Non-financial performance measures-organizational performance relationship in the Bangladeshi firms: the moderator role of environmental uncertainty and corporate culture

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Abstract:

Aims: This paper empirically examines the role of environmental uncertainty and corporate culture on the relationship between non-financial performance measures and organizational performance from manufacturing firms in Bangladesh. Specifically, it investigates the hypothesis that non-financial measures of performance lead to improved organizational performance under circumstances of increased environmental uncertainty and corporate culture.

Design/Methodology: Data from a sample of 61 manufacturing firms listed on Dhaka Stock Exchange (DSE) in Bangladesh were collected. Data were then analyzed using multiple regression and factor analysis of multivariate statistical tool.

Findings: Results show that there is a negative but statistically significant relationship regarding the impact of environmental uncertainty on the relationship between non-financial measures and firm performance. The results also advocate that sample Bangladeshi firms make greater use of non- financial measures with the aim of improving firm performance when environmental uncertainty is low. Conversely, the study finds positive relationship between flexibility type corporate culture and the organizational performance, and the moderating effect of this cultural type on the non-financial performance measures- organizational performance linkage.

Practical Implications/ limitations: The results of this study must be interpreted with caution since it concentrates only on small sample manufacturing firms.

Originality/value: To the best of our knowledge, the study is first to provide evidence on the environmental uncertainty and corporate culture affecting the use of non-financial performance measures and firms performance in the context of a developing country, in particular in Bangladesh.

Keywords: ***Non-financial performance measures; Environmental Uncertainty; Performance, Bangladesh, Manufacturing industry, Corporate culture.***

1. Introduction

In recent years managers of organizations have put less prominence on traditional accounting based performance procedures since financial measures do not reveal a firm's complete performance (e.g., Hoque and James, 2000; Lynch and Cross, 1991; Kaplan and Norton, 1996, 2001; Otley, 2003; Shields, 1997; Ishtiaque et al., 2007). Seminal research by Johnson & Kaplan (1987) found that the basis of performance measurement should include non-financial measures such as quality, time of delivery, flexibility and innovation. Non-financial performance measures focus more on a firm's long-term success, and factors such as customer satisfaction, internal business process efficiency, innovation and employee satisfaction lead to improved organizational and financial performance (Lynch and Cross, 1991; Kaplan and Norton, 1996, 2001; Otley, 1999; Veen et al., 2002; Banker et al., 2000; Ghalayini & Noble, 1996; Chenhall, 2003; Ittner & Larcker, 1998; Gordon & Miller, 1976; Kaplan & Norton, 1996). A positive association has been found between the firms' performance and use of non-financial measures (Banker et al., 2000; Ittner & Larcker, 1996).

Conversely, studies suggest that there is also complexity in connecting the use of non-financial measures to performance (Fisher, 1995); there is difficulty in quantifying any links between non-financial measures and performance (Brancato, 1995), and there is an absence of any significant link between non-financial measures of quality and customer satisfaction and financial performance (Ittner and Larcker, 1998). Earlier findings thus give mixed results on performance measures and organizational performance relationship. Kaplan and Norton (1996, 2001) suggest that non-financial performance measures help managers to assess the changes in their business environments, determine and evaluate progress towards the firm's goals, and affirm achievement of performance. Studies have noted that non-financial performance measures offer managers a basis of managing the drivers of preferred outcomes (Lynch and Cross, 1991; Shields 1997; Otley, 1999; Hoque and James, 2000; Veen-Dirks and Van and Wijn, 2002). As a result, researchers argued that non-financial measures of performance are most functional in improving organizational performance in an existence of high environmental uncertainty. Few empirical studies however support this claim. Hoque (2005), for example, noted that performance should be a declining function of the size of the 'mismatch' between an organization's environment and use of the different

combinations of non-financial performance measures. More recently, Jusoh (2008) found ample evidence on the role of multiple performance measures - conceptualized according to the BSC framework - on the relationship between perceived environmental uncertainty and firm performance. Despite the effort to link environmental uncertainty and organizational performance research in the developed world, little is known about the state of uncertainty in the environment and non-financial measures with regard to the performance of firms in developing countries and in particular, none seems to have attempted in the context of Bangladesh (Khan et al., 2010). Likewise, other contextual factor such as corporate culture could have an impact on the use of organizational multiple perspectives of performance measurement systems. Ismail (2007, p. 512) stated "… one of the issues that was not much tested is the impact of organizational culture on the performance evaluation system, which could have influence managements selection of performance evaluation indicators". Henri's (2006) study on 383 Canadian industrial firms to examine the relationship between organisational culture and the design and use of control systems reveals that firms top managers that reflect a flexibility dominant type of culture tend to use a diverse set of financial and non-financial measures and, use the broader perspective of performance measures to focus organizational attention, support strategic decision-making and legitimate actions progressively than top managers of firms reflecting a control dominant type of culture.

