of TQM. In this regard , Kaplan ,(2010 .p 8) mentioned that some authors went further when they urged that internal reporting of financial information to managers and employees, especially those tasked with improving operations by continuous improvement of quality, process yields, and process cycle times, be abolished .

"Managing with information from financial accounting systems impedes business performance today because traditional cost accounting data do not track sources of competitiveness and profitability in the global economy. Cost information, per se, does not track sources of competitive advantage such as quality, flexibility and dependability. [...] Business needs information about activities, not accounting costs, to manage competitive operations and to identify profitable products (Johnson, 1980, 44-5)".

Basically, these authors argued that companies should focus on improving quality, reducing cycle times, and improving companies' responsiveness to customers' demands. Doing these activities well, they believed, would lead naturally to improved financial performance. **Therefore, the following hypothesis is formulated:**

Hypothesis 3 (H3): There is a positive association between the use of TQM and the adoption of BSC.

4.4. Innovative/strategic management accounting techniques and applicability BSC

The innovation management accounting techniques such as target costing, strategic management accounting, contribution margin analysis and life cycle cost analysis are all well known examples of management accounting techniques **(**Ana et al **,**2010**)**. It has been said that the contingency-based approach to research assumes that management control systems are adopted to assist managers in achieving organizational goals, and that the appropriate design of a management control

system is contingent upon the environment, or context, in which it operates (Chenhall, 2003). Baines and Langfield-Smith (2003, p. 679) point out that in a lean manufacturing environment, "traditional cost control systems, which focus on variance analysis, aggregating costs, and accounting for inventory, do not effectively identify resources consumed, or help managers manage those resources. In addition, they may distort the realities of manufacturing performance with new technological processes".

In the early stages of the lean transformation in the U.S., the literature recognized the need to adapt and expand traditional MAS to fit the new environment (e.g., Fisher, 1992; Johnson & Kaplan, 1987; Kaplan, 1983) . To support continuous improvement, management control systems should be open and informal, broad in scope, and include benchmarking and links to strategy and operations (Rosemary and Wempe ,2009). Also , ABC is often linked to other strategic and business initiatives that are likely to complement and enhance each other, rather than being individually necessary and sufficient for improvement(Cooper and Kaplan,1991). In particular, studies indicate that improvements in costing systems have been implemented to reconcile management accounting information with other advanced management practices(Anderson,1995). According to Swenson(1995). linkages with other initiatives provides a ready application for the ABC information. Krumwiede (1998). also reported that firms linked ABC to other improvement initiatives (e.g. target costing, benchmarking of activities and value chain analysis) because of their need for more accurate product/activity costs. Thus, other initiatives may act as catalyst for replacing simplistic costing systems with more sophisticated ones (Innes and Mitchell,1990).

Therefore, the following hypothesis is tested:

Hypothesis 4 (H4): There is a positive association between the use of Innovative/strategic management accounting techniques and the adoption of BSC.

4.5. Perceived environmental uncertainty

PEU is one of the external factors that affect firm performance (Jusoh, 2008) . Al-Naser & Mohamed(2017) mentioned that the use of multiple performance measures provided by the BSC approach can play a significant role in providing internal and external broad based

information. They found a positive relationship between PEU (e.g. intensity of competition) and BSC. The researchers in management accounting and control systems argued that managers that realize the importance of environmental uncertainty give greater importance to management accounting systems (Al Malawi, 2015; Hoque, 2004). The contingency-based literature concluded that external environment is a key influential factor on choice of the design of control and performance measures (Chenhall, 2003; Fakhri, 2012). King et al. (2010, p.45) argue that "PEU is seen to be an important contextual factor in the design of MCS because increased PEU makes managerial planning and control more difficult".

