



The impact of contingency fit on organisational performance: an empirical study

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Structured Abstract:

Purpose – This research investigates the effectiveness of the performance measurement alignment approach which claims that measurement diversity (multiple performance measures) should be aligned with organisational contingencies to enhance organisational performance.

Design/methodology/approach – The theoretical framework is contingency theory. The study is an empirical investigation of the indirect relationship between three contextual factors (business strategy, information technology and organisation size) and organisational performance via multiple performance measures. The results are derived from cross-sectional questionnaire survey data from 132 Libyan companies (response rate of 61%). For data analysis, the research uses mediation regression analysis via Preacher and Hayes' (2004) macro.

Findings – There is a significant indirect effect of business strategy and information technology, but not organisation size, on organisational performance. The measurement diversity approach plays a core mediating role in the relationship between the contingencies and organisational performance.

Practical Implications – The study helps to provide a better understanding of the usefulness of the fit/match between contingencies and MPMs in improving organisational performance.

Originality/value – The empirical evidence supports the central proposition of contingency theory that there is no universally appropriate performance measurement system which applies equally to all organisations in all circumstances. It also provides evidence relating to non-manufacturing and an emerging market context. This research significantly extends the relevant literature by highlighting the relationship between information technology, multiple performance measures and organisational performance. This study is the first to use Preacher and Hayes' (2004) macro to analyse mediation design in the field of contingency-based performance measurement.

Keywords: *Performance measurement, Contingency approach, Business strategy, Information technology, Organisation size.*

1. Introduction

This study investigates the impact of contingency fit on the effectiveness of performance measurement systems (PMS) in improving organisational performance. The study applies a mediation-based interaction approach to contingency fit to assess the intervening role of multiple performance measures (MPM) in the relationship between several contingencies and organisational performance. More specifically, it examines the indirect impact of both the contingencies and organisational performance through MPM. Consequently, this study adds to the extant literature (e.g., Ittner et al., 2003; Said et al., 2003; Hoque, 2004; Van der Stede et al., 2006; Fleming et al., 2009; Jusoh, 2010; Wadongo and Abdel-Kader, 2014) by providing an empirical test for the assumption of contingency fit. The latter suggests that superior performance requires the alignment of multiple performance measures with other organisational characteristics. From a practice perspective, it remedies the paucity of such approaches in previous empirical studies (e.g., Ittner et al., 2003; Said et al., 2003; Hoque et al., 2004; Van der Stede et al., 2006; Jusoh et al., 2008; Fleming et al., 2009) concerning the performance measurement alignment approach.

The research conducts an empirical study on a sample of both manufacturing and non-manufacturing firms in Libya. Previous studies of this type have focused mainly on the manufacturing sector (Sohn et al., 2003). Given the growth of the service economy, this is an important deficiency of the extant literature. It will not be hypothesised that the inclusion of a large proportion of non – manufacturing firms in the research sample will have a particular effect on the relationships being examined since there is no prima facie reason to expect them to do so. Rather, their inclusion is important in terms of trying to identify whether there is a need for this issue to be investigated in depth in a future study. Likewise, this is one of the first empirical studies to address information technology as a contextual factor in terms of its impact on the effectiveness and implementation of PMS.

Most previous empirical studies on these issues have examined organisations in the West, most notably the USA (Jusoh and Parnell, 2008). Comparable studies in emerging market contexts are relatively rare (Haldma and Lääts, 2002; Jusoh, 2010). However, there is no indication from previous studies that geographical context makes a decisive impact on the relationships being studied. This may be due to the complexity of the inter relationships concerned and the possibility that any impact of the geographical context of a study is more likely to be found at the level of a particular contingency variable. Therefore, there are no hypotheses relating specifically to the geographical context of this study (Libya).

This study is the first to use Preacher and Hayes' (2004) macro to analyse mediation design in the field of contingency-based performance measurement. It is a powerful procedure because it relies on the products of three tests to make the final decision. The importance of this macro lies in its ability to distinguish between a mediation relationship and special indirect relationship designs. Most previous studies did not distinguish between a mediation relationship and special indirect relationship designs. Therefore, this research contributes to methodology by providing a new mediation method in the field of performance measurement and in the contingency literature.

The next section outlines the literature and the development of the research hypotheses. The research method applied is described in section 3. Section 4 outlines the study's findings which are discussed in section 5. Conclusions are drawn in the final section. This final section also captures limitations and future research directions.

2. Literature review and hypotheses development

This section develops research hypotheses from a review of the literature on the intervening role of multiple performance measures (MPM) in the relationship between organisational performance and contingencies (contextual factors), particularly business strategy, information technology and organisational size.

Performance measurement systems (PMS) represent a set of metrics used to quantify the efficiency and effectiveness of actions and are formed from several performance measures which are each grouped in specific categories. These metrics can be financial or non-financial, short or long term, operational or tactical or strategic, internal or external (Neely et al., 1995; Neely, 2005). Developments in performance measurement systems have resulted in differing views about how to design, implement and evaluate these systems effectively and efficiently (Elgazzar et al., 2019).

The measurement diversity approach asserts that improving organisational performance depends on the variety of the performance measures (regardless of the context or contingencies). This means that organisations achieve superior performance when they place a greater emphasis on a broad set of financial and non-financial performance measures (Ittner et al., 2003; Henri, 2006; Van der Stede et al., 2006; Balfaqih, et al., 2016; Elgazzar, et al., 2019). Omran et al. (2021) find that for firms that put an emphasis on a quality strategy, the disclosure of non-financial performance measures positively impacts operating financial performance.

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3 However, empirical studies have provided inconsistent evidence about whether such initiatives
4 yield significant economic benefits (Ittner et al., 2003; Braam and Nijssen, 2004; Schulz et al.,
5 2010).
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9 The measurement alignment approach suggests that improving organisational performance is
10 not dependent on variety. Instead, better performance can be achieved when PMS align with
11 the characteristics of an organisation and its environment. Therefore, the effectiveness of PMS
12 depends on the context-structure fit (Fisher, 1995; Langfield-Smith, 1997). This argument is
13 consistent with the assumption of contingency theory which deems that each organisation must
14 choose the most suitable system by considering the prevailing contingencies¹ (i.e., contextual
15 factors) (Chenhall, 2003). Therefore, contingency factors are important antecedents of the
16 design and implementation of PMS and PMS are, in turn, important influences on
17 organisational performance (Fisher, 1995; Chenhall and Langfield-Smith, 2003; Paranjape et
18 al., 2006; Speckbacher et al., 2003; Elgazzar, et al. 2019). In this context, it has been argued
19 that performance measurement systems (PMS) will be most effective when they match
20 symbiotically external environmental factors with internal organisational characteristics
21 (Bititci et al., 1997; Kattan et al., 2007). Tillema (2005) highlighted that: *“the appropriateness*
22 *of using sophisticated techniques may depend on the circumstances in which these techniques*
23 *are being used (and this) ...gives rise to the need to adopt a contingency theory perspective”*
24 (p. 102).
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35 The contradictory findings regarding the measurement diversity - organisational performance
36 relationship could be attributed, at least in part, to the omission of the potential effect of
37 contingency factors (Ittner and Larcker, 2001; Braam and Nijssen, 2004; Hogue, 2005).
38 Therefore, there is a need to investigate the influence of these contingencies on the
39 effectiveness of measurement diversity (Haldma and Lääts, 2002; Said et al., 2003; Braam and
40 Nijssen, 2004; Gerdin and Greve, 2004; Gosselin, 2005; Hyvönen, 2007; Wadongo and Abdel-
41 Kader, 2014). The performance management literature has concluded that the relationship
42 between contingency variables and the effectiveness of PMS is ambiguous (Ittner et al., 1997;
43 Hoque, 2004; Hyvönen, 2007). Therefore, although multiple performance measures (MPM)
44 (e.g., quality, productivity, innovation and customer satisfaction) have been investigated, most
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54 ¹ They are also called contingency/contextual factors which encompass some specific dimensions related to the external and
55 internal environment of the organisation (environmental and organisational characteristics), such as business strategy,
56 organisational size and environmental uncertainty.
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empirical studies have not found strong support for a relationship between contextual factors and measurement diversity or an influence of this relationship on organisational performance (Ittner et al., 2003; Hoque, 2004; Van der Stede et al., 2006; Hyvönen, 2007; Verbeeten and Boons, 2009).

