



## RESEARCH REPOSITORY

### Authors Version

Al Sawalqa, F., Holloway, D.A. and Alam, M. (2011) Scope and aims of performance measurement practices: Evidence from Jordan. In: British Accounting and Finance Association (BAFA), 12 - 14 April, Birmingham, UK.

<http://researchrepository.murdoch.edu.au/39600/>

It is posted here for your personal use. No further distribution is permitted

# **Scope and Aims of Performance Measurement Practices: Evidence from Jordan**

**Fawzi Al Sawalqa**

**David A. Holloway\***

**Manzurul Alam**

*Murdoch Business School*

*Murdoch University*

*Western Australia*

**\*Presenting author: [D.Holloway@murdoch.edu.au](mailto:D.Holloway@murdoch.edu.au)**

## **Abstract**

This study provides empirical evidence on performance measures practices in Jordanian industrial companies. It identifies the type and extent of usage of a broad set of financial and non-financial measures. The results indicate that Jordanian companies place more emphasis currently on non-financial measures such as customer response time, on-time delivery, customer retention, employee training, number of new product launches and defect rates. Although Jordanian companies place more emphasis on the use of performance measures to evaluate organisational and managerial performance, they also use them for other reasons. The results also indicate that Jordanian industrial companies still operate under significant institutional and government controls.

**Keywords:** Performance measurement diversity; Non-financial performance measures, Medium and large Industrial companies; Developing country; Jordan.

# **Scope and Aims of Performance Measurement Practices: Evidence from Jordan**

## **Introduction**

Performance measurement is an important management control tool for business firms in the currently competitive environment. It is directly related to the formation of a firm's core competency and has a significant impact on the firm's growth (Xiong, Su & Lin, 2008). Different definitions for performance measurement system (hereafter PMS) exist. Neely (1994) defines PMS as the set of metrics used to quantify both the efficiency and effectiveness of actions (cited in Neely, Gregory & Platts, 2000, p. 1229). In respect to performance measurement, Marshall, Wray, Epstein and Grifel (1999) define performance measurement as a development of indicators and collection of data to describe and analyse performance. To be more precise, performance measurement refers to the use of a multi-dimensional set of performance measures. This set of measures is multi-dimensional if it includes both financial and non-financial performance measures. Both internal and external measures of performance are included and both measures quantify what has been achieved. These measures are used to help predict the future (Bourne, Neely, Mills & Platts, 2003, p. 3). However, Neely et al (2005, p. 1229) define performance measures as a metric used to quantify the efficiency and/or effectiveness of an action.

The usage of performance measures has two dimensions: the level of use or the frequency of use—that is the focus of this study—and the manner of use. The level and manner of performance measurement use relate respectively to an organisation's quantity and quality of application of the measures (Braam & Nijssen, 2004). Improving the PMS is one of management accounting's major roles. However, an effective PMS should include the traditional financial measures and cost-accounting measures used by

senior management and also the tactical-performance measures that are used in evaluating a firm's current level of performance (Chen, 2008).

Most of the empirical research that has focused on issues related to these measurements has overlooked the use of a non-financial dimension of PMS. In this context, Stivers, Covin, Hall and Smalt (1998) argued that although we know much about the use of financial measures, our knowledge of non-financial performance measures is limited. Performance measures usage differs from one managerial purpose to another (Ittner, Larcker & Randallb, 2003). Veen-Dirks (2010) argued that performance measurement literature pays little attention to the purposes for using performance measures. Thus, Franco-Santos et al. (2007) emphasised the importance of researches clarifying the different roles that performance measures play in the firms they were investigating. Franco-Santos (2007) argued that the importance of the relative benefits that firms obtain through using financial and non-financial performance measures has been of particular interest in management accounting research.

The role of management accounting in Jordanian companies has become increasingly important and critical in providing management with appropriate information for decision-making. Knowledge about how Jordanian companies design and use accounting systems is limited. This is because previous accounting research "...has focused on developed countries particularly Europe and northern America, while Jordan (and the Middle Eastern region) has been neglected despite recent changes in its economic and accounting regulatory environments" (Al-Akra, Ali & Marashdeh, 2009, p. 164). Therefore, Jordan and other developing countries in the Middle East are in need of further studies to examine accounting systems such as PMS. However, previous research conducted in Jordan (Zuriekat, 2007; Hawamdah, 2006; Hutaibat, 2005) indicated that Jordanian companies do use multiple performance measures both financial and non-financial. These studies, however, did not identify the relevant

performance measurement instruments or measures in the context of Jordan or other developing countries. This paper extends previous research by building an appropriate multiple performance measurement instrument relevant to the Jordanian business environment.

All the above arguments justify the need for this study which seeks to contribute to the development of knowledge in the field of PMS in Jordan as a developing country and to set out the basis for establishing key performance measures (Ahmad & Dhafr, 2002) in Jordanian industrial companies and to encourage further research in the area. This study extends the previous performance measurement literature by investigating three issues related to performance measurement, namely, extent of use, and the purposes of use. Thus, two primary research questions are investigated:

- 1. What is the extent of usage of financial and non-financial performance among Jordanian industrial companies?*
- 2. What are the main purposes for using performance measures among Jordanian industrial companies?*

The paper is constructed as follows. The next section reviews the related literature. The following part then outlines the research methodology utilised in this study. The empirical results are then reported and analysed followed by the overall conclusion.

### **Performance evaluation practices**

Traditional financial measures have many criticisms: the changing nature of work; increasing competition; specific improvement initiatives; national and international quality awards; changing organizational roles; changing external demands; and, the power of information technology (Hyvönen, 2005; Neely, 1999; Chenhall & Langfield-Smith, 1998). To overcome the limitations of traditional financial measures, many researchers have suggested that for businesses to survive in a competitive market place a new set of operational performance measures should be used (Burgess et al, 2007). These measures should provide managers, supervisors and operators with on-time

information that is necessary for daily decision-making. These measures should be flexible, primarily non-financial and able to be changed as needed (Ghalayini & Noble, 1996; Kaplan & Norton, 1992). Therefore, the proponents of strategic performance measurement (hereafter SPM) advocate two general approaches for developing SPM systems. The simplest approach calls for companies to measure and use a diverse set of financial and non-financial performance measures (i.e. performance measurement diversity) (Ittner et al, 2003). This approach emphasises the importance of using a combination of financial and non-financial measures. This is because such a combination is argued to be more effective for performance measurement (White, 2008; Xiong et al, 2008; Brignall, 2007; Chenhall & Langfiels-Smith, 2007; Chow & Van der Stede, 2006; Van der Stede, Chow & Lin, 2006; Dunk, 2005; Lau & Sholihin, 2005; Hussain & Gunasekaran, 2002; Hoque, Mia & Alam, 2001; Fisher, 1998; Hertenstein & Plat, 1998; Atkinson et al, 1997; Kaplan & Norton, 1996a, 1996b, 1996c 1993, 1992; Abernethy & Lillis, 1995; Fisher, 1995; Govindarajan, 1988). Performance measurement diversity is a simple approach and refers specifically to the extent to which a company measures and uses information related to a broad set of financial and non-financial measures (Henri, 2006; Ittner et al, 2003). Thus, measurement diversity emphasizes the multiplicity and variety of performance measures that can be grouped into financial performance and non-financial performance to develop a more comprehensive PMS (Hall, 2008). However, previous research (Van der Stede et al, 2006; Moers, 2005) defined performance measurement diversity as the use of multiple performance measures, including the use of subjective performance measures. Thus, measurement diversity approach focuses mainly on using a broad set of non-financial performance measures. Consequently, more attention has been given to non-financial measures of performance.