The Bangladesh research on management accounting systems focuses more on the traditional cost accounting practices. To illustrate, Sharkar et al., (2006) and Mozumder (2007) analyzed the practices of cost accounting using a sample of industrial manufacturing firms, and results revealed that budgetary control is the dominant cost accounting practice in Bangladesh followed by standard costing, absorption and marginal costing. There has also been a dearth of interest in the adoption of contemporary management accounting systems. Akhter (2007) for example conducted a study to identify the practices of activity-based costing (ABC) and other contemporary management accounting techniques in metal and engineering industries. The results show that none of the business units in their sample were actually using ABC and that only five percent were thinking of implementing it in the near future. Marium (2002), through an opinion survey, attempts to see the use of non-financial performance measures with special reference to BSC model on private commercial banks performance. Results revealed that a number of prerequisites (such as information systems, investment in tangibles etc) are available for this sector to incorporate non- financial measure as a performance

measurement tool and top management showed positive attitude towards these measures, however none had been implemented. In recent year, Mosarraf and Ahmed (2008) examined ten pharmaceuticals companies to see the existence of non- financial measures in evaluating their organizational performance along with traditional financial measure. The results demonstrate that companies predominantly follow financial measures with some non-financial measures, emphasizing such factors as human resources efficiency, employees' performance and satisfaction, R &D development, and time taken for new product launching. Mosarraf and Ahmed (2008) found that organizations trust the importance of non-financial measures for evaluating of business performance in spite of their unfamiliarity with tools such as Balanced Scorecard (BSC). Hussain (2008) conducted a case study on a leading mobile phone company in Bangladesh, the results of which show that the company relies both on financial and non-financial measures. Hence, the most recent research in Bangladesh shows a gradual shifting from traditional management accounting techniques to new and sophisticated techniques. This possibly occurs as a result of increased competition between local and multinational organizations, attainting competitive advantages, and a more positive attitude towards retaining their customer base (Hussain, 2008). Khan and Halabi (2009) in their study on multinational companies of Bangladesh evidenced that BSC, as a key performance measurement tool, helps in strategic management by linking some strategically significant, relevant, and interrelated measures indicators with organizational emphasis on knowledge and learning initiatives. Khan et al., (2010) in another study examined the impact of two contingent factors such as market competition and business strategy for the use of multiple performance measures taking a sample of 50 manufacturing firms. Their study report that Bangladeshi firms use non- financial measures while facing intense competition and the use of these comprehensive measures differs between firms pursuing prospector and defender strategy. A recent study by Khan et al., (2010) examines the underlying hypotheses of the balanced scorecard (BSC) focusing on leading manufacturing and service companies based in Bangladesh. Their results show that the BSC perspectives are positively correlated with each other at a statistically significant level and in a sequential way. Furthermore, Khan et al., (2011) in their another very recent study on the extent and use of BSC and multiple performance measures in Bangladeshi manufacturing and service firms show that level of BSC adoption in Bangladeshi firms is significantly low, however, the use of non- financial indicators are found high (above 80% firms within sample).

Given a growing body of study linking the country Bangladesh and management accounting systems exists, there has been no study examining the link between different dimensions of non- financial performance measures and the firms' performance when environmental uncertainty (EU) and corporate culture (CC) is seen as a moderator variable. Further there exists no clear empirical evidence of the relationship between environmental uncertainty, corporate culture, and the organizational performance in the specific context of Bangladesh.

Therefore, the aim of this study is to investigate the moderator effect of EU and CC on the relationship between the use of non-financial performance measures and organizational performance in manufacturing firms. More specifically, the present study is an attempt to observe the moderating role of EU and CC on the impact of the use of non-financial performance measures on improved organizational performance.

The remainder of the paper is organized as follows: The next section (section two) describes literature review, followed by developing the research hypothesis. Section three outlines the research methodology applied. The empirical results appear in section four, followed by discussion of the results along with concluding remarks regarding the limitations and implications of the study in section five.

2. Prior research and hypothesis development

2.1. EU and non- financial measures

Higher levels of EU affecting the performance of firms are connected with greater reliance on the non-financial performance measures. To illustrate, Gul (1991) noted that when EU is high, sophisticated managerial accounting systems enhance performance. This is also highlighted in previous research exploring the relationship between EU and organizational characteristics, for example, management accounting and control systems (e.g. Gordon & Miller, 1976, Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Ezzamel, 1990; Mia, 1993). The general conclusions of these studies are that performance measures are more likely to be external and broader-based, future oriented, non-financial and qualitative when the environmental uncertainties are considered high (Miles and Snow, 1978; Hoque, 2005). The idea of confronting environmental uncertainty has intensified in a significant manner within the last two decades by such factors as manufacturing and operations technologies, customer tastes and preferences, market demand, relations with customers and suppliers, distribution channels, number of competitors and their actions, deregulation and globalization and relations with stakeholders (Miles and Snow, 1978; Hamel and Prahalad, 1994; Cooper,

1995; D'Aveni, 1995; Goldman et al., 1995 ; Hoque, 2005). Kaplan and Norton (1996, 2001) stated that non-financial performance measures might enable a firm to address EU by clearly monitoring the core competencies of the organizational processes while simultaneously creating greater efficiency.

Because the degree of environmental uncertainty (dynamism and hostility) increases, an organization needs to incorporate more non-financial data into its accounting information system and adopt a fairly sophisticated control system (Gordon and Miller, 1976). Further, EU is associated with the characteristics of the management accounting information and higher environmental uncertainty is positively associated with higher importance of external, non-financial, and ex ante, as well as broad scope type information (e.g. Gordon and Narayanan, 1984; Chenhall and Morris, 1986; Mia, 1993) . Govindarajan (1984) reports that financial data alone would be less necessary to assess managerial performance in a situation with high environmental uncertainty. Govindarajan and Shank (1992) suggest that when the environment is highly uncertain, management must consider how to cope with uncertainties. Measuring effectiveness of the firm therefore requires management's greater reliance on non-financial measures (e.g. market share, customer satisfaction, efficient use of R&D dollars, efficiency and quality etc) in a highly uncertain situation (Chenhall and Morris, 1986; Govindarajan, 1984). Gordon and Narayanan (1984) argue that the operating environment should be the major consideration in designing management accounting systems. They study on senior managers from 34 firms found that the EU is related to the extent to which their information systems emphasize external, non-financial and future-oriented information.