2.1 Business strategy, MPMs and organisational performance

Many studies have found that performance measures are likely to be affected by business strategy (Chong and Chong, 1997; Ittner et al., 2003; Hoque, 2004; Braam and Nijssen, 2004; Gosselin, 2005; Van der Stede et al., 2006; Hyvönen, 2007; Fleming et al., 2009; Zhu et al., 2009; Verbeeten and Boons, 2009; Jusoh, 2010; Gimenez et al., 2012; Birhanu et al., 2018). It has been argued that to achieve competitive advantage and superior organisational performance, management control systems should be tailored to support business strategy (Simons, 1990; Hyvönen, 2007). Therefore, the strategy-structure-performance relationship has been a popular research topic over the past few decades. However, the impact of the fit or match between management practices (e.g., PMS) and contextual factors on organisational performance has not been addressed by many studies (Said et al., 2003). Indeed, the relationships between business strategy, performance measurement systems and performance need further investigation (Langfield-Smith, 1997; Verbeeten and Boons, 2009).

Several previous studies have found significant associations between competitive strategy and the use of performance measures and in turn organisational performance (Chong and Chong, 1997; Said et al., 2003; Sohn et al., 2003; Gosselin, 2005; Van der Stede et al., 2006; Abdel-Kader and Luther, 2008; Fleming et al., 2009; Zhu et al., 2009; Jusoh, 2010). However, in some cases there is no evidence of enhanced organisational performance derived from the alignment of multiple measurement systems with the chosen strategy (Ittner et al., 2003; Hyvönen, 2007; Verbeeten and Boons, 2009). Therefore, it seems that most previous studies tend to support the strategy-MPM relationship, but they find the impact of this interaction on performance to be inconclusive. Thus, there is a need for further investigation of how PMS can be designed and implemented with different strategies to achieve better performance. Nevertheless, based on these findings, the following hypothesis was developed:

H1 *There is an indirect effect of business strategy on organisational performance via the use of MPMs.*

2.2 Information technology, MPMs and organisational performance

Information technology (IT) is an important tool for measuring the effectiveness of organisational structures, control systems and strategy (Porter, 2001). Wadongo and Abdel-Kader (2014) have noted that IT is key to the implementation of performance measurement systems and contributes significantly to data collection and assessment, therefore this has an impact on the performance measures which form part of the measurement system. Performance measures *“that are without an integrated IT infrastructure would not be able to provide information that is relevant, accurate and up-to-date”* (Salleh et al., 2010, p. 997). Therefore, IT will play a key role in a PMS in terms of gathering, storing, processing and then disseminating performance-relevant information (Salleh et al., 2010). Indeed, PMS can be more responsive and dynamic using information technology supports of high quality (Hudson et al., 2001). For example, an adequate information technology infrastructure for supporting data collection and analysis and interpretation processes is required to implement and use PMS effectively and vice versa. Evidence suggests that the potential usefulness of advanced information technology increases in situations where organisations have adopted integrated PMS which include financial and non-financial measures (Hyvönen, 2007). Garengo and Bititci (2007) and Ismail (2007) argue that one of the major barriers to implementing MPM is the inadequacy of management information systems (MIS). Therefore, IT applications contribute to providing the information requirements of PMS which lead eventually to enhanced organisational performance.

Few studies have examined the influence of information technology on the effectiveness of control systems and most of them are of a theoretical nature. As a result, assessing information systems is a complex issue. Hyvönen (2007) found that a fit between contemporary performance measures and information technology does not enhance business performance. Al-Omiri and Drury (2007) found no clear association between the sophistication of cost systems and the quality of information technology. However, Salleh et al. (2010) found that the sophistication of information systems affected the type and extent of the use of performance measures among Malaysian financial organisations. In conclusion, it appears that the relationship between information technology and PMS is unclear.

Therefore, there is a need to understand the influence of IT on multiple performance measures which underpin the performance of the organisation (Garengo and Bititci, 2007; Marchand and Raymond, 2008; Salleh et al., 2010). Hariyati et al. (2019) have identified that innovation in

IT is important for organisations to gain a competitive advantage - so they can aim to have good financial and non-financial performance measures. Accordingly, this study considers advanced IT to be a contingency variable on the extent of the use of MPM and in turn on organisational performance. Consequently, the following hypothesis was developed:

H2 *There is an indirect effect of IT applications on organisational performance via the use of MPM.*

2.3 Organisation size, MPM and organisational performance

The contingency literature suggests that no unique design of PMS can serve appropriately all businesses; rather, companies ought to adapt their PMS in the light of changes to organisational contingencies (Neely and Bourne, 2000; Wadongo and Abdel-Kader 2014). From this perspective, organisation size is an important contingency variable which may decide the range of PMS within a company (Hussain and Hoque, 2002; Franco-Santos and Boume, 2005; Burgess et al., 2007; Wadongo and Abdel-Kader 2014). Organisation size may influence the way in which organisations design and use management information systems (Burns and Stalker, 1961; Gordon and Narayanan, 1984; Guenther and Heinicke, 2019). Differences in size might have an impact on the choice of control systems (Burgess et al., 2007; Wadongo and Abdel-Kader 2014). Many studies have concluded that the use of management accounting and performance measurement systems within small businesses is low (Chenhall and Morris, 1986; Pistoni and Zoni, 2000; Hoque and James, 2000; Hussain and Hoque, 2002; Chenhall, 2003; Burgess, et al. 2007; Verbeeten and Boons, 2009). This may be attributed to the fact that small organisations have limited financial resources compared to large organisations which cause them difficulties in updating their PMS. Larger organisations usually have greater resources, highly trained personnel, and better infrastructures to enable the adoption of innovative management control systems (e.g., MPM) (Burgess et al., 2007). As organisation size increases, performance measurement and control practices tend to become more specialized and sophisticated (Libby and Waterhouse, 1996).

Since cost of measurement has been found to be a concern for SMEs, small companies may be less likely to use MPM, although their deployment is not ruled out (Neely et al., 1994; Hoque and James, 2000; Al-Omiri and Drury, 2007; Larsson, et al. 2017). However, small businesses may adopt innovations, such as measurement diversity, more readily compared to large sized ones. Others have suggested that size may not have a significant impact on the use or effectiveness of PMSs (e.g., Mohamed and Hussain, 2010; Jusoh, 2010) and some studies have

found no evidence that organisation size has a significant effect on the use of MPM (Speckbacher et al., 2003; Hoque et al., 2001; Gosselin, 2005; Yongvanich and Guthrie, 2009). Therefore, the study of the impact of organisation size on the use of MPM and organisational performance is an issue which requires further investigation. The following hypothesis was developed:

H3 *There is an indirect effect of organisation size on organisational performance via the use of MPM.*

3. Research Method

The framework of the research focuses on the indirect relationship between the identified contingencies and organisational performance using multiple performance measures (MPM). A “contingency fit” approach was employed to interpret the results of this study. This approach is the fundamental proposition underpinning contingency theory (Drazin and Van de Ven, 1985). Wadongo and Abdel-Kader (2014) have noted that performance measurement mediates the relationship between contingency variables and organisational effectiveness. Thus, a mediation-based interaction approach to contingency fit was used to explain whether the change in organisational performance is attributed to the fit between the context (i.e., contingency factors) and structure (i.e., MPM). As illustrated in Figure 1, the research theoretical framework investigates the relationship between contingency factors, the use of MPM (as the independent mediating variable) and organisational performance (as the dependent variable). This framework suggests that the independent variable (antecedent variable) impacts the mediator variable which then impacts the outcome variable (consequent variable). This means that effective alignment between the use of performance measurement diversity and the identified organisational contingencies helps an organisation to achieve improved performance.