The findings from several studies (Gordon & Miller, 1976; Gul, 1991; Govindarajan, 1984; Schulz et al., 2010) report that high environmental uncertainty results in the use of broad scope information (i.e. financial and non-financial).Chenhall and Morris (1986) find a positive association between perceived environmental uncertainty and the demand for broad-based information systems incorporating non-financial indicators. Gosselin (1997) finds that environmental uncertainty influences the decision to implement activity-based costing. Ivey & Menor*(2004)*examined contingency factors affecting the adoption of the BSC using a combination of survey and archival data and they found significantly related to firm strategy, firm size, and environmental uncertainty. Banker et al. (2001) show in their study that firms employing a Balanced Scorecard to measure their performance face a reduced level of PEU. However, Verbeeten (2004), Zuriekat (2005), Zhu et al. (2009) and Jusoh (2010) have concluded that PEU has no a significant influence on the use of MPMs. Also, Hoque2004). found no evidence of a significant relationship between environmental uncertainty and performance through management's use of non-financial performance measures.

Hypothesis H8: There is a positive association between the perceived environmental uncertainty and the adoption of BSC.

5. Research methods and data collection

This research discovers the pattern of the diffusion rate of BSC in the Saudi Arabia firms the extent to which different potential explanatory factors influence the adoption and implementation of BSC. A survey was designed to fulfil our aims and mailed out to the partici-

pations in April 2014. The survey package included a questionnaire with a personalized cover letter and a postage-paid, self-addressed envelope. The full questionnaire was developed based on those used in prior research. Prior to mailing the final version of the questionnaire a pilot study was undertaken in two stages .First stage , pilot tests of the instrument were initially undertaken with a group of university academics, managers and management accountants. Before the survey instrument was mailed to the organisations under investigation, its content validity was addressed by asking a group of management accounting lecturers and postgraduate students with companies experience to review the instrument for clarity and meaning and to refine the design and focus of the content further. Stage two , the pilot questionnaire was mailed to 15 companies and 8 replies were received. Based on the responses to the pilot survey, appropriate modifications were made to the final version of the questionnaire. These related mainly to the clarity of the questions and the layout of the questionnaire. The final version of the questionnaire excluding the front covering page. The first page included guidance notes to facilitate answering some of the questions. The personalised letter requested the addressee to participate in the survey by answering the questionnaire himself or for another knowledgeable person to answer the questionnaire. Respondents were assured that their anonymity would be preserved. The procedure was undertaken to increase the response rate and the accuracy of the survey responses. A follow-up package was sent six weeks later. in addition email address was used when was applicable for some companies and was used for follow up process as well .Various tests for non-response bias were undertaken. They involved comparing the replies of the early and late respondents based on the assumption that late respondents more closely resemble non-respondents. There was no evidence of non-response bias. In conclusion , Around 900 questionnaires were sent to the firms and ,515 questionnaires were completed , with response rate around 57%[1]

[1] This study contain services companies and manufacturing companies were excluded .

6. Measuring the extent of BSC adoption

It is difficult to find out a reliable statement that can be made about the degree to which Balanced Scorecard need to be implemented (Speckbacher et al., 2003). According to Malmi (2001), it is difficult to determine whether the company has or not implemented the BSC due to the evolving nature of the BSC. Also, it should be noted that many of the balanced scorecard concepts and relationships are fairly open to different interpretations (Norreklit, 2003; Ax and Bjomenak, 2005).Therefore, there arguably is no perfect measure to measure the implementation of BSC in the companies the conceptualisation of the applicability extent of balanced scorecard usage is problematic and that the literature lacks an optimal way to determine the degree to which balanced scorecard has been implemented by companies. However, several researchers (e.g. Ittner, Larcker and Randall, 2003; Nielsen and Sorensen.2003) have measured the level of usage of balanced scorecards in their surveys by asking the respondents to self-specify whether their companies operated a balanced scorecard in their performance measurement system. Other researchers (e.g. Hoque and James. 2000) have measured the level of usage of balanced scorecard in their surveys by asking the respondents to indicate the extent to which several financial and non-financial performance measures were applied based on Kaplan and Norton original four perspectives.

In recent study , (Ax & Greve, 2017) used five stages to measure the adoption of BSC (1) We have not used the BSC in the past and have no plans of adopting it; (2) We have used the BSC in the past but have abandoned it; (3) We have not used the BSC in the past, but a decision has been made to adopt it; (4) We use the BSC somewhat today; and (5) We use the BSC extensively today.