The effectiveness of an organization control system thus requires management's knowledge of the organization's external environment to determine the 'fit' or alignment among the different organizational elements (Otley, 1980; Chapman, 1997; Chenhall, 2003), and between an organization's external environment and use of multiple performance measures in the performance evaluation process (Van de Ven and Drazin, 1985; Otley, 1980; Chapman, 1997; Tymon et al., 1998; Lynch and Cross, 1991; Brancato, 1995; Ittner and Larcker, 1998). Scholars argue that the external environment is viewed as the degree of predictability where changes are difficult to foresee due to instability and turbulence (Duncan, 1972; Miles & Snow, 1978). A number of contingency studies in accounting provide empirical evidence to support this view (for example, see Govindarajan, 1984; Gordon and Naryanan, 1984; Chenhall and Morris, 1986; Ezzamel, 1990; Mia, 1993; Gul, 1991; Gul and Chia, 1994; Hoque and Hopper, 1997; Hoque, 2004; Widener, 2006). Hoque (2005) stated that non-

financial performance measures are more likely to affect performance under higher environmental uncertainty. This occurs because non-financial measures are likely to facilitate organizational decisions and actions that support strategies based on the needs of stakeholders, internal and external customers, regulatory bodies, managers, and employees (see also Chapman, 1997).

2.2. Corporate culture and non- financial measures

Organisational culture, as another contingent factor, is likely to affect the use of non-financial performance measures. Henri (2006, p. 82) stated, "…as a part of control practices and organizational activities, the use of performance measurement system and the multiplicity of measurement are also influenced by organizational culture". While the importance of organisational culture in examining the use of multiple performance measures, there are little studies that have considered organisational culture as a contextual factor (Chenhall, 2003, 2007; Henri, 2006). Chenhall (2007, p. 188) stated, "Little work has been devoted in the area of organizational culture and MCS design". Franco-Santos (2007) finds that organisational culture has a significant impact on the use of financial and non-financial measures in executive's annual incentive payments. Their findings indicate that organisational culture is likely to influence the design and usage of non- financial performance measures and organizational performance. Of late, Verbteen and Boons (2009) findings also evidenced that the usage of non-financial performance measures and performance is influenced positively by organisational culture. Earlier studies investigating the effect of organizational culture on performance measurement design have used a competing value model (e.g., Bhimani, 2003; Henri, 2006; Deshpande & Farley, 2004). Organizational culture rooted in such model is classified into four categories namely the competitive or rational culture, the entrepreneurial or the developmental (adhocracy), the bureaucratic (hierarchy) culture, and the consensual or group (clan) culture (Cameron & Quinn, 2006; Bhimani, 2003). While the rational culture concentrates on competitive advantage, market superiority, the entrepreneurial nature of corporate culture focuses on innovation, risk-taking, developing new knowledge (Bhimani, 2003). That bureaucratic culture focuses on regulations, formal rules and procedures, the consensual or group (clan) culture is however, typified by loyalty and tradition (Bhimani, 2003; Deshpande & Farley, 2004). In the literature, market and hierarchical culture denote the value of control with special focus on external, whereas the adhocracy and clan culture delineate the value of flexibility having internal focuses (Gomes et al., 2007).

Pursuing a type of culture reflecting a flexibility values has a positive impact on the extent of qualitative performance measures (Gomes et al., 2007). Literature argued that the key grounds for gaining intense recognition on corporate culture stem from the argument that certain organizational cultures lead to superior organizational performance (Kotter and Heskett, 1992). Many studies evidence that the performance of an organization is dependent on the degree to which the values of the corporate culture are widely shared (see Deal and Kennedy, 1982; Denison, 1990; Kotter and Heskett, 1992; Ouchi, 1981). Similarly, others claim that organizational culture is linked to performance is founded on the perceived role that corporate culture can play in creating competitive advantage (see Scholz, 1987). However, by the end of last century, researchers assessing the links between corporate culture and performance were more watchful. To illustrate, studies mention that there is a link between certain corporate culture characteristics and performance but corporate culture will remain linked with superior performance in the events only when it is able to adapt to changes in external environmental conditions (Gordon and DiTomaso, 1992; Denison, 1990). Similarly, others argued that widely shared and strongly held flexibility type cultural values enable management to envisage employee reactions to certain strategic options result in minimizing the scope for undesired consequences (Ogbonna, 1993). Therefore, while, some researchers have questioned the universality of a culture–performance link, adequate evidence exists to suggest that corporate culture is associated with organizational performance (Gomes et al., 2007).