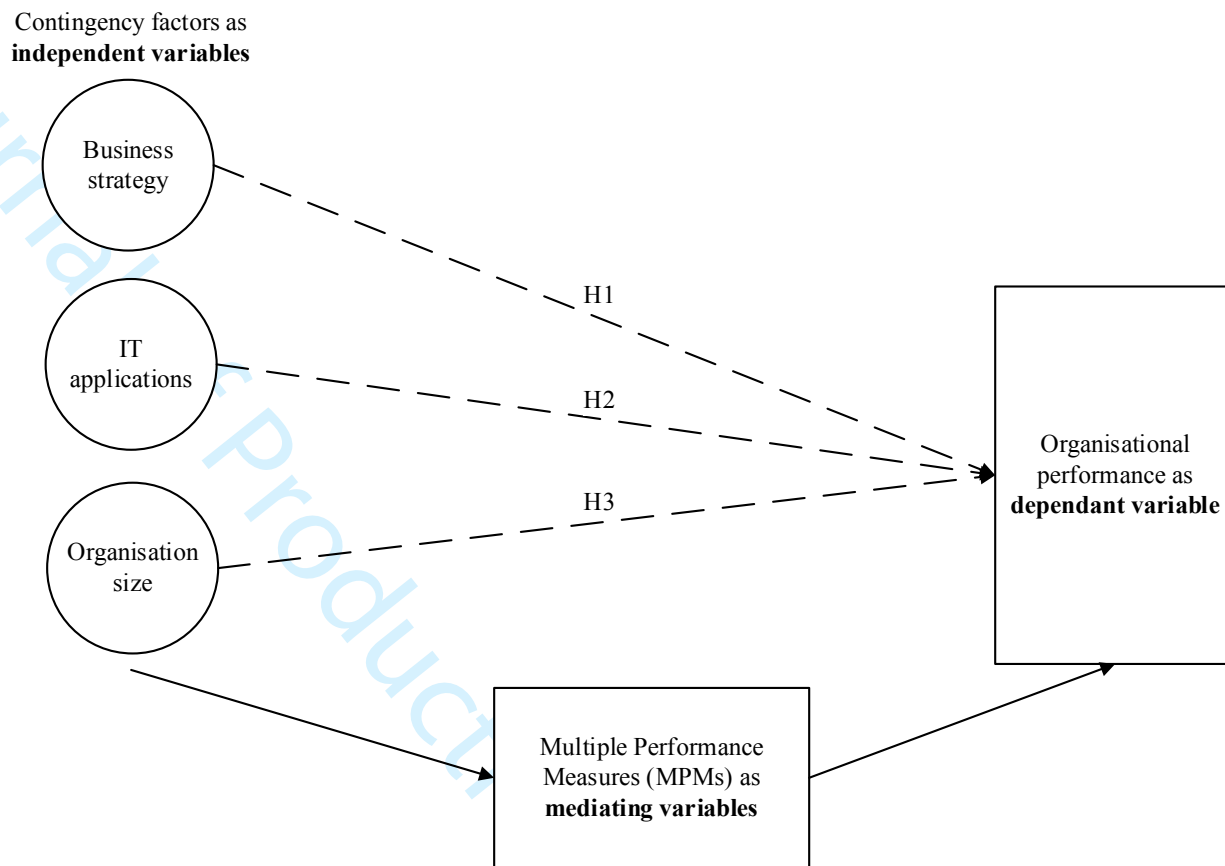


Figure 1: The research theoretical framework

Generally, in path analysis-based methods, fit is depicted as a statistically significant indirect effect (Gerdin and Greve, 2004). Fit exists when the impact of an explanatory variable (X) on an outcome variable (Y) operates through a third variable (mediator, M) (Gerdin and Greve, 2004; Cadez and Guilding, 2008). This study uses bivariate path analysis via Preacher and Hayes' (2004) macro which is suitable for small samples. The outcome matrix's macro comprises three main parts: namely, total, and direct effect, Sobel test and Bootstrapping test². Preacher and Hayes' (2004) macro is a powerful procedure because it relies on the products of the three tests to make the final decision and provides a simple interpretation of the results.

3.1 Sample and data collection

The sampling frame originally included all Libyan organisations in both manufacturing and non-manufacturing sectors. The sampling frame was modified by omitting organisations in certain categories. These included organisations of less than three years of age (because the

² For more details, see Preacher & Hayes (2004).

respondents were asked to describe selected research variables during the last three years) and very small organisations (less than 10 employees) because their use of performance measure systems is low. The final sampling frame included 226 Libyan organisations in a range of industries (76 manufacturing and 150 non-manufacturing). Only headquarters were included; subsidiaries, divisions and branches were excluded to obtain a more consistent sample.

Primary data for the research was collected using a self-administered questionnaire survey. 226 questionnaires were distributed, and 141 completed questionnaires were returned. 132 questionnaires were usable and valid for analysis (an approximately 61 % response rate). This rate is regarded as very good compared with other studies in the same field.

3.2 Questionnaire design

The questionnaire was divided into four main parts. All parts included closed questions, i.e., all the questions had a range of potential answers and the respondents had to select one. The first part consisted of questions concerning general information about the characteristics of participants and their organisations. The second, third and fourth parts were concerned with independent and dependent study variables (MPMs, contingency factors and organisational performance respectively). In these parts, the questions were presented using a five-point Likert scale. In addition, and consistent with the literature, the questionnaire survey targeted finance directors, vice-managers, financial controllers and senior accountants because they are likely to be responsible for designing and operating the performance measurement systems in their organisations and they have the greatest knowledge about the factors that could impact the effectiveness and design of PMS (Chenhall and Langfield-Smith, 1998; Verbeeten and Boons, 2009; Bellini et al., 2016; Sedera and Cokuge, 2020).

During the preparation of the measures and constructs for the research variables, any terms or measures which were specific to a particular sector were excluded to make the questionnaire generalizable to all sectors (manufacturing and non-manufacturing). To measure the research variables, respondents were given descriptions of them, and then asked about these descriptions over the previous three years. Furthermore, each factor was operationalised by using several items and each item was measured by using a five-point Likert-type scale. The conceptual definitions of these variables are provided in the next subsections.

The use of multiple performance measures (MPM) refers to the extent to which directors use a broad scope of information resulting from financial and non-financial measures for assessing

performance. This approach was spilt into five major categories, which are commonly used by both manufacturing and service organisations. The first four categories (measures of financial, internal operations, customers and innovation and learning perspectives) were adapted from the work of Hoque and James (2000), Hoque et al. (2001), Ittner et al. (2003), Bryant et al. (2004), Hoque (2004, 2005), Henri (2006), Van der Stede et al. (2006), Ismail (2007), Jusoh et al. (2008), Bento and White (2010), Salleh et al. (2010) and Jusoh (2010), which in turn are based on the study of Kaplan and Norton (1992). The fifth category (community/environment perspective) was modified from the work of Zuriekat (2005) and Youssef (2007). The instrument included 41 different measures based on all the above-mentioned categories. The respondents were requested to indicate on a five-point Likert-type scale ranging from 1 (not used at all) to 5 (considerably used), the extent of their organisation's use of the identified performance measures over the previous three years. The extent of the use of MPM usage is the overall mean of responses for all the 41 measures.

Business strategy (BS) refers to how an organisation creates value for customers and differentiates itself from competitors in the marketplace. It was measured relative to the two classic strategic postures ("prospectors" and "defenders") of the Miles and Snow (1978) typology. This factor was operationalised using an instrument which includes seven statements. These statements describe the type of strategic emphasis adopted by an organisation. This variable was defined as a continuum of two extremes: namely the "defender" and "prospector" typologies. This instrument was adapted from several previous studies (Govindarajan 1986; Abernethy and Guthrie, 1994; Chong and Chong, 1997; Said et al., 2003; Hoque, 2004; Cadez and Guilding, 2008). For each statement, respondents were asked to indicate their belief about their company's strategic priorities over the previous three years, using a five-point Likert-type scale ranging from 1 (totally disagree) to 5 (totally agree), equivalent to 1 (defender strategy) to 5 (prospector strategy).