Non-financial performance measures are defined as measures that provide performance information in non-monetary terms such as customer satisfaction and employee satisfaction (Verbeeten & Boons, 2009). In this context, Moers (2006) defines two types of non-financial measures. First, the internal non-financial performance measures which consist of non-financial measures that are directly related to the tasks performed such as productivity and efficiency. Second, the external non-financial performance measures which reflect performance in the market such as customer satisfaction and market share. Non-financial performance measures cover many aspects in organisations. These include for example: customers; employees; innovation; quality; community; and, environment. Non-financial measures are broad and varied (Lau & Sholihin, 2005).

Empirically, several studies have focussed on performance measurement practices in different types of organisations in different countries. To determine the scope of current non-financial practices in USA and Canada, Stivers et al (1998) grouped 21 non-financial performance measures in the following five categories: customer service, market performance, innovation, goal achievement and employee involvement. The results of the study indicated that customer service measures are perceived to be the most important measure, market performance and goal achievement were also perceived to be highly important categories, whereas, innovation and employee involvement categories were perceived to be less important. Chenhall and Langfield-Smith (1998) found that Australian manufacturing companies use a broad set of non-financial measures such as customer satisfaction, employee attitudes, team performance, qualitative measures and ongoing supplier evaluations. In his study, Hyvönen (2005) found that Finish manufacturing companies put greater emphasis on recently developed non-financial measures of performance than the Australian companies reported by Chenhall and Langfield-Smith (1998). Hyvönen (2005) justifies his findings in that the sample period of these two studies is different. It should be noted that the Australian

results were in 1998 and the development of these latest techniques has been quite recent. In addition, the organisations presented in Hyvönen's study are leading companies in their field in the world and use the most advanced techniques. Hyvönen (2005) also argued that joining the European Union in 1995 changed the accounting legislation in Finland. Gosselin (2005) developed a questionnaire including a list of 73 financial and non-financial performance measures to measure the extent of their usage among Canadian manufacturing companies. Study findings indicated that despite all the recommendations to put more emphasis on non-financial measures, management in Canadian manufacturing companies is still giving much more weight in the PMS to financial measures. Widener (2006) surveyed 107 USA firms and found that top managers of these companies place more emphasis on non-financial measures related to employees (employee satisfaction and employee skill development), operational (cycle or lead time and sales from new products or services) and productivity.

Findings of previous research conducted in the UK (Abdel-Maksoud, Dugdale & Luther, 2005; Bhimani, 1994; Drury, Braund, Osborne & Tayles, 1993) provided confirmation that UK manufacturing companies are now reporting using a broad set of non-financial performance measures such as customer measures, quality measures, efficiency and utilisation measures and employee measures. Gomes, Yasin and Lisboa (2007) findings indicated the significance of non-financial measures among Portuguese manufacturing companies especially those related to customer and quality. Verbeeten and Boons (2009) findings indicated that Dutch firms use non-financial measures of performance (i.e. employee measures, customer measures, process measures, quality measures) to a larger extent.

In respect to other countries, Ismail (2007) found that Egyptians private companies rely on both financial and non-financial measures of performance evaluation. The profit margin, as a financial measure, is the most commonly used performance measure.



Customer satisfaction is the most commonly used non-financial measure of performance evaluation. In China, Xiong et al (2008) conducted a survey of senior executive and senior financial officers of large or mid-size firms. The purpose of the study was to determine the current usage of nine performance measurement criteria among Chinese firms and to analyse the importance of these measures across twelve different uses. The results of the study show that most Chinese firms currently use both financial and non-financial measures in their PMS. In particular, the top three performance measurement criteria used are strategy related measures (66.5%), financial measures (63.8%) and objective and subjective measures (62.7%). The bottom three performance measurement criteria are customer oriented measures (49.8%), internal process measures (49.3%) and learning and innovation measures (30.8%). Jusoh, Ibrahim and Zainuddin (2008) found that non-financial measures are used among Malaysian manufacturing companies to a greater extent. For example, the use of customer measures such as on-time delivery, customer response time, number of customer complaints and surveys of customer satisfaction are high among Malaysian manufacturing companies. Furthermore, the study found that Malaysian manufacturing companies place a major weight on the use of internal business process measures but innovation measures do not seem to be widely used.

In the context of Jordan, few studies have investigated non-financial performance practices. The limitations of these studies are that they take the performance measures in aggregate form (Said, HassabElnaby & Wier, 2003). Zwelef and Nour (2005) found that Jordanian banks use both financial and non-financial measures to evaluate their performance. In particular, the study findings indicated that Jordanian banks use financial measures, customer measures, internal business process measures and learning and growth measures. Additionally, Hawamdah (2006) found that Jordanian listed industrial companies use both financial and non-financial performance measures.

Zuriekat (2007) surveyed Jordanian listed manufacturing companies and found that the operational and customer category is used to a larger extent. The results also indicated that innovation, employee, supplier and quality categories are used to a moderate extent but the environment category tends not to be used by Jordanian manufacturing companies. In respect to the Jordanian public sector, Ababneh (2008) found that the customs department pays more attention to the growth and learning dimension of balanced scorecard approach followed by internal process and then customer satisfaction.

This study, however, extends previous research concerning the usage and practices of performance measures by investigating the extent of the use of thirty financial and non-financial measures across six categories including financial, internal business process, innovation and learning, customer, community and environment.