This paper thus intends to assume the relationship between the use of non-financial performance measures and firms' performance moderated by EU and CC. As a result, the current study posits the following theoretical model (see figure 1). From figure 1, and the related literature, the following hypothesis (H1) is formally stated:

H1: ***The positive association between the use of non-financial performance measures and organizational performance is greater (a) when environmental uncertainty is more intense (b) when group cultural type is pursued in Bangladeshi firms.***

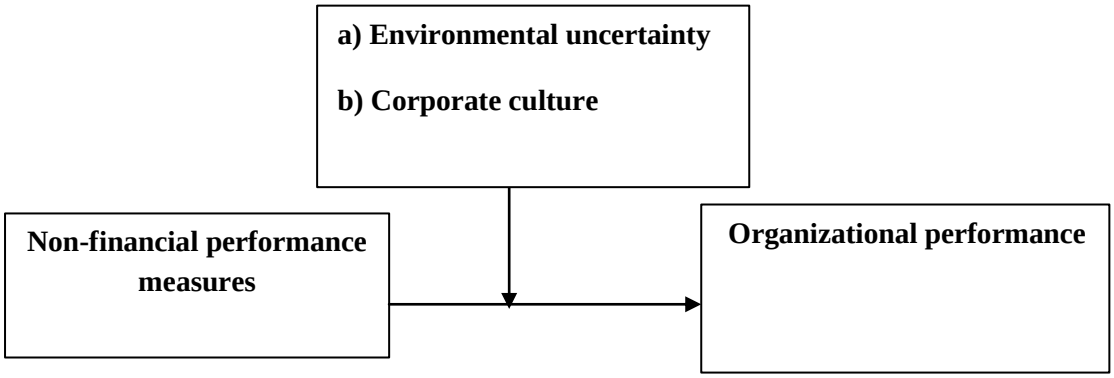

Figure 1: Hypothetical Model

3. Research design

The study uses survey method of data collection. Primary data were collected by way of a questionnaire survey method. The draft questionnaires, based on the review of literatures, were developed and circulated to a group of prominent academicians, management consultants and chief financial officers (CFOs) for feedback as a part of a pilot study. Based on their suggestions, the questionnaires were revised. Questionnaires[2] (along with the instructions sheet) were then mailed to the chief executive officers of 120 leading Bangladeshi's manufacturing companies randomly selected from the Dhaka Stock Exchange (DSE). The manufacturing industry is viewed as an appropriate area of study as manufacturing firms are considered highly competitive and vulnerable to environmental changes (Khan et al., 2010). Moreover, the manufacturing industry is an important engine of growth for Bangladesh's GDP (Gross Domestic Products) as this sector contributes 29.77 percent of GDP at constant prices for FY 2009-10 (Bangladesh Economic review, 2009). A mail-out survey was adopted as it enabled the gathering of information from a broad cross-section of firms at a relatively low cost and has been successfully used in other management accounting studies (Chenhall, 2003; Gosselin, 1997; Shields, 1995). The questionnaires, with a covering letter and a prepaid postage, self-addressed envelope were first mailed during February 2009. Two reminders were also sent (one in March, and the second in April). In the covering letter, an assurance was given to the CFOs that the identity of the respondent companies and the respondent would be kept strictly confidential and only aggregate generalizations would be published. This was also a requirement of the university ethics committee. In total, 61 respondents completed the questionnaire representing a response rate

of 50.83 %. This rate compares favourably to other like studies (for example Hoque, 2005 had a 52% response rate in a survey mailed to 100 New Zealand companies). In this study, statistical test was also conducted to reveal the existence of possible response bias, t-tests for two independent samples by considering first and second mailing returns as suggested by Oppenheim (1966). Our results indicate no significant results between early and late respondents.

The firms surveyed employed between 75 and 1200 employees, with annual sales between BD Tk.10 million and BD Tk. 500 million, and capital employed between BD Tk. 5.5 million and BD Tk.400 million.

4. Results

4.1. Measurement of variables

4.1.1. Environmental uncertainty (EU)

Environmental uncertainty (EU) takes place when administrators perceive an organization's environment to be unpredictable. As such it reveals the unpredictability in the actions of the task environment comprising customers, suppliers, competitors, labor unions, and regulatory groups (Duncan, 1972; Bourgeois, 1985). In the present study, EU was measured using eight items adapted from Khandwalla (1972), Govindarajan (1984) Gordon and Narayanan (1984), and later used by Hoque (2005) without any modification. Respondents were asked, on a five-point Likert scale ranging from 1 (very predictable) to 5 (very unpredictable) to indicate their surveillance of the relative expectedness of the eight items of the firm's environment. Prior to performing a principal components analysis (PCA), the suitability of data for factor analysis was assessed. An inspection of the correlation matrix revealed the presence of many coefficients of 0.30 and above, signifying that factor analysis is considered appropriate (Pallant, 2001). The Bartlett test of sphericity and Kaiser-Meyer-Olkin (KMO) were also used to assess the factorability of the data. The results indicate that the Bartlett Test of Sphericity (Bartlett, 1954) reached statistical significance (Chi-Square = 929.65, $p < .01$) and the Kaiser- Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.76, exceeding the recommended value of 0.60 (Kaiser, 1974). These results suggest that the factorability of the data was appropriate. A principal components analysis (PCA) with Varimax rotation was then performed that yielded one factor with an eigenvalue greater than 1.0. This explained 72.8% of the total variance. To facilitate the analysis, a single scale was constructed by taking the average of respondents' scores for the eight items within the factor[1]. A reliability check

for this measure produced a Cronbach's alpha (Cronbach, 1951) of 0.75, which is assumed to be well above the lower limits of common acceptability (Nunnally, 1978). Descriptive statistics and the results of the factor analysis appear in following Table 1.