Information technology (IT) refers to the extent and degree to which an organisation emphasises the use of diverse applications of advanced information technology (hardware, software, and different technological and informational applications). It was operationalised by 10 items which were derived from a mixture of relevant research (Anderson, 2001; Duh et al., 2006; Ismail and King, 2007; Mia and Winata, 2008; Sallah et al., 2010). Some statements were not used as they had been in the original instruments, but were re formatted. To measure this variable, respondents were asked to indicate the extent of the use of different IT

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3 applications by their organisation over the previous three years, using a five-point Likert-type
4 scale ranging from 1 to 5 (1= not at all, 5= to a considerable extent).
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7 Organisation size (OS) was measured by number of employees (NOE) working within a
8 company. This is consistent with earlier contingency-based PM studies (Hoque and James,
9 2000; Hussain and Hoque, 2002; Al-Omiri and Drury, 2007; Burgess et al., 2007; Abdel-Kader
10 and Luther, 2008; Mohammed and Hussain, 2010; Jusoh, 2010). However, because the
11 research sample included different industries (manufacturing and non-manufacturing), annual
12 revenue of company (AR) was employed as an additional proxy measure of organisation size
13 to avoid any variable bias. To measure these variables (NOE and AR), respondents were asked
14 to select one answer from several alternatives in the questionnaire.
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20 Organisational performance (OP) refers to the extent to which the organisation is successful in
21 achieving its planned targets or stated aims. It is described as the ultimate outcome variable
22 (dependent variable) in the contingency literature because it explains the implications of a
23 suitable fit between control systems design and other characteristics of an organisation. It was
24 assessed by a self-rating multiple scale. The scale includes 13 items originally developed by
25 Govindarajan (1984) and used subsequently by several studies (Chong and Chong, 1997;
26 Hoque, 2004, 2005; Van der Stede et al., 2006; Jusoh et al., 2008). Respondents were required
27 to rate each of the 13 dimensions on a five-point Likert-type scale ranging from 1 (poor) to 5
28 (outstanding), to assess their organisation's performance compared to that of their main
29 competitors over the previous three years. Organisational performance was defined as the
30 overall mean of responses for all items (Hoque, 2005; Jusoh et al., 2008).
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39 Several steps were taken to ensure the internal (content and construct) validity of the
40 measurement scale (questionnaire). Firstly, most questions and scales used in the research
41 questionnaire had been used in previous studies. Secondly, the questionnaire was pre-tested by
42 members of staff, doctoral students, and academic researchers in a university. Finally, a pilot
43 study was undertaken to ensure that respondents had no difficulty answering the questions.
44 There was no need to carry out any further tests, as these variables are based on a well-
45 developed instrument with high validity scores in previous studies. Since the research sample
46 represented the entire population, generalisability was achieved and did not require further
47 checks; therefore, external validity was met (Sekaran and Bougie, 2010).
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54 Cronbach's alpha was used to assess the overall reliability of the measurement scale. The
55 results indicate that the Cronbach alpha coefficients of all the variables were above the
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3 minimum acceptable level of 0.60 and ranged from 0.800 to 0.919³; therefore, all the measures
4 were reliable. These results were expected, as all the measures used in this study were based
5 on a data collection instruments with high reliability scores from previous studies (Hoque and
6 James, 2000; Jusoh et al., 2008).
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9 10 **4. Results**

11 *4.1 Non-response bias*

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14 Despite the satisfactory response rate of the study, it was necessary to check the possibility of
15 a non-response bias, as it might influence the generalisation of the research findings. Two
16 methods were used to assess the potential non-response bias: the first method was based on
17 comparing the primary data (main research variables) of early respondents (main/initial
18 respondents) with those of late respondents (i.e., respondents after the reminder call), and
19 comparing organisations' known characteristics (categorical variables) for early and late
20 respondents. This was considered a well-accepted method (Henri, 2006) and an independent
21 sample T-test was performed to test the significant differences in the mean scores of primary
22 data (concerning selected contextual factors, MPMs and organisational performance) provided
23 by early respondents versus late respondents. By contrast, a Chi-square test (χ^2) was used to
24 test the significant differences in the mean scores of data concerning business characteristics
25 to make sure there were no statistically significant differences between the earlier and later
26 responses.
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31 The results of the Chi-square and T-test indicate there were no statistically significant
32 differences between the "early" and "late" respondents regarding all identified characteristics
33 and variables data. The results, therefore, suggest that non-response bias does not exist and that
34 the findings of this survey can be generalised within the boundary of the research sample. By
35 contrast, the second method encompasses investigations of the reasons behind non-response.
36 In this, 14 non-respondents were contacted by phone to discuss the reason(s) for non-
37 participation in the research. They put forward several reasons: for example, lack of time,
38 company policy, receiving too many questionnaires recently. Others confirmed that they would
39 answer the questionnaire in the next few days; however, they did not do so. Consequently, it
40 can be seen hat the causes of non-response did not include any non-response bias issues.
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56 ³ Multiple performance measures usage (0.919), Business strategy (0.877), Information technology (0.862) and Organisational
57 performance (0.800).
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4.2 Business strategy (BS) and organisational performance (OP) through MPMs

Table 1 shows the outputs of the mediation regression analyses which were conducted to test hypothesis 1 via Preacher and Hayes' (2004) macro. The findings refer to the simple regression of OP on BS (path C) which yielded a highly significant total effect at the .05 confidence level ($\beta = .2240, p < .05$). The regression of MPM on BS (path, a) yielded a statistically significant direct effect at the .05 confidence level ($\beta = .3107, p < .05$). The regression of OP on MPM, after controlling for BS (path b), yielded a statistically significant direct effect at the .05 confidence level ($\beta = .4180, p < .05$), which supports the benefits of a measurement diversity approach regardless of the business strategy. Both the Sobel-test and the Bootstrapping-test were used to check the statistical significance of the indirect effect. The indirect effect (*ab*) of BS on OP through MPMs was significantly different from zero ($\beta = .1299, Z = 3.6139, p < .05$) by a 95% confidence interval based on 5000 bootstrap samples (.0581 to .2281 with a point estimate of .1315). Therefore, "fit" exists as the impact of BS on OP operating through MPM. By contrast, the findings of path *c'* indicated that the direct effect of BS on OP, while controlling for MPM, was not statistically significant at the 95% confidence interval ($\beta = .0941; p > .05$). Therefore, it can be stated that full mediation effect conditions were met. This implies that MPM, as a mediator in this model, play a full (completed) mediating role in the relationship between BS and OP. Therefore, research hypothesis **H1** was supported at the .05 significance level.

Table 1 about here

These results provide empirical support for the benefits of fit between context and structure on OP. The results regarding the BS-OP relationship, before and after controlling for MPM, confirm that the impact of the predictor (BS) on the dependent variable (OP) (illustrated as path C) is less after controlling for the mediator (MPM) (illustrated as path *c'*). It could be explained by the apparent change in the β -value in total effect design (BS-OP relationship) and in the direct effect design (BS-OP by controlling for MPM relationship), where the β -value of the BS-OP relationship is reduced when controlling for MPM. These comparisons indicate that the MPM as a mediator in this model (BS-OP) met the required preconditions for playing this full mediating role (i.e., the BS-OP relationship was mediated completely by MPM). This can occur for any hypothesis if it meets four required mediation conditions (as specified by Baron and Kenny, 1986) and an indirect effect is statistically significant. Overall, this implies that a

greater emphasis on the use of MPM is more effective when they align with the BS of an organisation.