### **Importance of performance measures usage**

Effective performance measurement allows a firm to implement sound strategy, guide employee behaviour, assess managerial effectiveness, and provide the basis for employee rewards (Malina & Selto, 2004). The selection of performance measures which are appropriate to a particular company ought to be made in the light of the company's strategic priorities which will have been formed to suit the competitive environment in which it operates and the nature of its business. In choosing an appropriate range of performance measures, it will be necessary to balance them, to make sure that one measure or set of measures of performance is not emphasised to the detriment of others. In this context, Maltz, Shenhar and Reilly (2003, p.199) argued that any prescription for performance measurements should be simple, dynamic, and flexible over time, foster improvement, and be linked to the company's strategy and objectives. Notably, Franco-Santos et al (2007) and Neely, Mills, Platts, Gregory & Richard (1994) argued that deriving performance measures from strategy does not always happen in

reality. Franco-Santos et al (2007, pp. 796-797) argued that there are many measurement systems within businesses that have only operational goals, which may or may not be linked to strategy.

However, Kim, Park and Yoon (1997) argued that a performance measurement should provide timely, accurate feedback on the efficiency and effectiveness of an activity operation in any environment. In this context, Malina and Selto (2004) argued that performance measurement should improve decision-making, reflect system causality, and facilitate communication, learning and creation of new knowledge. Similarly, Hwang, Lee, Liu and Ouyang (2009) argued that PMS play a critical role in evaluating the achievement of firm goals, compensating managers, and developing strategies. The essential function of a PMS is to assess how well the activities within a process, or the outputs of a process, achieve specified goals. This includes a comparison of actual results with a planned goal and an assessment of the extent of any deviation from the standard goal (Chen, 2008; Ahmad & Dhafr, 2002;).

Empirically, Stivers et al. (1998) examined the importance of 21 non-financial measures in setting company goals in USA and Canada. The study findings indicated that of the 253 responding firms, 235 (92.9%) rated customer satisfaction and delivery performance/customer service as highly important. Product/process quality was rated as highly important by 206 (81.4%) of the responding firms and service quality by 205 (81.0%) of the 253 firms. Thus, customer service measures are perceived to be the most important measures. Market performance and goal achievement also are perceived to be highly important categories. Market share in the market performance categories was rated highly important by 200 (79.1%) of the responding firms. Productivity in the goal achievement category was rated highly important by 211 (83.4%) of the 253 firms. Factors in the innovation and employee involvement categories were perceived to be less important in goal setting. For example employee turnover in the employee

involvement category was rated as highly important by only 122 (48.2%) of the 253 firms. However, in this paper an individual measure was identified as highly important if it received a rating of four or greater on the five-point scale of importance.

Xiong et al (2008) conducted a survey of senior executive and senior financial officers of large or mid-size firms. The purpose of the study is to determine the current extent of usage of nine performance measures among Chinese firms and to analyse the importance of these measures across twelve different uses. Findings of the study show that the top four performance measurement effects with a high important score are profit increase (59.5%), motivating employees (54.7%), cost reduction (51.6%) and helping employees understanding enterprise strategy (48.1%). In their study to investigate whether the strategic priorities of an organization are associated with the use and effectiveness of specific performance measures, Verbeeten and Boons (2009) included an additional question on the importance of the performance measures for several goals. Their findings indicated that the PMS is important or very important for: operational decisions (85%), strategic decisions (80%), evaluating economic performance (71%), evaluating managerial performance (70%), rewarding employees (68%) and communication of strategy (50%). In addition, Verbeeten and Boons (2009) investigated whether specific measures are used for specific purposes. Their results indicated that financial and non-financial measures are used more frequently for operational and strategic decisions. On the other hand, budget, return on total capital (ROTC), process and innovation measures are used to a larger extent for incentive purposes. Finally, non-financial measures of customer and innovation are more important for the communication of strategy. Veen-Dirks (2010) examined how the importance that is attributed to a variety of financial and non-financial performance measures depends on the following two purposes: periodic evaluation of performance and determination of rewards. The empirical evidence in this study is based on a survey among 84 industrial

companies located in the Netherlands. Multiple interviews were conducted with both production managers and management accountants. The study provides evidence of a higher importance attached to both financial and non-financial performance measures in the periodic evaluation than in the determination of rewards. The results of the studies above indicate that PMS is used for many purposes other than evaluating and rewarding managers (Verbeeten & Boons, 2009).

### **Methodology**

A questionnaire survey was used to determine the performance measurement practices among Jordanian companies and to identify the main purposes of using performance measures. Using the number of workers per establishment for the definition of medium and large enterprises<sup>1</sup>, this study focuses on medium and large industrial companies. Thus, the sample frame includes those industrial companies with 50 employees and above to ensure that the sample companies have a formal PMS (see Hutaibat, 2005; Perera et al, 1997; Van der Stede et al, 2006). The proposed sampling frame consisted of 372 industrial companies. The questionnaires were conducted using financial managers or those in a similar position such as the head of the accounting department, assistant financial manager or management accountant.

Each company was contacted by telephone before sending out the questionnaire to give them some idea of the study's objectives, to invite them to participate in the study and to check the accuracy of postal address details. Based on the results of the telephone calls, the questionnaires were then sent to respondents who agreed to participate in the study by post with a covering letter and a prepaid self-addressed return envelope. Only 27 companies refused to participate in the study. The main reasons cited for not participating were: management policy of non-participation and the lack of time. Another 6 companies were eliminated from the original sample because their phone

---

<sup>1</sup> The medium enterprises are those with 50-249 employees and the large enterprises are those with more than 250 employees (Ministry of Industry and Trade, 2008).

numbers were disconnected and they ceased service with the Jordanian Telecommunication Company. Thus, the questionnaire was sent out to 339 companies. The questionnaires were left with the respondent for about ten days to enable completion. Follow-up telephone calls were made. A total of 179 questionnaires were returned including 168 usable questionnaires with a response rate of 49.9%. Details about the number of employees, sales turnover and sector classification are presented in Table 1 (see list of tables at the end of the paper).

The questionnaire was pre-tested based on a pilot study with 15 academics and financial managers of industrial companies in Jordan. The first two sections of the questionnaire include some demographic questions about the organization itself and the respondent. The third section of the questionnaire covered the extent of usage of a diverse set of financial and non-financial measures of performance by Jordanian industrial companies. This section of the questionnaire investigated the extent (i.e. frequency) of usage of a broad set of financial and non-financial measures across six categories including thirty measures drawn from the literature (Jusoh et al, 2008; Lau & Moser, 2008; Iselin, Mia & Sands, 2008; Franco-Santos, 2007; Gomes et al., 2007; Leung, Lam & Cao, 2006; Henri, 2006; Widener, 2006; Ittner et al, 2003; Maltz et al, 2003; Sohn, You, Lee & Lee, 2003; Hoque et al, 2001; Hoque & James, 2000). The choice of these measures was dependent on the criteria of the King Abdullah II award for excellence in private sector (King Abdullah II Center for Excellence, 2009). Furthermore, the choice of these measures was revised as a result of a pilot study. The respondents in the pilot study were given the opportunity to omit and suggest these measures depending on their actual usage. Furthermore, to cover all the measures that an organisation uses, this section also included spaces for participants to list and rate other measures that they use but were not included in the questionnaire (Iselin et al., 2008; Widener, 2006). Consistent with previous research (e.g. Ismail, 2007; Kald & Nilsson, 2000), section

four includes ten potential uses for performance measures adapted from the previous literature (Verbeeten & Boons, 2009; Franco-Santos, 2007; Malina & Selto, 2004). Finally, the five-point Likert scale was used in formatting the questionnaire.