Table 1: Descriptive statistics and Principal Components Analysis (PCA) of the EU (n= 61)

Items	**Mean**	**S.D.**	**Factor Loadings**	**Percentage of Variable Explained**
1. Suppliers' actions	3.02	1.28	0.850	72.8 %
2. Customer demands, tastes and preferences	2.97	1.37	0.839	
3. Deregulation and globalization	3.95	0.90	0.805	
4. Market activities of competitors	3.84	0. 99	0.785	
5. Production and information technologies	3.39	1.08	0.785	
6. Government regulation and policies	3.58	1.18	0.732	
7. Economic environment	3.00	1.36	0.706	
8. Industrial relations	3.88	0.97	0.684	

4.1.2: Non-financial performance measures

Questions on the use of non-financial measures included thirteen items similar to that developed by Hoque and James (2005; 2000) and earlier by Kaplan and Norton (1996). These items are shown in figure 2.

Figure 2: Non-financial performance measures.

Dimensions	Performance measures
Customer	Market share; customer satisfaction survey; on time delivery; customer response time and warranty repair cost.
Internal business process	Material and labor efficiency variance; process improvement and reengineering; new product introduction; and long-tern relations with suppliers
Learning and growth	Staff development and training; workplace relations; employee satisfaction; and employee health and safety.

Respondents were asked on a five-point scale ranging from 1 (to a very little extent) to 5 (to a very great extent) to specify their organization's use of the stated measures in performance evaluation. A principal components analysis (PCA) with Varimax rotation was also performed for these measures; again, prior to this the suitability of data for factor analysis was assessed. An inspection of the correlation matrix revealed the presence of many

coefficients of 0.30 and above, signifying that factor analysis is considered appropriate (Pallant, 2001). The Bartlett Test of Sphericity and Kaiser-Meyer-Olkin (KMO) were again used and the results indicate that the Bartlett Test of Sphericity reached statistical significance (Chi-Square = 929.65, $p < .01$) and the Kaiser- Meyer-Olkin (KMO) measure of sampling adequacy was 0.76. From the PCA of the thirteen items, three component factors with eigenvalue greater than 1.0, were extracted, which explained 71.5% of the total variance More specifically, factor 1 contributed 36.03%, factor 2 21.79%, and factor 3 14.3%. A single scale was then built for each factor by taking the average of respondents' scores for each item within the factor. It should be pointed out that, although each non-financial factor is comprised of a number of separate measures, the clusters made intuitive sense, and they were interpreted as representing the extent to which organizations used the customer, internal business processes and learning and growth perspectives for performance evaluation. Table 2 presents the descriptive statistics and the results of the factor analysis. The Cronbach's alphas for the customer, internal business processes and learning and growth perspectives were 0.82, 0.76 and 0.79 respectively, demonstrating an acceptable internal reliability of these scales.

Table 2: Descriptive statistics and the results of the PCA of the non-financial performance measures items (n= 61)

Items	**Mean**	**SD**	**Factor Loading (Customer perspective) Factor 1**	**Factor loading (Internal business perspective Factor 2**	**Factor loading (learning and growth perspective) Factor 3**
Material and labor efficiency variance	4.50	0.68		0.91	
Process improvements and reengineering	3.34	1.48		0.73	
New product introduction	3.85	0.97		0.68	
Staff development and training	3.56	1.13			0.82
Customer satisfaction survey	3.75	1.09	0.86		
On-time-delivery	4.19	0.83	0.72		
Long-term relations with suppliers	3.15	1.01		0.84	
Workplace relations	3.01	1.05			0.69
Employee health and safety	3.53	1.11			0.80
Market share	2.99	1.02	0.55		

Warranty repair costs	2.90	1.15	0.61		
Customer response time	3.10	1.02	0.73		
Employee satisfaction	3.25				0.67
Percentage of variance explained			36. 03%	21.79%	14.3%
Total percentage of variance explained			**71.5%**		
Cronbach alphas value			**0.82**	**0.76**	**0.79**

Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization; Rotation converged in 6 iterations.

4.1.3. Corporate culture

In line with previous studies (see Bhimani, 2003; Franco-Santos, 2007; Henri, 2006), the study uses the competing value model to operationalize organisational culture. In other words, organisational culture was operationalized as a group (flexibility) culture, an approach similar to others (e.g., Bhimani, 2003; Franco-Santos, 2007; Henri, 2006). Five items was used to measure organisational culture (see table 3 below) which were later subject to factor analysis to test unidimensionality of the construct. Respondents were asked on a five-point Likert-type scale to what extent does their companies emphasise the culture values anchored at 1 (to a very little extent) to 5 (to a very great extent). As shown in the table 3 that only one factor had an eigenvalue greater than one with the total variance explained by the factor were 62.77%. The reliability test (Cronbach alpha) was also conducted yielding value of 0.893, which indicates satisfactory internal reliability of the scale. The Bartlett's test of sphericity was significant (p = 0.000) and the value for KMO was 0.712. All loadings were greater than 0.40, ranging from 0.605 to 0.885. A single scale was constructed by taking the average of respondents' scores for the five items.

Table 3: The results of the PCA of the corporate culture items (n= 61)

Items	**Factor loadings**
My company is human-oriented; people seem to share a lot of themselves	0.792
The glue that holds my company together is loyalty and tradition	0.772
The head of my company is generally considered to be a mentor	0.605
My company emphasises human development high level of trust and participation	0.885
Management style in my company is characterised by teamwork	0.693
Kaiser Meyer Olkin (KMO) = 0.712, Cronbach Alpha = 0.893; The total variance explained by the factor = 62.77%.	