The results of the macro support the existence of an indirect effect (fit) ($\beta = .1299$, $p < .05$) between BS, MPM and OP. The significant relationship between BS and MPM (path, a) suggest that Libyan companies which place more emphasis on a prospector-based strategic orientation may need to design and use MPM which can provide relevant information on their performance to support managers in decision-making in the best interests of their companies. Additionally, a significant indirect effect (*ab*) indicates that the extent of the use of performance measurement diversity appears to contribute to enhanced organisational performance in Libyan organisations which follow a prospector-based strategic orientation. In other words, the organisational performance of prospector strategy-focused Libyan companies tends to be much better once those companies adopt MPM to evaluate their performance. Therefore, these results confirm the importance of the mediating role of MPM in enhancing organisational performance within business strategies. This confirms the logic of the mediation-based context-structure fit, which is the central proposition of contingency theory.

4.3 Information technology (IT) and organisational performance (OP) through MPM

Table 2 shows the outputs of the mediation regression analyses conducted to test hypothesis 2 by Preacher and Hayes' (2004) macro. The findings indicate that the regression of OP on IT (path C) yielded a highly significant total effect ($\beta = .3648$, $p < .05$). The regression of MPM on IT (path, a) yielded a statistically significant direct effect ($\beta = .4097$, $p < .05$). The regression coefficient (β) presented in the path b indicated that the MPM-OP relationship, while controlling for IT, was still statistically significant ($\beta = .2907$, $p < .05$), which confirms the benefits of a measurement diversity approach regardless of IT. Both the Sobel-test and the Bootstrapping-test concluded that the indirect effect (*ab*) of IT on OP through MPM was statistically significant ($\beta = .1191$, $Z = 2.9527$, $p < .05$) by a 95% confidence interval based on 5000 bootstrap samples (.0515 to .1987 with a point estimate of .1187). This denotes that "fit" exists as the impact of BS on OP operating through MPM. By contrast, the findings of path *c'* indicated that the direct effect of IT on OP while controlling for MPM was also statistically significant ($\beta = .2457$; $p < .05$). The criterion of a partial mediation design was met, based on the results of path *c'*. This indicates that MPM partially mediate the relationship between IT and OP. Based on these results, the research hypothesis **H2** was supported at the .05 level of significance.

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3 *Table 2 about here*
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6 The results of the macro supported the existence of an indirect effect (*ab*) ($\beta = .1191, p < .05$)
7 between IT, MPM and OP. This indicates that the extent of the use of MPM contributes to the
8 enhanced organisational performance of those Libyan companies which place a greater
9 emphasis on the use of IT applications. This confirms the logic and importance of the context-
10 structure fit approach to contingency theory. Comparisons were made between the statistical
11 results regarding the IT-OP relationship before and after controlling for MPM (illustrated as
12 path C and path *c'* respectively), to introduce more explanations of feasibility and importance
13 of fit in this model. These results introduced empirical support for the benefits of fit between
14 MPM and IT on OP. The β -value in both paths confirms that the impact of IT on OP (illustrated
15 as path C) is less after controlling for the MPM (illustrated as path *c'*). It can be concluded,
16 therefore, that there was a significant partial mediation relationship between IT and
17 organisational performance using MPM (i.e., the IT-OP relationship was partially mediated by
18 MPM). This can accrue for any hypothesis if it meets four required mediation conditions
19 (Baron and Kenny, 1986) and if the indirect effect is statistically significant.
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22 In conclusion, strong empirical support is found for the proposition that IT is antecedent to the
23 choice of MPM which is, in turn, antecedent to organisational performance. Consequently, it
24 is found that MPMs have a key intervening role in the IT-OP relationship. In short, Libyan
25 organisations benefit from diverse information presented by MPM when they place a greater
26 emphasis on using communication networks (intranet and internet), different technological
27 applications and different informational applications related to control and accounting and this
28 contributes to improved performance by these organisations.
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31 *4.4 Organisation size (OS) and organisational performance (OP) through MPM*

32 Table 3 shows the outputs of the mediation regression analyses conducted to test hypothesis 3
33 by Preacher and Hayes' (2004) macro. It can be seen in this table that the statistical findings
34 regarding OS, in terms of NOE and AR, are similar. They indicate that the regression of OP on
35 NOE/AR (path C) yielded an insignificant total effect ($\beta = .0475, p > .05; \beta = .0602, p > .05$
36 respectively). By contrast, regressing MPM on NOE/AR (path, a) ($\beta = .0639, p < .05; \beta =$
37 $.0724, p < .05$ respectively) and regressing OP on MPM while controlling for NOE/AR (path,
38 b) ($\beta = .4684, p < .05; \beta = .4636, p < .05$ respectively) yielded a statistically significant direct
39 effect. Both the Sobel-test and the Bootstrapping-test concluded that the indirect effect (*ab*) of
40 OS on OP through MPM was statistically insignificant. By contrast, the results indicate that
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there is no mediation because the path (C) was not significant; however, this case is known as a special indirect relationship design⁴. Accordingly, it could be stated that there is no mediating effect of MPM on the OS-OP relationship. This is unsurprising since MPM, as a mediator in this model (OS-OP), do not meet the four required preconditions (as specified by Baron and Kenny, 1986) for playing a mediating role. Finally, it can be concluded that there is no mediation relationship between OS and OP using MPM. Therefore, hypothesis **H3** was not supported at the .05 level of significance.

In summary, the mediation regression results failed to support the existence of an indirect effect (fit) between OS (NOE and AR), MPM and OP ($\beta = .0299$, $p > .05$ and $\beta .0336$, $p > .05$ respectively). They also confirm that the impact of the predictor (OS) on the dependent variable (OP) (illustrated as path C) became bigger after controlling for the mediator (MPM) (illustrated as path c'). Finally, it is concluded that there is no significant mediation relationship between OS and OP using MPM; instead, there is a special indirect relationship design. These findings are contrary to the logic and importance of fit between context and structure, which is the central proposition of contingency theory. In conclusion, the findings indicate that there is no support for an indirect association between OS and OP through MPM. This suggests that MPM do not have a key intervening role in the relationship between OS and OP in the Libyan business environment.

Table 3 about here

5. Discussion

These mediation results are in line with studies which have found that BS is an important antecedent of MPM and that MPM are important antecedents of organisational performance (Chong and Chong, 1997; Hoque, 2004; Fleming et al., 2009). The results are in line with those of prior studies on the moderation design of the interaction approach to contingency fit which found a positive effect on performance from pairing the use of BS and MPM. (Said et al., 2003; Braam and Nijssen, 2004). By contrast, the findings are inconsistent with those of several other studies which concluded that there was no strong support for the view that aligning BS to MPM

⁴ See Preacher and Hayes (2004), Mathieu and Taylor (2006), Hayes (2009) and Mackinnon and Luecken (2011) for more details about a special indirect relationship design.

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3 helps organisations to achieve better performance (Ittner et al., 2003; Van der Stede et al., 2006;
4 Hyvönen, 2007; and Verbeeten and Boons, 2009).