### **Insert Table 1 here**

## **Results and discussion**

### **Performance Measures Practices**

When all 30 performance measures were ranked in terms of their frequency and mean usage<sup>2</sup>, Table 2 (see list of tables at the end of the paper) shows that Jordanian industrial companies are using both financial and non-financial measures. This result is consistent with the findings of previous studies conducted among Jordanian industrial and manufacturing companies (Zuriekat, 2007; Hawamdah, 2006; Hutaibat, 2005) which indicated that Jordanian companies use multiple measures of performance (financial and non-financial). The result is also consistent with the finding of Zwelef and Nour (2005) which was conducted in the Jordanian bank sector. Further, the result is consistent with the findings of previous research (Jusoh et al, 2008; Gomes et al., 2007; Ismail, 2007; Gosselin, 2005). The results presented in the table show that four out of seven financial measures were ranked as “used to a great extent” or “used to a very great extent” by more than 70% of the respondent companies with means ranging from 3.98 to 4.19. These measures include cost per unit produced (79.7%) sales growth (76.2%) operating income (77.4%) and return on investment (70.2). These results are also consistent with that of Joshi (2001) who surveyed large and medium-sized Indian manufacturing and found a high rate usage for financial measures. In addition, ROE and budget variances were ranked as “used to a great extent” or “used to a very great extent” by more than 60% of the respondent companies with means of 3.79 and 3.76

---

<sup>2</sup> The measures are divided into three groups to help discussions: relatively high use (a mean equal or above 3.5), relatively moderate use (a mean equal or above 2.5) and relatively low use (a mean below 2.5) (Al-khatatneh, & Al-Sa'aydeh, 2009; Jänkälä, 2007; Stivers et al, 1998).

respectively. Consistent with the findings of Jusoh et al (2008), EVA is the only financial measure that seems to be used to a small moderate extent among Jordanian industrial companies as it ranked as “used to a great extent” or “used to a very great extent” by only 26.8% with a mean of 2.69. However, previous research has criticised EVA in that it is complex and difficult to use (for example. Jusoh et al, 2008; Ittner & Larcker, 1998;), costly (for example Lovata & Costigan, 2002) and not superior to traditional accounting measures (for example Jusoh et al, 2008; Yenyurt, 2003). These reasons may also justify the low usage of this measure among Jordanian industrial companies.

Contrary to the findings of Joshi (2001), the results show that Jordanian industrial companies put more emphasis currently on non-financial measures. This result is also consistent with that of previous research (for example Verbeeten & Boons, 2009; Jusoh et al, 2008; Gomes et al., 2007; Widener, 2006; Hyvönen, 2005; Abdel-Maksoud, Dugdale & Luther, 2005; Chenhall & Langfield-Smith, 1998; Bhimani, 1994; Drury et al, 1993). The use of customer measures is high among Jordanian industrial companies. Table 2 shows that customer response time, on-time delivery, customer retention and survey of customer satisfaction are ranked at the top of the list since they were ranked as “used to a great extent” or “used to a very great extent” by 81.5%, 79.7%, 79.2% and 76.8% respectively with means ranging from 4.06 to 4.10. This result is consistent with Jusoh et al (2008) who found that the use of customer measures such as on-time delivery, customer response time, number of customer complaints and survey of customer satisfaction was high among Malaysian manufacturing companies. Similar results were found in studies by Hoque et al (2001) and Stivers et al (1998).

Most of the innovation and learning measures are also common among Jordanian industrial companies especially those measures that focus on employees. Three of the four employee measures were ranked as “used to a great extent” or “used to a very great



extent” by more than 60% of the respondent companies with a mean ranging from 3.73 and 3.89. In particular, the findings indicated that 69.1% of the respondent companies use employee training measure, 61.3% use employee safety measure and 60.7% use employee skill development measure. On the other hand, employee authorisation measure tends to be used to a moderate extent with a mean of 3.01. The number of new product launches is also a common innovation measure among Jordanian industrial companies. It was ranked as “used to a great extent” or “used to a very great extent” by 55.3% of the respondent companies with a mean of 3.54. Time-to-market new products tends to be used to a moderate extent. It was ranked as “used to a great extent” or “used to a very great extent” by 46.4% of the respondent companies with a mean of 3.29. Consistent with the findings of previous research (Jusoh et al, 2008; Hoque et al, 2001; Hoque & James, 2000), the number of new patents was ranked as “used to a great extent” or “used to a very great extent” at the bottom of the list as nominated by 24.4% of the respondents.

The results showed that two of the internal business process measures are commonly used among Jordanian industrial companies. These measures were ranked as “used to a great extent” or “used to a very great extent” by more than 65% of the respondent companies. These measures include labour efficiency variance (70.3%) and defect rates (67.9%). Rate of material scrap loss and manufacturing lead time seems to be used to a moderate extent as they ranked as “used to a great extent” or “used to a very great extent” by 51.8% and 44.0% of the respondent companies respectively.

Jordanian industrial companies place greater emphasis on the use of environment measures. Environmental compliance measure seems to be significantly used by Jordanian industrial companies. This measure was ranked as “used to a great extent” or “used to a very great extent” by 78.5% of the respondent companies with a mean of

4.05. Reducing wastes and emissions and environmental certification were also ranked by 57.2% and 53.0% of the respondents respectively.

Finally, the results indicate that community measures are the lesser used measures among Jordanian industrial companies. Public image was ranked the first among the community measures being reported by 57.1% of respondents as “used to a great extent” or “used to a very great extent” with a mean of 3.54. Community involvement was used only to a moderate extent with 37.5% participants ranking it as “used to a great extent” or “used to a very great extent”. Support of charity projects, support of social activities and participation in training and education tend to be ranked at the bottom of the list and used to a small moderate extent as they were ranked as “used to a great extent” or “used to a very great extent” by only 27.3%, 26.2% and 23.2% respectively.