4.1.4. Organizational performance

Organizational performance was measured using twelve items adapted from Govindarajan (1984) and latter used by Hoque (2005), Abernethy and Guthrie (1994), Abernethy and Stoelwinder (1991), Chenhall and Langfield-Smith (1998), Chong and Chong (1997) and Govindarajan and Gupta (1985). The twelve measures were: operating profits, ROI, sales growth rate, market share, cash flow from operation, new product development, market development, R&D, cost reduction programs, personnel development, workplace relations and employee health and safety respectively. Respondents were asked, on a five-point scale ranging from 1 (below average) to 5 (above average). To test the hypothesis, a single global performance score for each firm was computed by taking the average for all items. Table 4 provides descriptive statistics for all variables. The Cronbach's alpha for this measure yielded a value of 0.83.

Table 4: Descriptive statistics and reliabilities measures for all variables (n= 61)

Variables	Number of items	Mean	Standard Deviation	Min	Max	Cronbach's alpha
Customer perspective	5	3.99	0.94	3.00	5	0.78
Internal business processes perspective	4	3.42	1.08	2.00	5	0.67
Learning and growth perspective	4	4.01	0.88	3.00	5	0.83
Overall non-financial measures	13	3.08	1.35	3.23	5	0.85
Environmental uncertainty	8	3.03	0.77	3	5	0.79
Corporate culture	5	3.4	0.22	2	5	0.89
Organizational performance	12	3.85	1.05	1	5	0.81

A correlation matrix using the Pearson product-moment coefficient for all variables was then computed and the results displayed in Table 5. Table 5 shows that many variables illustrate significant bi-variate relationship with each other. Environmental uncertainty (EU) shows a significant negative correlation with internal business process (r = -0.24, $p < .05$) and financial performance (r = -0.23, $p < .01$). Several non-financial dimensions are significantly correlated with each other, suggesting that multicollenearity is likely to exist. The correlations between the non-financial perspectives are likely since these perspectives are assumed to be linked by the cause-and-effect relationships (Kaplan and Norton, 1996). Although the cause-and-effect is not easy to prove, the strong association between the three perspectives in these results suggests such a relationship. However, according to Pallant

(2001), r = .90 and above indicates that variables are highly correlated. From Table 4, none of the correlation coefficients is greater than .90. Also, after performing tolerance and variation inflation factor (VIF) tests, none of these tests detected multicollenearity among the variables (VIF< 10, Hair *et al*, 1998). Thus it can reasonably be concluded that there is no potential major problem for conducting the regression analysis.

Table 5: Pearson Correlations (n= 61)

Code	Variables	CUSP	IBP	LGP	OVNFPM	EU	CC	OP
CUSP	Customer perspectives	**1**						
IBP	Internal business process	**0.65****	**1**					
LGP	Learning and growth	**0.57****	**0.69****	**1**				
OVNFPM	Overall non-financial performance measures	**0.78****	**0.76****	**0.81****	**1**			
EU	Environmental uncertainty	**0.05**	**-0.24***	**0.17**	**-0.23***	**1**		
CC	Corporate Culture	**0.17**	**0.32***	**0.55****	**0.49****	**0.15**	**1**	
OP	Organizational performance	**0.47****	**0.34***	**0.31***	****0.46**	**0.12**	**0.65****	**1**

**** Correlation is significant at the 0.01 level (2-tailed)**

***Correlation is significant at the 0.05 level (2-tailed)**

4.2. Hypothesis Testing

To test our proposed hypothesis H1, a regression model was run based on the following equation:

$$\mathbf{Y= \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_1 X_2 + \beta_5 X_2 X_3 + e_i}$$

Where **Y** = Organizational performance (Dependent variable)

$\mathbf{X_1}$= Environmental uncertainty (EU); $\mathbf{X_2}$= Non-financial performance measures (NFPM); $\mathbf{X_3}$= Corporate culture (CC); $\mathbf{X_1X_2}$= the interaction term between EU & NFPM; $\mathbf{X_2X_3}$= the interaction term between CC & NFPM; $\boldsymbol{\alpha_0}$=constant; and $\mathbf{e_i}$ = the error term.

Tables 6 (a) and (b) show the summary results of the regression analyses, which indicate that the direct effect of the use of non-financial perspectives on organization performance is significant (β_2 = 0.02, t= 0.78, *p*=0.014**)**. The standardized beta coefficient for the interaction (β_3) between EU and non-financial performance measures is not positive and not significant (β_3 = -0.09, *t*= 0.39**,** *p*=0.647). The overall regression model for the explanatory variables explained 9.53% (Adjusted R_2) of the variance in the dependent variable, organizational performance (*F ratio* =3.56, *p*=0.245**)**. Therefore these results do not support the hypothesis

that increased use of non-financial performance measures would lead to improved organizational performance under conditions of increased environmental uncertainty. However, corporate culture is positively related to the use of non- financial performance measures and organizational performance in case of both direct effect (β_3*=0.351, t=2.45, p=0.034*) and interaction effects (β_3*=0.21, t=1.98, p=0.001*). As a result, while the proposition on the relationship between non-financial measures and organizational performance in the presence of higher EU is not supported in the case of the Bangladeshi manufacturing sector, the hypothesis that adoption of flexibility type corporate culture has a positive impact on the use of non- financial measures and organizational performance is supported. In other words, the above result support a direct relationship between organisational culture that emphasises flexibility values and the extent of multi- dimensional performance measures use. Cultural types that are believed to be associated with flexibility values are most likely to use information related to a measures encompassing both financial and non-financial measures than relying financial measures only (Henri, 2006; Franco-Santos, 2007). Overall, our hypothesis 1 is therefore partially supported, which confirmed the positive effect of cultural types associated with flexibility types on the use of non financial PMS (e.g. Bhimani, 2003; Franco-Santos, 2007; Henri, 2006).