In this research , we used seven stages to describe BSC (these seven stages were adopted from (Al-Omiri & Drury ,2007) they used nine stages for ABC adopting, in this research , we modified them to be applicable for BSC .These stages try to indicate which of various non-adoption/adoption/implementation stages best described their business unit's current situation. (A) BSC not considered, (B) BSC considered then rejected, (C) BSC considered , BSC (D) approved for implementation, (E) BSC implementation is in process ,(F) BSC implementation is complete &is in the process to gaining acceptance

and (G) BSC implemented &generally accepted. The stages (A; B; and D) represent non-adoption and stages (D ;E;F; and G) represent BSC adoption (see table 15).

7. The influence of potential explanatory variables on adoption of BSC

In order to test the hypotheses specified in section 4 the following model was applied in respect of **the BSC adoption and non –BSC adoption as a dependent variable :**

$$Y = b_1 + b_2\,COSTIMP + b_3\,SIZE + b_4 TQMA + b_5 INOVMAT + PEU + e$$

where:

Y = BSC adoption and non –BSC adoption as a dependent variable

COMPET= Intensity of the competitive environment

SIZE = Size measured by annual sales turnover logarithmically adjusted for the observed non-linearity.

TQMA = Extent of the use of total quality management approaches

INOVMAT = Extent of the use of innovative management accounting techniques

PEU= perceived environmental uncertainty

7.1. Measurement of the independent variables

For the size (capital, annual sales turnover) , factual measure was used. Respondents were enquired of the capital and the annual sales turnover of their business unit. Seven point ordinal Likert scales were used to measure the remaining variables.Wherever possible composite scores derived frommultiitem questions were used.**Details of the number of questions used for each variable and the Cronbach alpha scores are as follows:**

Table 1: Descriptive statistics and p-values and Details of questions used and Cronbach Alpha scores for hypotheses relating to potential explanatory variables influencing the adoption of BSC systems

Hypothesis/ independent variables	N questions	Cronbach Alpha	BSC adoption companies	Non-BSC adoption companies	P-value[a]
H1: Intensity of the competitive environment	7	.88	108	172	0.000
H2: Size of the organisation	2	n/a	108	172	0.000
H3: Extent of the application of total quality management approaches	5	.81	108	172	0.000
H4: Extent of use of innovative/strategic management accounting techniques	7	.95	108	172	0.000
H5: Perceived environmental uncertainty	8	.94	108	172	0.000

Notes

[a]. P-values are based on the Mann-Whitney test for the ordinal scale. Variables (1 ,3 ,4and5) were measured on an interval scale and variable 2the p-values were derived from the t-test for variable 2.

All of the Cronbach alpha measures were above the generally accepted minimum criterion level of 0.6 (Nunnally, 1978). Composite scores were used to measure the variables with a Cronbach alpha exceeding 0.80

8. Research findings

To test our hypotheses , Chi-Square-Test ;Mann-Whitney ; T – test .The p-values reported in Table 1 are for variables measured on interval or ordinal scales. The p-values and summary statistics for each of the variables examined for BSC adopters and non-adopters are shown in Table 1. This table indicates that the significant differences were observed between non- BSC adopters and BSC-adopters in respect of the following variables

Size (SR| million)

The extent of use the total quality management

The extent of use the innovative/strategic management accounting techniques

The level of competitive environment;
perceived environmental uncertainty

9.1 Description and hypotheses tests :

Table 2;3&4: insert in somewhere here

It can be seen from Table 2 that 29 companies less than SR 10 m represent 10.4% , 67 companies from SR10-SR20m 23.9% ,94 companies from SR21-SR30m about 33.6% ,87 companies from SR31-SR40m around 31.1% and 3 companies Over SR50m (1.1%).Table 3 also indicates that 10.7% of the respondents had an annual sales turnover of less than SR100 million, 20.3% had a turnover between 100 SR million to less than 200 million and 68.9% had a turnover exceeding SR200 million. Table 4 also indicates that 31.5% of the respondents had less than 400 employees, 19.3% had 400 to less than 600 and 49.2 % had more than 600 employees.