### **Insert Table 2 here**

To identify the perspectives of performance measures, factor analysis with varimax rotation was used. Three items (EVA, Labour efficiency variance and public image) were deleted from the analysis. EVA was deleted due to insignificant factor loading, while labour efficiency variance and public image were deleted due to cross loading (Jusoh et al, 2008; Lau & Sholihin, 2005). From factor analysis, seven component factors were extracted with eigenvalues exceeding 1, explaining a total of 69.32 per cent of the variance. All the Cronbach alpha values are above the 60.0% and ranged from 69.8% to 89.0% (Henri et al, 2006). This result indicated that all the measures were reliable. These results were expected, as all the measures used in the research were based on well- developed questionnaire with high reliability scores from previous studies (for example Jusoh et al, 2008; Maiga & Jacobs, 2003; Hoque & James, 2000). Consistent with the previous research in the field (for example Iselin et al, 2008; Lau & Sholihin, 2005; Maiga & Jacobs, 2003; Hoque et al, 2001; Hoque & James, 2000), the

first component factor was named financial, the second component factor was named community, the third component factor was named customer, the fourth component factor was named employee, the fifth component factor was named environment, the sixth component factor was named innovation and the seventh component factor was named internal business process.

After factor analysis, descriptive statistics on the seven perspectives are displayed in Table 3. The table shows that responding companies place a major weight on the use of customer measures with a mean of 4.08 followed by financial perspective (4.00), environment perspective (3.71), employee perspective (3.59), internal business process perspective (3.42), innovation perspective (3.07) and community perspective (2.92).

### **Insert Table 3 here**

To understand better the usage of financial and non-financial measures among Jordanian industrial companies, Table 4 shows that, in general, Jordanian companies put more emphasis on the use of financial measures with a mean of 4.00. The table also shows that Jordanian companies use non-financial measures to a considerable extent with a mean of 3.47. Finally, the table shows that Jordanian companies use a diverse set of financial and non-financial measures with a mean of (3.54). This result is consistent with the findings of previous research (Jusoh et al, 2008; Gomes et al, 2007; Ismail, 2007; Gosselin, 2005).

### **Insert Table 4 here**

#### **Aims of Performance Measures Usage**

It has been argued that it is important that researches clarify in their studies the different roles that the performance measures play in the firms they are investigating (Franco-Santos, 2007). Previous research has determined that there are many uses for performance measures. In this context, Moers (2006) measured the importance of

performance measures for evaluation purposes, monetary compensation and non-monetary rewards. Ittner et al (2003) examined a broad set of performance measures use, which include goal setting, capital investment decisions, problem identification, performance evaluation and external disclosure. Henri and Journeault (2008) examined the importance of measurement and use of environmental performance indicators (hereafter EPIs) within Canadian manufacturing firms. In particular, the study examines four uses for EPIs, namely to monitor compliance with environmental policies and regulation, to motivate continuous improvement, to provide data for internal decision-making and to provide data for external reporting.

As shown in Table 5 most of the listed purposes of Jordanian industrial companies were ranked as "to a great extent" or " to a very great extent" by more than 50% of the respondent companies with a mean ranging from 3.49 to 4.29. These aims were: comply with legal requirements (85.7%), evaluate organisational performance (88.7%), supervise managers' productivity (78.6%), evaluate managerial performance (75.0%), encourage improvement of business processes (69.6%), reward employees (61.3%), manage operations processes (60.7%) and provide better understanding of the cause-effect relationship (51.2%). Informed decision-making and communicate strategy were ranked at the bottom of the list by 50% or less of respondents.

Although Jordanian companies place more emphasis on the use of performance measures to evaluate organisational and managerial performance, they also use them for other reasons. This finding is consistent with the argument of Verbeeten and Boons (2009) in that the PMS is used for many purposes other than solely evaluating and rewarding managers. The findings indicate that about 85.7% of Jordanian industrial companies use performance measures mainly to comply with legal requirements. This result indicates that Jordanian industrial companies still operate under significant institutional and government controls (Hussain & Gunasekaran, 2002; Hussain &

Hoque, 2002). There is an opportunity as a result to investigate the effect of some institutional factors on the extent of use of performance measures in Jordan in future research.

The findings also indicate that Jordanian industrial companies put less emphasis on the role of performance measures in providing a better understanding of the cause-effect relationship, informing decision making and communicating strategy as these aims were ranked at the bottom of the list as shown in Table 5. This result indicates that Jordanian companies use a diversity of financial and non-financial performance measures as an improved PMS and not as a strategic PMS (Malmi, 2001). This is because these three aims were identified as important attributes of performance measures in previous research (Hwang et al, 2009; Franco-Santos et al, 2007; Malina & Selto, 2004; Kim et al, 1997). Thus, Jordanian companies should direct their attention to these three aims in future.

In summary, the study findings indicate that Jordanian industrial companies use performance measures primarily to evaluate managerial and organisational performance. They also use performance measures to a significant extent to comply with legal requirements. The results also indicate that Jordanian companies pay less attention to communicating strategic decisions and cause-effect relationship in using these measures.

**Insert Table 5 here**

### **Conclusion**

Our knowledge about how Jordanian companies use and design performance measurements is very limited. Thus, this study is a preliminary attempt to cover the following two related issues: the extent of performance measures usage and the purposes or aims of their usage. A questionnaire-based survey was used to investigate

these phenomena. The survey findings indicated that Jordanian industrial companies use multiple performance measures in terms of financial and non-financial in their performance measurement systems.

The study findings also indicated that Jordanian industrial companies use performance measurements primarily to evaluate managerial and organizational performance. They also use performance measurement largely to comply with legal requirements. The results also indicated that Jordanian companies pay less attention to the communication of strategic decisions and cause-effect relationship in using these measurements. Consequently, three outcomes can be drawn from these results:

Although Jordanian companies place more emphasis on the use of performance measures to evaluate organisational and managerial performance, they also use them for other reasons. This result supports the idea that the PMS is used for many purposes other than solely evaluating and rewarding managers (Verbeeten & Boons, 2009).

The results indicate that Jordanian industrial companies still operate under significant institutional and government controls since they put more emphasis on using such measures to comply with legal requirements (Hussain & Gunasekaran, 2002; Hussain & Hoque, 2002).

The findings indicate that Jordanian industrial companies put less emphasis on the role of performance measures in providing a better understanding of the cause-effect relationship, informing decision making and communicating strategy in comparison with other purposes. This indicates that some Jordanian companies use measurement diversity approach as an improved PMS and not as strategic PMS (Malmi, 2001).