Table 6 (a): Results of regression

	Coefficient β	**Standard error**	**t-value**	**p-value**
Constant	0.57	7.85	6.34	0.000
Environmental uncertainty **(X_1)**	-0. 45	0.24	-0.003	0.931
Non-financial Performance Measures **(X_2)**	0.02	0.25	0.78	0.014
Corporate Culture (**X_3**)	0.35	.12	2.45	0.034
Two way interaction between EU & NFPM **(X_1X_2)**	-0.09	0.10	0.39	0.345
Two way interaction between CC & NFPM **(X_2X_3)**	0.21	0.23	1.98	0.001

Table 6 (b):

Results of regression

Model	**R**	**R square**	**Adjusted R square**	**Durbin - Watson**	**F (3,42)**	**Sig**
	0.1534	**0.1255**	**0.0953**	**2.95**	**3.56**	**0.024**

5. Discussion, concluding remarks and limitations of the study

The current study examines the impact of environmental uncertainty and corporate culture on the relationship between use of non-financial performance measures and organizational performance in the context of Bangladeshi 61 manufacturing companies. The regression analysis does not show a positive association between firms' use of non-financial measures and their performance at an existence of moderator role of EU. In other words, EU does not produce a positive impact on firm's usages of multiples non-financial measures and their performance. These findings therefore are not consistent with previous studies that related to non- financial measures and firms' performance. Hoque (2005) for example, reveals that greater reliance on non-financial performance measures is associated with increased performance, but only when the level of EU within the organization is high, covering both financial and non-financial measures. The present study found a negative but significant relationship between EU and non- financial measures, indicating that the lower the degree of EU, the higher the use of non-financial performance measures. These results suggest that firms that face lower EU tend to use more non - financial performance measures. This finding is in contrast to management accounting literature and the results of other studies in relating to the use of firm's multiple performance measures and firms' performance (e.g. Mia, 1993; Gul and Chia, 1994; Gordon & Miller, 1976, Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Govindarajan, 1984). Significant positive relationships are however found between non-financial performance and overall firm performance. This might be attributed to recent research which highlights that Bangladeshi manufacturing firms are moving to incorporate non-financial measures in their performance evaluation (see Mosarraf and Ahmed, 2008; Hussain, 2008). The finding on the negative relationship between organizational performance and the moderator role of EU and the use of non-financial measures for firms' performance are somewhat consistent with findings reported by Hussain and Gunasekaran (2002) and Burney (1999). These studies reported that negative or antagonistic economic conditions (one element of EU) create higher pressures on management to increase profitability by using more financial performance measures, thus making it more complicated to measure non-financial performance. The Bangladesh manufacturing environment appears not to be as volatile as developed countries. Early research by Ahmed (1991) showed that Bangladeshi firms' have less domestic competition and although political unrest, but they attempt to attain steady growth. In the present study it

was found that EU (as evidenced by low mean score and standard deviations) is stable, which could be due to the small market size, and no massive direct foreign investment. Further a lack of technology and no major transformations in government policies and regulations encourage corporate managers to have a necessary belief that the business atmosphere is more stable and foreseeable.

In line with literature, the study found positive relationship between flexibility type corporate culture and the organizational performance and the moderating effect of this cultural type on the non-financial performance measures- organizational performance (Franco-Santos, 2007; Deal and Kennedy, 1982; Denison, 1990). As a result, unlike the contingent factor of EU that this current study failed to confirm in respect to their effect on the relationship between extent of non-financial performance measurement usage and organizational performance, corporate culture has impact on the extent of usage of non- financial performance measurement and organizational performance in Bangladeshi industrial companies.

There are a number of implications emanating from this current study. The first is in relation to managers. Managers must ensure their firms are adaptive and responsive to their environments, and need to use both financial and non-financial information in assessing performance. These measures must however be appropriate for the particular firm. The findings might also be useful to the designers of management accounting control systems in understanding how the degree of EU is indirectly associated with firm performance through the use of multiple performance measures. The results of this study could be applied to sectors other than manufacturing. To our knowledge, this study is first to provide evidence on the environmental uncertainty and CC affecting the use of non-financial performance measures and firms improved performance in the context of a developing country in particular in Bangladesh. The study would thus be a good source of reference and motivation for further inquiries. Similarly, the findings present an insight into the role of two contingency variables (EU and CC in this case) in defining firms' performance and non-financial performance measures. Contingency theory is argued to be the key domain for research in management accounting (Chenhall, 2007; Dent, 1990). This study support one of the key premises of contingency theory, that the suitability, usefulness and use of comprehensive performance measurement system are dependent on contexts in which a firm operates (Chenhall, 2003; Chenhall & Morris, 1986; Otley, 1999). In particular, this paper implicated to and extends the contingency theory literature by studying the impact of two key contingent factors on the non-financial performance measures usage and their moderating

effects on firms' performance (Hoque et al., 2001). The study provided original evidence to show that the use of non-financial performance measurement multiplicity is positively and significantly influenced by the flexibility type corporate culture that firms adopt (Franco-Santos, 2007).