Table 5;6,7;8;910;11;12;13;14 and 15: insert in somewhere here

In addition , **the table 5** shows that some companies have a number of limited product or services around (43) (15.4%) and 237 companies have a huge number of product or services(84.6%).From the **table 6** it can be seen that some companies used a fully automated (179)(63.9%),34 companies considered as average automated(12.1%) and 67 companies considered as little automated (23.9%).

Table 7: shows us the age of our respondents, 33.6% participants less than 30 years ,17.5% between 31 to less than 40 years ,40.0% between 40 to less than 50 years and 8.9% over 50 years.

Table 8: shows the Information relating to Qualification of the respondents academic degree, the 29 respondents hold a PhD degree (10.4%),44 persons has a master degree (12.5%) , 35 respondents have provisional certificate such as(CPA,CA,SOCPA,CMA)(26.4%),55 respondents have High diploma (19.6%) and 117 has a Bachelor Degree(41.8%) .

Table 9: shows the Information relating to the field or major of degrees of the respondents, the 111 Accounting degree (39.6%) , 34 Business Administration (12.1%),19 respondents have Economics (6.8%),13 respondents have a Finance (4.6%) , and 103 respondents choose other (36.8%).

As we can see form **the table 10** that job title of the respondents are 106 as a director of finance(37.9%),44 finance managers (15.7%), 20 Financial controllers(7.1%),28 management and cost accounting managers (10.0%),59 Head of accounting departments (21.1%), 6 Executive managers (2.1%),4senior managers (1.5%) and 13 accountants (4.6%) .

The table 11 shows the working experience of the respondents, 11 respondents has experience less than 2years (3.9%) , from 2-5 years around 34 respondents (12.1%) , 6-10 years 142 respondents (50.7%) , 11-15 years 44 respondents (15.7%) and 16-20 years 26 respondents (9.3%) . and above 20 years 23 respondents (8.2%).

The table 12, show the level of BSC implementation,11 companies has implemented BSC at cooperate level (10.2%),13company has implemented BSC at Business unit level (12%)36 companies has implemented BSC at Department level (33.3%),43 companies has implemented BSC at team level (39.8%) and 543 companies has implemented BSC at Employee level (4.6%).

BSC level	**N**	**%**
cooperate level	11	10.2
Business unit level	13	20
Department level	36	33.3
Team level	43	39.8
Employee level	5	4.6
Total	108	100.0

It can be seen from the above table12 that the 11 BSC companies (10.2%) apply this approach at the business unit. This is consistent with Kaplan and Norton's (1996c) idea, in which they argued that the BSC should be primarily applied at the business unit level where the competitive strategies become essential. Empirically, this result agrees to some extent with the findings of Speckbacher et al. (2003), in which they reported that almost of the companies apply this approach at the business nnit level. Table 12 shows that approximately 11.2% of the BSC companies reported that they had implemented this approach at the corporate level. This result is in line with the recommendation of Lawson et al. (2003a) that companies could implement the BSC for corporate level first and then roll out this approach

to other organisational levels. Similar results, however, have been reported in relation to survey studies, for example, Speckbacher et al., (2003) found that 55% of the companies apply the BSC at the cooprate level.

In the first step we analyzed the size of all companies that had implemented a Balanced Scorecard versus the companies that hadn't implemented BSC. Two measures were used (the capital and annual sales turnover) there is significant differences between BSC adoption and non-BSC adoption . Consistent with this notable gap between the mean annual sales turnover we found a significant association of size and BSC implementation ; larger companies are more likely to use the BSC concept. This finding complements with study of Hoque and James (2000) who surveyed 66 Australian organization companies and found that BSC usage is positively associated with organizational size. This results also complements a recent study of , Speckbacher et al., (2003) In German-speaking countries (Germany, Austria, and Switzerland) 201 companies that were included in their survey.) They found the same results.

Using a Chi-Square-Test,,we compared companies which have adopted a BSC of and companies which haven't. We found a significant difference in BSC adoption rates according to the two variables (Capital and annual sales turnover)

	% BSC adoption	% non-BSC adoption	Total
N	**108**	**172**	**280**

The chi-square test indicated that there was a significant difference in BSC adoption rates ($P < .01$).Findings of this research indicates consistent support for size influencing the adoption and influencing the adoption of BSC.