## Tables

**Table 1 Profile of the responding firms**

	Frequency	%
<b><i>Industry classification</i></b>		
Textile, clothing and footwear	12	7.1
Electrical appliances	7	4.2
Plastic and rubber products	18	10.7
Food products	27	16.1
Typing, paper and packing	11	6.5
Furniture and wooden products	13	7.7
Oil and gas industry	1	0.6
Chemical/pharmaceutical industry	24	14.3
Mining and quarrying	4	2.4
Tobacco and cigarettes	3	1.8
Iron, steel and aluminium industry	20	11.9
Building materials and construction	16	9.5
Others include IT products, automotive products...	12	7.1
<i>Total</i>	<i>168</i>	
<b><i>Total number of employees</i></b>		
50-149	70	41.7
150-249	35	20.8
250-499	41	24.4
500-999	15	8.9
1000 or grater	7	4.2
<i>Total</i>	<i>168</i>	
<b><i>Annual sales (in million JOD)</i></b>		
Less than 1 million	23	13.7
1-less than10 millions	51	30.3
10 – less than 20 millions	23	13.7
20 – less than30 millions	24	14.3
30 – less than 40 millions	10	6.0
40 – less than 80 millions	18	10.7
80 - less than160 millions	9	5.3
160–lessthan320 millions	4	2.4
320 – less than 640 millions	1	0.6
Above 640 millions	2	1.2
Unspecified	3	1.8
<i>Total</i>	<i>168</i>	

**Table 2 Performance measures usage among Jordanian industrial companies**

<b>Code</b>	<b>Performance measures</b>	<b>% rating 1</b>	<b>% rating 2</b>	<b>% rating 3</b>	<b>% rating 4 or 5</b>	<b>Mean</b>	<b>S.D</b>
C5	Costs per unit produced	3.0	0.6	16.7	79.7	4.19	0.94
C2	sales growth	1.2	4.8	17.9	76.2	4.15	0.96
C1	Operating income	1.8	2.4	18.5	77.4	4.13	0.92
C19	Customer response time	1.2	1.8	15.5	81.5	4.10	0.81
C22	Customer retention	1.2	5.4	14.3	79.2	4.10	0.92
C21	Survey of customer satisfaction	0.6	4.2	18.5	76.8	4.07	0.87
C20	On-time delivery	1.2	6.5	12.5	79.7	4.06	0.92
C28	Environmental compliance	3.0	2.4	16.1	78.5	4.05	0.93
C3	Return on investment (ROI)	2.4	4.8	22.6	70.2	3.98	1.00
C15	Employee training	1.2	6.0	23.8	69.1	3.89	0.93
C4	Return on Equity (ROE)	2.4	8.3	27.4	61.9	3.79	1.04
C8	Defect rates	6.5	6.0	19.6	67.9	3.78	1.13
C6	Budget variances	3.6	7.1	25.0	64.3	3.76	1.03
C17	Employee Safety	1.8	5.4	31.5	61.3	3.73	0.91
C16	Employee skill development	1.2	6.5	31.5	60.7	3.73	0.91
C11	Labour efficiency variance	4.2	8.3	17.3	70.3	3.72	1.00
C30	Reducing wastes and emissions	9.5	7.7	25.6	57.2	3.57	1.23
C23	Public image	4.2	5.4	33.3	57.1	3.54	0.91
C13	Number of new product launches	8.3	5.4	31.0	55.3	3.54	1.13
C29	Environmental certification	8.3	8.3	30.4	53.0	3.53	1.19
C10	Rate of material scrap loss	8.9	13.1	26.2	51.8	3.36	1.15
C14	Time-to-market new products	10.7	10.1	32.7	46.4	3.29	1.15



**Continued Table 2 Performance measures usage among Jordanian industrial companies**

<b>Code</b>	<b>Performance measures</b>	<b>% rating 1</b>	<b>% rating 2</b>	<b>% rating 3</b>	<b>% rating 4 or 5</b>	<b>Mean</b>	<b>S.D</b>
C24	Community involvement	7.7	11.9	42.9	37.5	3.15	0.96
C9	Manufacturing lead time	14.9	13.1	28.0	44.0	3.12	1.22
C18	Employee authorization	6.5	22.6	37.5	33.4	3.01	0.97
C26	Support of social activities	8.3	26.8	38.7	26.2	2.88	1.01
C27	Support of charity projects	11.3	25.6	35.7	27.3	2.86	1.08
C25	Participation in training and education	9.5	26.8	40.5	23.2	2.81	0.98
C7	Economic value added (EVA)	17.3	23.8	32.1	26.8	2.69	1.06
C12	Number of new patents	36.3	17.3	22.0	24.4	2.38	1.27

**Table 3 Descriptive statistics for the usage of different performance perspectives**

<b>Performance perspectives</b>	<b>Mean</b>	<b>S.D</b>
Customer	4.08	0.73
Financial	4.00	0.79
Environment	3.71	0.93
Employee	3.59	0.74
Internal business process	3.42	0.94
Innovation	3.07	0.94
Community	2.92	0.84

**Table 4 Descriptive statistics for the usage of financial measures, non-financial measures and all measures**

<b>Performance measures type</b>	<b>Mean</b>	<b>S.D</b>
Financial measures	4.00	0.79
Non-financial measures	3.47	0.56
Performance measurement diversity usage	3.54	0.52

**Table 5 Specific aims of performance measurements**

<b>Code</b>	<b>Purpose of usage</b>	<b>% rating 1</b>	<b>% rating 2</b>	<b>% rating 3</b>	<b>% rating 4 or 5</b>	<b>Mean</b>	<b>S.D</b>
D9	Comply with legal requirements	0.0	2.4	11.9	85.7	4.29	0.77
D1	Evaluate organisational performance	0.0	1.8	9.5	88.7	4.27	0.71
D10	Supervise managers' productivity	0.6	3.0	17.9	78.6	4.04	0.80
D2	Evaluate managerial performance	1.2	2.4	21.4	75.0	4.01	0.85
D6	Encourage improvement of business processes	0.0	5.4	25.0	69.6	3.89	0.84
D3	Reward employees	1.2	5.4	32.1	61.3	3.80	0.94
D4	Manage operations processes	1.2	6.5	31.5	60.7	3.67	0.86
D7	Provide better understanding of the cause-effect relationship	1.2	16.7	31.0	51.2	3.49	1.00
D5	Inform decision making	0.6	15.5	33.9	50.0	3.46	0.93
D8	Communicate strategy	2.4	19.6	28.6	49.4	3.39	1.03