The findings are, however, conditional on a number of limitations. These limitations provide an impetus for future research. The first limitation concerns the endogeneity problem regarding the measurement of variables that is commonly encountered in all cross-sectional studies a time-series study of similar business units facing different EU thus can address this limitation. The study is based on a small sample size (61 firms) within the manufacturing sector and the results cannot be generalized beyond the sample, the industry, or sample size. Although these businesses were randomly selected, future research with a larger sample could be done to validate these findings, and these could be conducted on service industries or the public sector. Furthermore, a number of well-known contingency variables such as organization size, competitive strategy, organization structures, intensity of competition, and the leadership technique of the CEO and customer profile have not been examined, and future research can attend to this issue. The study is limited to Bangladesh and it is possible that companies in other international settings may be different. The size of the Bangladesh economy, the nature of market competition, legal and regulatory constraints and economic policies or structures might vary across countries. Finally, similar to the most of contingency-based earlier studies, the study has not relied on mixed method (both survey and case studies) of data collection. Chenhall, (2003) however, suggest an improved research method in contingency based studies to ensure methodological rigor. Mixed method would therefore be a good candidate in future research attempts to get detailed contextual ideas coupled with the survey evidences rooted in triangulation approach.

Nevertheless, it is argued that EU shows evidence of a negative impact on the usage of non - financial measures and organizational performance in the Bangladesh context and setting. Although the results are less consistent with the previous studies, the study presents additional empirical evidence on the moderator role of EU in the relationship between non – financial measures and firm performance. This result advocates that the firms make greater use of non-financial measures with the aim of progressing firm performance given EU is low and there exits flexible type corporate culture.

End notes:

[1] Using the factor scores in the analysis and weighted average scales are the other two regularly utilized methods in management accounting research in which the respondents' scores for each item are multiplied (weighted) by the relevant factor score. It is a matter of debate as to which of these three options is the more suitable, although each has some merits and demerits over the other. This paper details only the results based on un-weighted scores from the factor analysis for both the independent and dependent variables. In effect, weighted factor scores were also employed to test the research hypothesis and no noticeable differences were found.

[2] A copy of the survey is given in the appendix.

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Appendix 1: Questionnaire used for this study.

(I) <u>Environmental uncertainty</u>

The following statements describe some of the factors that are constantly in the process of changing in the external environment. Using the scale below, please indicate for each statement the number that corresponds to the <u>predictability or unpredictability within your business environment</u>. Please note any of the decisions specified in questions l – 8 are not applicable to your business firms enter the term 'N/A' next to the question number.

Items	1 Very predictable	2 Predictable	3 Neither predictable or unpredictable	4 Unpredictable	5 Very unpredictable
1. Suppliers' actions					
2. Customer demands, tastes and preferences					
3. Deregulation and globalization					
4. Market activities of competitors					
5. Production and information technologies					
6. Government regulation and policies					
7. Economic environment					
8. Industrial relations					

(II) <u>Non-financial performance measures:</u>

Please indicate 1 (to a very little extent) to 5 (to a very great extent)on organization's use of the stated measures in performance evaluation.

1 =To a very little extent
2=To a little extent
3=To some extent
4=To a considerable extent
5 =To a very great extent

Items	1	2	3	4	5
1. Material and labor efficiency variance					
2. Process improvements and reengineering					
3. New product introduction					
4. Staff development and training					
5. Customer satisfaction survey					
6. On-time-delivery					
7. Long-term relations with suppliers					
8.Workplace relations					
9. Employee health and safety					
10. Market share					
11.Warranty repair costs					
12. Customer response time					
13. Employee satisfaction					

(III) <u>Organizational performance:</u>

Please indicate on a five-point scale ranging from 1 (Well below average) to 5 (Well above average), your organization's performance along the following items during last 3 years.

Items	1 Well below average	2 Below average	3 Average	4 Above average	5 Well above average
1. Operating profits					
2. ROI					
3. Sales growth rate					
4. Market share					
5. Cash flow from operation					
6. New product development					
7. Market development					
8. R&D					
9. Cost reduction programs					
10. Personnel development					
11. Workplace relations					
12. Employee health and safety					

Corporate culture:

(IV). Please indicate below, by circling the appropriate number, to what extent does your company emphasize the following cultural values (1= To a very little extent; 5=To a very great extent):

1 =To a very little extent
2=To a little extent
3=To some extent
4=To a considerable extent
5 =To a very great extent

Items	1	2	3	4	5
1. My company is human-oriented; people seem to share a lot of themselves.					
2. The glue that holds my company together is loyalty and tradition.					
3. The head of my company is generally considered to be a mentor, a sage, or a parent figure.					
4. My company emphasises human development; high level of trust and participation persists					
5. Management style in my company is characterised by teamwork, consensus and participation					

Demographic Information:

Please provide following information :

(i) Number of employees **:** Below 100 (ii) 100- 199 (iii) 200- 299 (iv) 300- 399 (v) 400 employees or more

(ii) Please specify the approximate annual sales turnover for your business for the last financial year. Tk. ----------million

(iii) Please specify the amount of capital employed for your business up to the last financial year. Tk. ----------million

Thank you for your time and co-operation