Table 1 provides descriptive statistics for all variables. The contextual variables ; total quality management; competition environment ; and company size are significantly with BSC adoption.

Also , Logistic regression analysis with the dichotomous variable BSC/non-BSC as the dependent variable was used as in the table 14.

This table indicates that the significant differences were observed between non- BSC adopters and BSC-adopters in respect of the following variables
Size (SR| million)
The extent of use the total quality management
The extent of use the innovative/strategic management accounting techniques
The level of competitive environment;
perceived environmental uncertainty

9.2 The extent to which other accounting innovations and strategic management accounting practices are associated with the adoption/non-adoption of BSC

To discover the extent to which other accounting innovations and strategic management accounting practices are associated with the adoption/non-adoption of BSC, the author asked the respondents about other accounting innovations and strategic management accounting practices, this question sought to ascertain the extent to **which the followinginnovative/strategic management accounting techniques were used:**

- value chain analysis;
- activity based costing
- shareholder value analysis;
- benchmarking of operational processes, management processes or support activities with outside organisations;
- competitor cost assessment;
- strategic costing involving the use of cost data based on strategic and marketing information to identify superior strategies that will sustain a competitive advantage, and
- target costing.

The responses are listed in Table 8.14. It can seen that the mean score for the BSC adopters was in excess of 4 (sometimes used) in respect of the extent of use value chain analysis; activity based costing **;**shareholder value analysis; benchmarking of operational processes, management processes or support activities with outside organisations; competitor cost assessment; strategic costing involving the use of cost data based on strategic and marketing information to identify

superior strategies that will sustain a competitive advantage, and target costing.. In contrast, the mean score for the BSC non-adopters was less than 4 for all items. There was a significant difference in the usage of the techniques listed in Table 8.14 for BSC adopters and non-adopters ($p < .05$ for target costing , one tailed and $p < .01$ for the remaining items, one tailed).

10 .Discussion and conclusion

In the researches held earlier most attention has been paid to the factors responsible for adopting BSC. This paper presents a result of BSC adoption and the factors influencing the adoption of BSC. The key findings and analysis of data derived from survey questionnaire. The interpretations of the results have been guided by previous empirical studies in the context of scrutiny of the relevant literature review. Moreover, the paper has identified a series of critical factors that must be carefully considered to ensure adoption implementation of BSC**.**

In the literature, much attention has been paid by previous research to examining the factors that have influenced firms for adopting BSC. A Little attention has been given for BSC. Where these issues have been examined the studies have relied on single response questions rather than Likert scale questions used by this study. In addition, the paper has identified the level of BSC adoption in KSA service companies.

Hypothesis 1: The size of the company in our study was found to be an important influential factor for adoption of BSC ,this result cope with some studies which suggested that there is a positive a relationship between BSC as innovation and the size of company (Aiken and Hage, 1971; Kimberly and Evanisko 1981; Ettlie et al., 1984; Blau and McKinley, 1979; Dewar and Dutton, 1986 and Damanpour 19-92).the reasons behind that because the large organizational size facilitates innovation . also , this result suggests that as size Increases, firms find it more practical and useful to place greater emphasis on the BSC that supports their strategic decision making, as the BSC incorporates much broader measures of the performance of firms.

Therefore , our results are in line with the previous studies (Joshi (2001; Bedford , Brown , Malmi and Sivabalan ,2008; Braam and

Nijssen,2004; Hendricks et al.,2004, 2012; Hoque and James,2000; Pineno,2004; Speckbacher et al .,2003 ; Tapino, Dyson,and Meadows, 2011; Wagner and Kaufmann,2004; Quesado et al, 2016) .

Hypothesis 2: This study makes several contributions to the management accounting literature. First, the positive association between BSC adoption and competition reported in this paper suggests that when firms face increased competition in the marketplace they tend to adopt management accounting control systems like BSC; this results is comprehensively supported in somehow the pervious studies ,(Lynch and Cross (1991) and Hoque et al., 2000) found an association between firms usage of multiple performance measures coupled with competition.