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7 As was noted earlier, the number of empirical studies concerned with an indirect relationship
8 between IT and OP, via MPM, and based on contingency theory, is very limited. Thus, little
9 empirical evidence could be found with which to compare the results. Hyvönen (2007)
10 investigated the impact of the fit between IT and performance measures on business
11 performance based on a moderation approach to contingency fit, using data from 51 business
12 units of large organisations in Finland. It was found that the fit between contemporary
13 performance measures and IT does not help to enhance organisational performance. Abugalia
14 (2011) investigated the indirect impact of production technology (not information technology)
15 on business performance via management accounting practices (in terms of performance
16 measures, budgeting practices and cost practices) in Libya. The impact of production
17 technology on organisational performance via budgeting practices, performance measures and
18 management accounting practices, was found to be significant.
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27 These mediation results are not consistent with those of Zuriekat (2005) who found empirical
28 evidence for the proposition that OS is an important antecedent of MPMs and that MPMs are
29 important antecedents of organisational performance. However, the results are in line with the
30 findings of Hoque and James (2000) and Abugalia (2011) who found no evidence for the
31 hypothesis that MPMs are linked with superior business performance in larger companies.
32 Furthermore, based on the moderation design of the interaction approach to fit, Hoque and
33 James (2000) found that greater use of business scorecards is associated with improved
34 performance; but that this relationship does not depend significantly on organisation size.
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42 **6. Conclusions**

43 *6.1 Implications for contingency theory*

44 The purpose of this study was to investigate the indirect relationship between identified
45 contingency factors and organisational performance through multiple performance measures
46 (i.e., to investigate the effectiveness of the performance measurement alignment approach).
47 The data analysis finds support for the indirect effect of two identified contingency factors on
48 organisational performance through MPM. Overall, the results indicate that MPM play a
49 significant mediating / intervening role in the contingency relationship between organisational
50 performance and both business strategy and information technology; however, no mediation
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relationship regarding organisation size was found. The effectiveness of the use of MPMs is greater in the Libyan organisations which follow a prospector strategy and adopt a broad range of IT applications than those which do not. By contrast, organisation size did not make a useful contribution to the effectiveness of the use of MPM. Consequently, the findings are in line with the logic and importance of the context-structure fit, which is regarded as the central assumption of contingency theory. They confirm that contingency factors are important antecedents in the use of MPM and that diversity of MPM is an important antecedent of organisational performance. In short, the results provide empirical evidence to support the central proposition of contingency theory - that there is no universally appropriate PMS which applies equally to all organisations in all circumstances.

Very few studies have used the interaction approach to contingency fit to examine how organisational performance is influenced, via MPM, by contingency factors such as business strategy, information technology and organisation size. Therefore, one of the key contributions of this study is to identify how these variables and MPM interact, to impact organisational performance. This study also contributes to the contingency-based PM literature by focusing on information technology as an important influence on the effectiveness of MPM. Therefore, it contributes to the PM literature by employing information technology as a contextual factor to help understand the association between MPM and OP.

This study is the first to use Preacher and Hayes' (2004) macro to analyse mediation design in the field of contingency-based performance measurement. It is a powerful procedure because it relies on the products of three tests to make the final decision. The importance of this macro lies in its ability to distinguish between a mediation relationship and special indirect relationship designs. Most previous studies did not distinguish between a mediation relationship and special indirect relationship designs. Therefore, this research contributes to methodology by providing a new mediation method in the field of performance measurement and in the contingency literature.

6.2 Implications for practice

This study helps to provide a better understanding of the usefulness of the fit/match between contingencies and MPMs in improving organisational performance. Additionally, since the results of this empirical investigation were based on data from non-manufacturing, as well as manufacturing, sectors, the findings provide a valuable addition to the performance measurement literature. From a practice perspective, it remedies the scarcity of such

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3 approaches in previous empirical studies (e.g. Ittner et al., 2003; Said et al., 2003; Hoque et al.,
4 2004; Van der Stede et al., 2006; Jusoh et al., 2008; Fleming et al., 2009) concerning the
5 performance measurement alignment approach.
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9 Most previous empirical studies on these issues have examined organisations in the West, most
10 notably the USA (Jusoh and Parnell, 2008). Comparable studies in emerging market contexts
11 are relatively rare (Haldma and Lääts, 2002; Jusoh, 2010). The geographical context is of
12 importance in that the types of relationship which have been identified in a developed economy
13 context have been found to apply in this emerging market.
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18 *6.3 Limitations and future research directions*

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20 The results of this research are subject to limitations which provide signposts for future
21 research. Firstly, the evaluation of organisational performance by a self-rating scale is subject
22 to criticism in terms of its validity and reliability (Abernethy and Guthrie, 1994). However,
23 many studies have used this approach (e.g., Govindarajan, 1984; Chong and Chong, 1997;
24 Hoque, 2004, 2005; Jusoh et al., 2008) and so it has the merit of comparability. The search for
25 adequate ways and methods (e.g., archival data, records) to tackle these issues could be an
26 interesting avenue for further research.
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31 Secondly, the research hypotheses were based on an interaction approach to contingency fit;
32 therefore, the results were explained through this contingency framework. This means that the
33 research sought to present empirical evidence of the individual effect of the selected
34 contingencies on the extent of the use of MPM and organisational performance; by contrast the
35 combined effect (holistic view) was beyond the scope of this study. Therefore, there is an
36 opportunity for future research to consider a systems approach to contingency fit which can
37 provide a holistic view of the research problem. On the other hand, further research could focus
38 on the effect of other internal and external contextual factors on MPMs (e.g., culture,
39 organisational structure, uncertainty, and competition).
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46 Thirdly, the study adopted a cross-sectional design (i.e., it was conducted at one point in time
47 and did not show the use of performance measures over time) to investigate the cause-and-
48 effect relationships between identified research variables via regression analyses. Future
49 research could evaluate these causal relationships through longitudinal field research methods
50 to identify whether interaction among the contingencies, MPMs and performance are consistent
51 over time.
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Table 1: The indirect relationship between business strategy and organisational performance through MPMs

Causal steps approach		B	S. E	t	Sig.
Path C (total effect)	(BS -- OP)	.2240	.0596	3.7601	.0003
Path a (direct effect)	(BS -- MPMs)	.3107	.0556	5.5840	.0000
Path b (direct effect)	(MPMs -- OP.BS)	.4180	.0868	4.8159	.0000
Path c' (direct effect)	(BS -- OP. MPMs)	.0941	.0613	1.5355	.1271
Sobel test		Value	S.E.	Z	Sig
Indirect effect (ab)		.1299	.0359	3.6139	.0003
Bootstrapping		Mean	S.E.	LL 95 CI	UL 95 CI
Indirect effect (ab)		.1315	.0439	.0581	.2281
* Dependent variable (Y) = Organisational performance					
* Independent variable (X) = Business strategy (BS)					
* Mediator variable (M) = MPMs					

Table 2: The indirect relationship between information technology and organisational performance through MPMs

Causal steps approach		B	S. E	t	Sig.
Path C (total effect)	(IT -- OP)	.3648	.0570	6.4029	.0000
Path a (direct effect)	(IT -- MPMs)	.4097	.0536	7.6456	.0000
Path b (direct effect)	(MPMs -- OP.IT)	.2907	.0900	3.2283	.0016
Path c' (direct effect)	(IT -- OP. MPMs)	.2457	.0662	3.7093	.0003
Sobel test		Value	S.E.	Z	Sig
Indirect effect (ab)		.1191	.0403	2.9527	.0031
Bootstrapping		Mean	S.E.	LL 95 CI	UL 95 CI
Indirect effect (ab)		.1187	.0380	.0515	.1987
* Dependent variable (Y) = Organisational performance					
* Independent variable (X) = Information technology (IT)					
* Mediator variable (M) = MPMs					

Table 3: The indirect relationship between organisation size and performance through MPMs

Organisation size in terms of NOE					
Causal steps approach		B	S. E	t	Sig.
Path C (total effect)	(NOE -- OP)	.0475	.0324	1.466	.1449
Path a (direct effect)	(NOE -- MPMs)	.0639	.0317	2.016	.0459
Path b (direct effect)	(MPMs -- OP.NOE)	.4684	.0798	5.871	.0000
Path c' (direct effect)	(NOE -- OP. MPMs)	.0175	.0293	.5975	.5512
Sobel test		Value	S.E.	Z	Sig
Indirect effect (ab)		.0299	.0159	1.882	.0598
Bootstrapping		Mean	S.E.	LL 95 CI	UL 95 CI
Indirect effect (ab)		.0296	.0148	.0015	.0609
Company size in terms of AR					
Causal steps approach		B	S. E	t	Sig.
Path C (total effect)	(AS -- OP)	.0602	.0337	1.784	.0767
Path a (direct effect)	(AS -- MPMs)	.0724	.0331	2.187	.0306
Path b (direct effect)	(MPMs -- OP.AS)	.4636	.0799	5.805	.0000
Path c' (direct effect)	(AS -- OP. MPMs)	.0266	.0307	.8669	.3876
Sobel test		Value	S.E.	Z	Sig
Indirect effect (ab)		.0336	.0166	2.020	.0534
Bootstrapping		Mean	S.E.	LL 95 CI	UL 95 CI
Indirect effect (ab)		.0336	.0163	.0041	.0679
* Dependent variable (Y) = Organisational performance					
* Independent variable (X) = Company size (NOEandAS)					
* Mediator variable (M) = MPMs					

Research Questionnaire

This questionnaire includes a number of questions that basically attempt to capture your personal perceptions about the multiple performance measures within your company and the contextual variables that might influence the effectiveness and usage of these techniques. We are particularly interested in your own personal beliefs, opinions and experiences, so please do your best to answer all questions. There are useful instructions to guide you in answering the questions at the beginning of each section.