## References

- Ababneh, R. (2008). A comprehensive performance evaluation of the Jordanian customs department using the balanced scorecard. *Jordan Journal of Business Administration*, 4(4), 463-484.
- Abdel-Maksoud, A., Dugdale, D., & Luther, R. (2005). Non-financial performance measurement in manufacturing companies. *The British Accounting Review*, 37(3), 261-297.
- Abernethy, M. A., & Lillis, A. M. (1995). The impact of manufacturing flexibility on management control system design. *Accounting Organizations and Society*, 20(4), 241-258.
- Ahmad, M. M., & Dhafir, N. (2002). Establishing and improving manufacturing performance measures. *Robotics and Computer-Integrated Manufacturing*, 18(3-4), 171-176.
- Al-Akra, M., Ali, M. J., & Marashdeh, O. (2009). Development of accounting regulation in Jordan. *The International Journal of Accounting*, 44, 163-186.
- Al-khatatneh, W. R., & Al-Sa'aydeh, M. I. (2009). The level of awareness of Jordanian industrial public companies' managers of the significance of the non-financial perspectives (measures) of the balanced scorecard (BSC) in evaluating the performance of their companies. *Jordan Journal of Business Administration*, 5(1), 1-18.
- Atkinson, A., Balakrishnan, R., Booth, P., Cote, J., Groot, T., Malmi, T.,... Wu, A. (1997). New Directions in Management Accounting Research. *Journal of Management Accounting Research*, 9, 79-108.
- Bhimani, A. (1994). Monitoring performance measures in UK manufacturing companies. *Management Accounting*, 72 (1), 34-36.
- Bourne, M., Neely, A., Mills, J., & Platts, K. (2003). Implementing performance measurement systems: a literature review. *International Journal of Business Performance Management*, 5(1), 1-24.
- Braam, G. J. M., & Nijssen, E. J. (2004). Performance effects of using the Balanced Scorecard: a note on the Dutch experience. *Long Range Planning*, 37, 335-349.
- Brignall, S. (2007). A financial perspective on performance Management. *The Irish Accounting Review*, 14(1), 15-29.
- Burgess, T. F., Ong, T. S., & Shaw, N. E. (2007). Traditional or contemporary? The prevalence of performance measurement system types. *International Journal of Productivity and Performance Management*, 56(7), 583-602.
- Chen, C. C. (2008). An objective-oriented and product-line-based manufacturing performance measurement. *International Journal of Production Economics*, 112(1), 380-390.
- Chenhall, R. H., & Langfield-Smith, K. (1998). Adoption and benefits of management accounting practices: an Australian study. *Management Accounting Research*, 9, 1-19.
- Chenhall, R. H., & Langfield-Smith, K. (2007). Multiple Perspectives of Performance Measures. *European Management Journal*, 25(4), 266-282.
- Chow, C. W., & Van der Stede, W. A. (2006). The Use and usefulness of Nonfinancial Performance Measures. *Management Accounting Quarterly*, 7(3), 1-8.
- Drury, C., Braund, S., Osborne, P., & Tayles, M. (1993). A survey of management accounting practices in UK manufacturing companies. *The Chartered Association of Certified Accountants, Certified Research Report*, 32, 1-83.
- Dunk, A. S. (2005). Financial and non-financial performance: the influence of quality of information system information, corporate environmental integration, product innovation, and product quality. *Advances in Management Accounting*, 14, 91-114.
- Fisher, J. (1995). Contingency-based research on management control systems: Categorization by level of complexity. *Journal of Accounting Literature*, 14, 24 - 53.
- Fisher, J. (1998). Contingency Theory, Management Control Systems and Firm Outcomes: Past results and future directions. *Behavioural Research in Accounting*, 10, 47 - 64.

- Franco-Santos, M. (2007). *The Performance Impact of Using Measurement Diversity in Executives' Annual Incentive Systems*. Unpublished PhD thesis, Cranfield University, Cranfield, UK.
- Franco-Santos, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B.,... Neely, A. (2007). Towards a definition of a business performance measurement system. *International Journal of Operations & Production Management*, 27(8), 784-801.
- Ghalayini, A. M., & Noble, J. S. (1996). The changing basis of performance measurement. *International Journal of Operations & Production Management*, 16(8), 63-80.
- Gomes, C. F., Yasin, M. M., & Lisboa, J. V. (2007). An empirical investigation of manufacturing performance measures utilization: The perspectives of executives and financial analysts. *International Journal of Productivity and Performance Management*, 56(3), 187-204.
- Gosselin, M. (2005). An empirical study of performance measurement in manufacturing firms. *International Journal of Productivity and Performance Management*, 54(5/6), 419-437.
- Govindarajan, V. (1988). A contingency approach to strategy implementation at the business-unit level: Integrating administrative mechanisms with strategy. *Academy of Management Journal*, 31(4), 828-853.
- Hall, M. (2008). The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance. *Accounting, Organizations and Society*, 33, 141-163.
- Hawamdah, M. (2006). *Usage and utilization of the balanced scorecard. Empirical study on Jordanian Industrial Companies*. Unpublished Master Thesis, Yarmouk University, Jordan.
- Henri, J. F. (2006). Organizational culture and performance measurement systems. *Accounting, Organizations and Society*, 31, 77-103.
- Henri, J. F., & Journeault, M. (2008). Environmental performance indicators: An empirical study of Canadian manufacturing firms. *Journal of Environmental Management*, 87(1), 165-176.
- Hertenstein, J. H., & Plat, M., B. (1998). Why product development teams need management accountants. *Management Accounting*, 10, 50-55.
- Hoque, Z., Mia, L., & Alam, M. (2001). Market competition, computer-aided manufacturing and use of multiple performance measures: an empirical study. *The British Accounting Review*, 33(1), 23-45.
- Hoque, Z., & James, W. (2000). Linking balanced scorecard measures to size and market factors: Impact on Organizational Performance. *Journal of Management Accounting Research*, 12, 1-17.
- Hussain, M., & Gunasekaran, A. (2002). Non-financial management accounting measures in Finnish financial institutions. *European Business Review*, 14(3), 210-229.
- Hussain, M., & Hoque, Z. (2002). Understanding non-financial performance measurement practices in Japanese banks. A new institutional sociology perspective. *Accounting, Auditing & Accountability Journal*, 15(2), 162-183.
- Hutaibat, K. A. (2005). *Management Accounting practices in Jordan: a contingency approach*. Unpublished PhD Thesis, University of Bristol, Bristol, UK.
- Hwang, D. Y., Lee, A. C., Liu, C. -C., & Ouyang, L. (2009). Balanced Performance Index and Its Implications: Evidence from Taiwan's Commercial Banks. *Review of Pacific Basin Financial Markets and Policies*, 12(1), 27-62.
- Hyvönen, J. (2005). Adoption and benefits of management accounting systems: Evidence from Finland and Australia. *Advances in International Accounting*, 18, 97-120.
- Iselin, E. R., Mia, L., & Sands, J. (2008). The effects of the balanced scorecard on performance: The impact of the alignment of the strategic goals and performance reporting. *Journal of General Management*, 33(4), 71-85.
- Ismail, T. H. (2007). Performance evaluation measures in the private sector: Egyptian practice. *Managerial Auditing Journal*, 22(5), 503-513.