Hypothesis 3: it appears from the results presented in this paper that there is a noticeable significant relation between BSC adoption and TQM ,therefore , we can say that these the quality management represent an important factors to attractive the companies to adopt the BSC which confirmed Hypothesis 3 .

Hypothesis 4: The findings of this study provide support for a significant relation between BSC adoption and innovative/strategic management accounting techniques. An interpretation of this result is that when companies have many innovations i.e., the management prefer to adopt the new innovative measures to cope with the changes taking place on the behavioural plane in the business environments , the second possibilities are these innovations will be easier the implementation an innovation such BSC.

Hypothesis 5:also , the findings of this study indicates that perceived environmental uncertainty has positive relationship on BSC adoption.

However, this research is subject to a number of limitations. Many of the limitations pertain to those applying to all postal questionnaire surveys. In particular, it is normally not possible for the respondents to explain their respective responses or, query response, 'why?' As the questionnaire was completed by management accountants, who might be involved in designing, implementing and management accounting systems. Therefore it is apprehended that they may have a vested interest in answering positively in terms of questions relating to concept

of BSC theoretically, future research of BSC should focus on users of the performance measurement system.

As a result of undertaking this research it is possible to identify several areas for future research. More in-depth case studies should be undertaken to examine relevant issues that are appropriate to the four dimensions of BSC. Case studies hence seek to explain the far reaching effects of BSC on performance BSC hence can really play the role of a new innovator to give boost to firm performance up to the desire degree. Many limitations can be seen in its in ability to operate in a larger universe as it hardly have reach and access to a larger universe. Hence it would be in fitness of things to established a balanced between adoption and performance.

Despite the above limitations this study has provided additional insights into areas investigated. Considerable efforts have been taken to minimise the limitations and remedy the deficiencies of previous studies. It is hoped that this paper will motivate researchers to undertake further research in the areas suggested.

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Table 2: Information relating to the respondents' Capital

Capital	Number of Cases (N)	Percentage (%)
Less than 10 million	29	10.4
from 10 million - less than 20 million	67	23.9
from 20 million - less than 30 million	94	33.6
from 30 million - less than 40 million	87	31.1
50 million or more	3	1.1
Total	280	100

Table 3: Information relating to the respondents' annual sales turnover

	Number of Cases (N)	Percentage (%)
Less than 50 million	13	4.6
from 50 million - less than 100 million	17	6.1
from 100 million- less than 150 million	23	8.2
from 150 million- less than 200 million	34	12.1
200 millionor more	193	68.9
Total	280	100.0

Table 4: Information relating to the employees number

	Number of Cases (N)	Percentage (%)
Employees number		
Less than 100 employees	17	6.1
100-200 employees	12	4.3
201-300 employees	21	7.5
301-400 employees	38	13.6
401-500 employees	31	11.1
501-600 employees	23	8.2
601-700 employees	121	43.2

701-800 employees	10	3.6
801-900 employees	4	1.4
More than 900 employees	3	1.1
Total	280	100.0

Table 5: Information relating to the respondents' products or services

	Number of Cases (N)	Percentage (%)
a number of limited product or services	43	15.4
huge number of product or services	237	84.6
Total	280	100.0

Table 6: Information relating to the respondents' The degree of automated

	Number of Cases (N)	Percentage (%)
fully automated	179	63.9
average automated	34	12.1
little automated	67	23.9
Total	280	100.0

Table 7: Information relating to the respondents' age

	Number of Cases (N)	Percentage (%)
less than 30 years	94	33.6
30 to less than 40 years	49	17.5
40 and less than 50 years	112	40.0
50 years and more	25	8.9
Total	280	100.0

Table 8: Information relating to Qualification of the respondents academic degree

	Number of Cases (N)	Percentage (%)
PhD degree	29	10.4
Master degree	44	15.7
(CPA,CA,SOCPA,CMA)	35	12.5
High diploma	55	19.6
Bachelor Degree	117	41.8
Total	280	100.0