Part 1- This relates to profiles of the respondents and participating companies in the research

A1- This section seeks to present a profile of the respondents. Please tick the appropriate answer for each question.

A1.1- Position at work

- | | |
|--|--|
| <input type="checkbox"/> 1) Financial manager | <input type="checkbox"/> 2) Assistant/Vice-F.M |
| <input type="checkbox"/> 3) Controller (Auditor) | <input type="checkbox"/> 4) Head of accounting dept. |
| <input type="checkbox"/> 5) Other (please specify) | |

A1.2 - Education level

- | | |
|---|--|
| <input type="checkbox"/> 1) Secondary | <input type="checkbox"/> 2) Diploma |
| <input type="checkbox"/> 3) Bachelor's degree | <input type="checkbox"/> 4) Post-graduate (e.g. MSc, Ph.D) |
| <input type="checkbox"/> 5) Other (e.g. Professional qualifications)..... | |

A1.3 - Subject

- | | |
|---|---|
| <input type="checkbox"/> 1) Accounting | <input type="checkbox"/> 2) Business management |
| <input type="checkbox"/> 3) Finance | <input type="checkbox"/> 4) Economy |
| <input type="checkbox"/> 5) Other (please specify)..... | |

A1.4 - Experience		Less than 5	5 - Less than 10	10 - Less than 15	15 - Less than 20	20 years or more
		(1)	(2)	(3)	(4)	(5)
a	In the current job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b	With current company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c	Full working experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A2- The following questions describe the profile and characteristics of your company. For each question; please tick the appropriate box.

A2.1 - Company age

- | | |
|---|---|
| <input type="checkbox"/> 1) Less than 5 years | <input type="checkbox"/> 2) 5 - Less than 10 years |
| <input type="checkbox"/> 3) 10 - Less than 15 years | <input type="checkbox"/> 4) 15 - Less than 20 years |
| <input type="checkbox"/> 5) 20 years or more | |

A2.2 - Type of business

- 1) Manufacturing (.....) 2) Service (.....)
 3) Banking & Financial 4) Other (please specify).....

A2.3 - Number of employees (full-time) in your company

- 1) Less than 100 people 2) 100 - Less than 250 people
 3) 250 - Less than 500 people 4) 500 - Less than 1000 people
 5) 1000 people or more

A2.4 - The annual revenue/sales (in Libyan Dinar)

- 1) Less than 1 million 2) 1 - Less than 5 million
 3) 5 - Less than 10 million 4) 10 - Less than 15 million
 5) 15 million or more

A2.5- Type of company ownership

- 1) State-owned company
 2) Private company
 3) Joint-venture (shared between the State and a foreign partner)
 4) Joint-venture (shared between the State and private sector)
 5) Joint-venture (shared between the private sector and a foreign partner)

Part 2- This relates to multiple performance measures used in your company during the last 3 years

B- This section aims to describe the state and nature of multiple performance measures usage (diverse set of financial and non-financial measures and processes that managers use in order to assess success and performance of the company). There are a total of 41 items comprising both financial and non-financial performance measures.

B1- Please indicate the extent to which your company uses the performance measures listed below for assessing organisational performance and success by circling one number on the scale below for your answer.

	Not used at all 1	Slightly used 2	Moderately used 3	Significantly used 4	Considerably used 5
B1.1	Financial perspective-based performance measures				
1	Net income				1 2 3 4 5
2	Revenue/sales growth				1 2 3 4 5
3	ROI (Return on investment)				1 2 3 4 5
4	ROA (Return on asset)				1 2 3 4 5
5	ROE (Return on equity)				1 2 3 4 5
6	ROS (Return on sales)				1 2 3 4 5
7	Budgets				1 2 3 4 5
8	Cash flows				1 2 3 4 5
9	EPS (Earning per share)				1 2 3 4 5
10	EVA (Economic value added)				1 2 3 4 5
11	MVA (Market value added)				1 2 3 4 5
B1.2	Internal operations perspective-based performance measures				

1	1	Safety	1	2	3	4	5
2	2	Cycle time/lead times (product/service)	1	2	3	4	5
3	3	Product/service development	1	2	3	4	5
4	4	Defects rate (product/service)	1	2	3	4	5
5	5	Product/service quality	1	2	3	4	5
6	6	Cost savings	1	2	3	4	5
7	7	Productivity	1	2	3	4	5
11	B1.3 Customer perspective-based performance measures						
12	1	Market share	1	2	3	4	5
13	2	Customer satisfaction	1	2	3	4	5
14	3	Customer service	1	2	3	4	5
15	4	Number of customer compliances	1	2	3	4	5
16	5	Customer retention	1	2	3	4	5
17	6	Customer loyalty	1	2	3	4	5
18	7	Customer response time	1	2	3	4	5
19	8	On-time delivery (product/service)					
21	B1.4 Innovation and learning perspective-based performance measures						
22	1	Employee satisfaction	1	2	3	4	5
23	2	Employee loyalty	1	2	3	4	5
24	3	Skills development	1	2	3	4	5
25	4	Competitive position	1	2	3	4	5
26	5	Research and development activities	1	2	3	4	5
27	6	Employee training	1	2	3	4	5
28	7	Adapting to changes	1	2	3	4	5
29	8	New products/service innovation	1	2	3	4	5
31	B1.5 Environmental & community perspective-based performance measures						
32	1	Meeting of environmental commitments / environmental friendly	1	2	3	4	5
33	2	Support of charity projects	1	2	3	4	5
34	3	Support of social activities	1	2	3	4	5
35	4	Community regulations	1	2	3	4	5
36	5	Government citations/certification	1	2	3	4	5
37	6	Participation in training and education (Community involvement)	1	2	3	4	5
38	7	Public image	1	2	3	4	5

B2- The following statements are related to the main characteristics of multiple performance measurement systems (MPMs). On the scale below, please indicate the nature of PMS adopted by your company by rating the extent to which you agree or disagree with the following statements by circling the appropriate number for each statement.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	1	2	3	4	5
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5

B3- This section relates to the importance of performance measures used by your company. Using the scale below, please rate the importance/success each of the categories of performance measures listed below in meeting your company's needs, by circling the most appropriate number for each item.