- Ittner, C. D., & Larcker, D. F. (1998). Innovations in performance measurement: Trends and research implications. *Journal of Management Accounting Research*, 10, 205-238.
- Ittner, C. D., Larcker, D. F., & Randallb, T. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations and Society*, 28, 715-741.
- Jänkälä, S. (2007). *Management control systems (MCS) in the small business context. Linking effects of contextual factors with MCS and financial performance of small firms*. Unpublished PhD Thesis, University of Oulu, Oulu, Finland.
- Jusoh, R., Ibrahim, D. N., & Zainuddin, Y. (2008). The performance consequence of multiple performance measures usage: evidence from the Malaysian manufacturers. *International Journal of Productivity and Performance Management*, 57(2), 119-136.
- Kald, M., & Nilsson, F. (2000). Performance measurement at Nordic companies. *European Management Journal*, 18(1), 113-127.
- Kaplan, R. S., & Norton, D. P. (1992). The balanced Scorecard-measures that drive performance. *Harvard Business Review*, 70(1), 71-79.
- Kaplan, R. S., & Norton, D. P. (1993). Putting the balanced scorecard to work. *Harvard Business Review*, 71(5), 134-147.
- Kaplan, R. S., & Norton, D. P. (1996a). *The balanced scorecard: Translating strategy into action*. Harvard Business School Press, Boston, MA.
- Kaplan, R. S., & Norton, D. P. (1996b). Using the balanced scorecard as a strategic management system. *Harvard Business Review*, 74(1), 75-85.
- Kaplan, R. S., & Norton, D. P. (1996c). Linking the balanced scorecard to strategy. *California Management Review*, 39(1), 53-79.
- Kim, G., Park, C. S., & Yoon, K. P. (1997). Identifying investment opportunities for advanced manufacturing systems with comparative-integrated performance measurement. *International Journal of Production Economics*, 50(1), 23-33.
- King Abdullah II Center for Excellence. (2009). *King Abdullah II Award for Excellence for the private sector, Jordan*. Retrieved May15, 2009, from <http://www.kaaps.jo/award-criteria-and-assessment-process>
- Lau, C. M., & Moser, A. (2008). Behavioral Effects of Nonfinancial Performance Measures: The Role of Procedural Fairness. *Behavioral Research in Accounting*, 20(2), 55-71.
- Lau, C. M., & Sholihin, M. (2005). Financial and nonfinancial performance measures: How do they affect job satisfaction?. *The British Accounting Review*, 37, 389-413.
- Leung, L., Lam, K., & Cao, D. (2006). Implementing the balanced scorecard using the analytic hierarchy process & the analytic network process. *Journal of the Operational Research Society*, 57, 682-691.
- Lovata, L., & Costigan, M. (2002). Empirical analysis of adopters of economic value added. *Management Accounting Research*, 13(2), 2 15-228.
- Maiga, A. S., & Jacobs, F. A. (2003). Balanced scorecard, activity-based costing and company performance: An empirical analysis. *Journal of Managerial Issues*, 15(3), 283-301.
- Malina, M. A., & Selto, F. H. (2004). Choice and change of measures in performance measurement models. *Management Accounting Research*, 15, 441-469.
- Malmi, T. (2001). Balanced scorecards in Finnish companies: A research note. *Management Accounting Research*, 12, 207-220.
- Maltz, A. C., Shenhar, A. J., & Reilly, R. R. (2003). Beyond the Balanced Scorecard: Refining the Search for Organizational Success Measures. *Long Range Planning*, 36, 187-204.
- Marshall, M., Wray, L., Epstein, P., & Grifel, S. (1999). 21st century community focus: better results by linking citizens, government and performance measurement. *Public Management*, 81(10), 12-19.
- Ministry of Industry and Trade. (2008). *Realities of Industrial Sector in Jordan*. Retrieved October19, 2009 from <http://www.mit.gov.jo/tabid/476/Realities%20of%20Industrial%20Sector%20in%20Jordan.aspx>

- Moers, F. (2005). Discretion and bias in performance evaluation: the impact of diversity and subjectivity. *Accounting, Organizations and Society*, 30, 67-80.
- Moers, F. (2006). Performance Measure Properties and Delegation. *The Accounting Review*, 81(4), 897-924.
- Neely, A. (1999). The performance measurement revolution: why now and what next?. *International Journal of Operations & Production Management*, 19(2), 205-228.
- Neely, A., Gregory, M., & Platts, K. (2005). Performance measurement system design: A literature review and research agenda. *International Journal of Operations & Production Management*, 25(12), 1228-1263.
- Neely, A., Mills, J., Platts, K., Gregory, M., & Richard, A. (1994). Realising strategy through measurement. *International Journal of Operations & Production Management*, 14(3), 140-52.
- 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*, 22(6), 557-572.
- Said, A. A., HassabElnaby, H. R., & Wier, B. (2003). An Empirical Investigation of the Performance Consequences of Nonfinancial Measures. *Journal of Management Accounting Research*, 15, 193-123.
- Sohn, M. H., You, T., Lee, S. L., & Lee, H. (2003). Corporate strategies, environmental forces, and performance measures: a weighting decision support system using the k-nearest neighbour technique. *Expert Systems with Applications*, 25, 279-292.
- Stivers, B. P., Covin, T. J., Hall, N. G., & Smalt, S. W. (1998). How nonfinancial performance measures are used. *Management Accounting*, 79(8), 44-49.
- Van der Stede, W. A., Chow, C. W., & Lin, T. W. (2006). Strategy, Choice of Performance Measures, and Performance. *Behavioural Research in Accounting*, 18, 185-206.
- Veen-Dirks, P. (2010). Different uses of performance measures: The evaluation versus reward of production managers. *Accounting, Organizations and Society*, 35, 141-164.
- Verbeeten, F. H. M., & Boons, A. N. A. M. (2009). Strategic priorities, performance measures and performance: an empirical analysis in Dutch firms. *European Management Journal*, 27, 113-128.
- Widener, S. (2006). Associations between strategic resource importance and performance measure use: The impact on firm performance. *Management Accounting Research*, 17, 433-457.
- White, L. F. (2008). The use of performance measures and their Outcomes. *Journal of American Academy of Business*, 13(1), 133-136.
- Xiong, Y., Su, W., & Lin, T. W. (2008). The use of financial and nonfinancial performance measures in Chinese firms. *Cost Management*, 22(5), 37-46.
- Yeniyurt, S. (2003). A literature review and integrative performance measurement framework for multinational companies. *Marketing Intelligence & Planning*, 21(3), 134-142.
- Zuriekat, M. (2007). Total Quality Management, Just in Time Production and Non-Financial performance measures: An Empirical Investigation. *The Scientific Journal of Faculty of Commerce, Assiut University Press*, 42, 1-25.
- Zwelef, E. M. H., & Nour, A. (2005). The Importance and Scope of Using Balanced Scorecard in Performance Evaluation: Applied study in Jordanian Banks. *Jordan Journal of Business Administration*, 1(2), 18-39