Table 9: Information relating to the field or major of degrees of the respondents

	Number of Cases (N)	Percentage (%)
Accounting	111	39.6
Business Administration	34	12.1
Economics	19	6.8
Finance	13	4.6
Other	103	36.8
Total	280	100.0

Table 10: Information relating to the job title of the respondents

	Number of Cases (N)	Percentage (%)
Director of finance	106	37.9
Finance manager	44	15.7
Financial controller	20	7.1
management and cost accounting manager	28	10.0
Head of accounting department	59	21.1
Executive manager	6	2.1
senior manager	4	1.4
Accountant	13	4.6
Total	280	100.0

Table 11: Information relating to the working experience of the respondents

	Number of Cases (N)	Percentage (%)
Less than 2 years	11	3.9
2-5 years	34	12.1
6-10 years	142	50.7
11-15 years	44	15.7
16-20 years	26	9.3
Above 20 years	23	8.2
Total	280	100.0

Table12: The BSC implementation level:

BSC level	N	%
Cooperate level	11	10.2
Business unit level	13	12
Department level	36	33.3
Team level	43	39.8
Employee level	5	4.6
Total	108	100.0

Table 13: Responses relating to the extent of the use of various strategic management accounting practices

	N	% rating 1 or 2[a]	% rating 6 or 7[a]	Mean[a]	Standard deviation
(a) Value chain analysis: BSC adopters Non-BSC adopters	172 108	4.1 96	86.8 00	5.01 2.56	.976 .631
(b) Activity based costing BSC adopters Non- BSC adopters	172 108	16.9 73.2	10.5 9	4.61 2.35	1.366 .740
(c) Benchmarking of operational processes, management processes or support activities with outside organisations BSC adopters Non- BSC adopters	172 108	15.7 65.7	66.3 .9	5.22 2.44	1.573 .812
(d) Competitor cost assessment BSC adopters Non- BSC adopters	172 108	16.9 71.3	56.4 1.9	5.53 2.38	1.908 .817
(e) Strategic costing involving the use of cost data based on strategic and marketing information to identify superior strategies that will sustain a competitive advantage BSC adopters Non- BSC adopters	172 108	16.3 70.4	77.4 1.9	5.58 2.39	1.797 .818
(f) Shareholder Value Analysis BSC adopters Non- BSC adopters	172 108	27.3 83.3	53.3 1.9	5.16 2.24	2.110 .772
(G) Target costing BSC adopters Non-BSC adopters	172 108	26.2 83.3	60.5 1.9	5.23 2.24	2.148 .772

Notes[a] Based on a scale of (1) never used to (7) extensively used with the mid-point anchored sometimes used.

Table :14: BSC stages

BSC stages	N	%
(A)not considered	12	4.3
(B)considered then rejected	64	22.9
(C) considered	32	11.4
(D) approved for implementation	25	8.9
(E) implementation is in process	12	4.3
(F)implementation is complete &is in the process to gaining acceptance	9	3.2
(G) implemented &generally accepted	126	45.0
Total	280	100.0

Table 15: Logistic regression analysis with the dichotomous variable BSC/non-BSC as the dependent variable (N = 280)

	Expected sign	*B* (Logistic Coefficien)	Standard Error	p-values [a]	Exp B	Collinearity Statistics Tolerance	VIF
Intensity of the competitive environment	+	.467	.215	.002	.621	.714	1.402
Extent of the use of total quality management ap-proaches	+	.341	.236	.041	.711	.563	1.775
Extent of use of innovative management accounting practices	+	.185	.193	.012	1.204	.508	1.967
Size (Annual sales in SR million)log	+	1.465	.218	.000	4.328	.776	1.288
Environmental uncertainty	+	.067	.149	.010	1.070	.552	1.813
Intercept		9.863	2.006	.000	.000		
Chi-square	.000						
-2 Log likelihood	203.129						
Cox and Snell R^2	.423						
Nagelkerke R^2	.582						
Per cent correctly classified	84.1%						
Hosmer and Leme-show goodness of fit	x^2	df	Sig.				
	8.449	8	.391				