Not important	Slightly important	Moderately important	Significantly important	Considerably important
---------------	--------------------	----------------------	-------------------------	------------------------

	1	2	3	4	5
1	Financial performance measures (e.g. ROA, ROS, ROI, Budget practices etc.).				1 2 3 4 5
2	Operational performance measures (e.g. productivity, quality, cycle time, etc.).				1 2 3 4 5
3	Customer perspective-based measures (e.g. market share, customer satisfaction, on-time delivery etc.).				1 2 3 4 5
4	Innovation & learning-based measures (e.g. new products/service, employee satisfaction, training, etc.).				1 2 3 4 5
5	Environmental & community perspective-based measures (e.g. public image, environmental friendly, community involvement, etc.).				1 2 3 4 5

B4- Please circle the appropriate number on the 5-point scales below to indicate the extent to which your company's performance measurements system serves the following different purposes:

	Not at all 1	To a slight extent 2	To a moderate extent 3	To a significant extent 4	To a considerable extent 5
1	To evaluate capital investments (<i>long-term</i>).				1 2 3 4 5
2	To appraise economic performance (<i>financial & market performance</i>).				1 2 3 4 5
3	To appraise managerial performance (<i>the extent to which company's aims are achieved</i>).				1 2 3 4 5
4	To inform decision making.				1 2 3 4 5
5	To manage and appraise operational performance (<i>cost efficiency improving of the quality and productivity etc.</i>).				1 2 3 4 5
6	To manage company's strategy implementation.				1 2 3 4 5
7	To reward employees and managers.				1 2 3 4 5

B5- According to the following statements, please indicate your assessment and level of satisfaction with multiple performance measurement systems used by your company. On the scales below, please circle the appropriate number for your answer.

(1= Does not meet expectations, 3= moderately meets expectations, 5= exceeds expectations)					
1	How well the MPMs of your company currently meet expectations.				1 2 3 4 5
(1= not at all ideal, 3= moderate ideal, 5= very close to ideal)					
2	How well the current MPMs compare to your understanding of the concept of an 'ideal' system,				1 2 3 4 5
(1= not at all satisfied, 3= moderately satisfied, 5= completely satisfied)					
3	Overall satisfaction with the MPMs of your company.				1 2 3 4 5

Part 3- This relates to descriptions of contingency factors influencing the extent of MPMs usage

C- This section seeks to identify the type of business/competitive strategy adopted by your company during the last 3 years. Competitive strategy is measured according to Miles and Snow's (1978) typology (defender and prospector).

The following statements describe the type of strategic emphasis adopted by your company. On the scale below, please circle the appropriate number between 1 to 5 which most closely represents your true belief about your company's competitive strategy.

	Totally disagree 1	Disagree 2	Neutral 3	Agree 4	Totally agree 5
1	Your company always tends to access new markets rather than focusing on selling prices, quality, efficiency and customer service in your current market.				1 2 3 4 5
2	Your company focuses on searching for new market opportunities rather than focusing only on market opportunities available in its current marketplace.				1 2 3 4 5
3	Your company primarily seeks to differentiate its products and services from those of competitors rather than providing products and services at the lowest possible price.				1 2 3 4 5

4	Your company focuses more on increasing market share and/or sales growth rather than maximizing short-term earnings.	1	2	3	4	5
5	Your company focuses more on improving and innovating products/services rather than focusing most on high efficiencies (reducing expenditure and cost).	1	2	3	4	5
6	Your company always seeks to introduce unique and new products/services rather than focusing on high production volume.	1	2	3	4	5
7	To cope with different external environmental changes, your company usually tries to initiate change rather than resisting change.	1	2	3	4	5

D- The questions D1 and D2 below relate to the External environment during the last 3 years. This is measured in terms of the degree of perceived environmental uncertainty (managers' perceptions of the level of uncertainty) and the intensity of competition that your company has faced over the previous three years.

D1- This relates to extent of change in the company's external environment. On the scale below, please indicate the extent to which the following items are predictable by managers in your company by circling the appropriate number between 1 and 5 for each statement.

	To a considerable extent 1	To a significant extent 2	To a moderate extent 3	To a slight extent 4	Not at all 5
1	Customer demands, tastes and preferences.				1 2 3 4 5
2	Technological environment.				1 2 3 4 5
3	Economic environment.				1 2 3 4 5
4	Government regulation and policies.				1 2 3 4 5
5	Market activities/actions of competitors.				1 2 3 4 5
6	Industrial relations.				1 2 3 4 5
7	Deregulation and globalisation.				1 2 3 4 5

D2- Please indicate, on the scale below, your estimate of the intensity of competition that your company is facing in its marketplace by circling the appropriate number between 1 and 5 for each statement that follows.

	Not at all 1	To a slight extent 2	To a moderate extent 3	To a significant extent 4	To a considerable extent 5
1	Price competition.				1 2 3 4 5
2	Competition for marketing and distribution channels.				1 2 3 4 5
3	Competition for new products/service development.				1 2 3 4 5
4	Competition for market share.				1 2 3 4 5
5	Competition relating to the quality and variety of products/service and customer service.				1 2 3 4 5
6	Competition in your industry/market segment.				1 2 3 4 5

E- The questions E1 and E2 below relate to Organisational structure during the last 3 years. It refers to Decentralisation (the level of autonomy delegated to managers) and Formalisation (the level of existence of formal rules, regulations and job descriptions).

E1- This section seeks to discover to what extent authority has been delegated to the appropriate managers. Please circle the number that best describes the extent to which decisions are delegated to middle/operational managers by top management in your company (please answer all questions).

	Never delegated 1	Rarely delegated 2	Sometimes delegated 3	Often delegated 4	Always delegated 5
1	Decisions about development of new products/services.				1 2 3 4 5
2	Decisions related to pricing policies.				1 2 3 4 5
3	Decisions about hiring and firing managerial personnel.				1 2 3 4 5

4	Decisions about major changes to processes (e.g. introduction of new manufacturing technology).	1	2	3	4	5
5	Decisions about selecting large investments.	1	2	3	4	5
6	Decisions related to allocating/setting capital budgets.	1	2	3	4	5
7	Decisions about entering new markets.	1	2	3	4	5

E2- The following statements relate to procedural regulations and job descriptions. On the scale below, please indicate to the extent of formalisation in your company by rating the extent to which you agree or disagree with the following statement by circling the appropriate number for each statement.

	Strongly disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly agree 5
1	In your company all rules and procedures are very clearly documented.				1 2 3 4 5
2	In your company violation of the documented procedures is not tolerated.				1 2 3 4 5
3	Your company has definite and formal rules and regulations for all administration procedures.				1 2 3 4 5
4	There are strong penalties for failure to comply with established procedures.				1 2 3 4 5
5	Whatever a situation arises, there are policies and procedures to follow in dealing with it.				1 2 3 4 5

F- This section seeks to identify the level of use of Information technology applications (i.e. all forms of IT such as computer hardware, software, and related devices) within your company during the last 3 years.

F1- The following statements are related to information technology applications. Using the scale below, please indicate to what extent the different applications of Information technology are used by your company by circling the appropriate number between 1 to 5 for each statement.

	Not at all 1	To a slight extent 2	To a moderate extent 3	To a significant extent 4	To a considerable extent 5
1	Your company uses a computer network (intranet) to enhance internal communication between people across the company.				1 2 3 4 5
2	Your company uses the internet or similar external data networks to communicate or exchange information with parties (creditors, investors, government agencies) external to your company.				1 2 3 4 5
3	Your company's managers can easily access information, share it among various internal systems within the organisation and exchange it with other parts (e.g. customers, creditors etc.) by different electronic means.				1 2 3 4 5
4	Many different informational applications related to control and accounting (e.g. procurement, account payable, account receivable, billing, management performance reporting, expense analysis, business profitability measuring/reporting, revenue forecasting, payroll, cost accounting, financial analysis, budgeting) are used in your company to support business processes and different activities.				1 2 3 4 5
5	Many different technological applications (e.g. office support system, database system, accounting application, computer-assisted production management, computer-aided design, computer-aided manufacturing, local area network, external network) are presently implemented in your company.				1 2 3 4 5
6	Documents are maintained using imaging technologies within a database management system.				1 2 3 4 5
7	Employees can easily retrieve information from various databases for decision-making support (e.g. cost information, reporting tools).				1 2 3 4 5
8	Business transactions are conducted with suppliers/customers using EDI (electronic data interchange).				1 2 3 4 5
9	Customers can customise their orders online without phone/fax or face-to-face interaction.				1 2 3 4 5
10	All product/service-related information is available on line (e.g. product/service descriptions, price, etc.).				1 2 3 4 5

