

Competition, business strategy and the adoption of multiple performance measurement system: Some evidence from Bangladesh.

Abstract

This empirical study explores the association between competition, business strategy and the uses of multiple performance measurement system in the context of Bangladesh manufacturing firms. The study uses a questionnaire survey of 148 manufacturing companies in Bangladesh. Data were analysed using statistical factor analysis and other descriptive statistics. The results suggest that greater emphasis on multiple measures for performance evaluation is associated with businesses facing high competition, and that the practices of multiple performance measures are significantly related to types of business strategy being followed. The paper identifies that the designers of performance measurement systems need to consider contingent factors that affect organisations' operations.

Keywords: *Multiple Performance measures, Market competition, Firms' strategy, Bangladesh Manufacturing sector, Bangladesh.*

JEL classification codes: M11, M13, M14, M41

INTRODUCTION

Non – financial based performance measures such as customer satisfaction, on time delivery, employee satisfaction and competence and so on are viewed as essential vehicles for gaining competitive advantage with the rise of stern competition in today’s technology-driven international economy. The academics and practitioners urge an increasing insistence for better customer service, superior workforce, and excellence in manufacturing operations. As a result, the adoption of measures to capture these qualitative dimensions, commonly known as non-financial measures in the academic circle (see for example, Kaplan and Norton, 1992; Horngren et al., 2009) has become a necessity for firms trying to succeed in a fiercely competitive market. The shortcomings of financial performance measures were echoed for long time by the academics and the practitioners (see for example, Lynch and Cross, 1991; Kaplan and Norton, 1992, 1993 and 1996; Ittner and Larcker, 1998; Otley, 1999; Banker *et al.*, 2000; Hoque and James, 2000) due to its historic nature, lack of strategic focus and lack of innovative outlook (see Ishtiaque et al., 2007; Bourne et al. 2000; Schoenfeld, 1986; Dearden, 1987; Emmanuel and Otley, 1995; Kaplan and Norton, 1996a, Abernethy and Lillis, 1995; Chenhall, 1997; Perera *et al.*, 1997; Ittner *et al.*, 1997; Ittner and Larcker, 1998 for reviews).

In order to overcome the shortcomings of the traditional financial performance measures and to devise a measurement system incorporating all dimensions of the value chains of a business, academics and practitioners endeavored to use a comprehensive performance measurement system. The rationale for the adoption of a single comprehensive performance measurement system is that multiple performance measures are assumed to offer continuous indications to key decision makers with regard to what is most indispensable for the day-to-day operations and where efforts must be headed for. This rationale is endorsed by researchers pursuing research in performance measurement systems (see for example, Hoque and James, 2000; Ittner and Larcker, 1998 and Otley, 1999 for reviews).

The use of multiple performance measures has many benefits. The inventors of Balanced Scorecard (BSC), Kaplan and Norton (1992, 1996), posited that the use of multiple performance measurement system promotes a balance between outcome measure (the results from past efforts) and the measures that will drive future performance. However, earlier research studies (e.g. Govindarajan and Gupta, 1985; Ittner et al., 1997; Simons, 1987) reveal the role of the contextual variables, which might have influences on the use, and effectiveness of performance evaluation systems in organisations. Previous research attempt (e.g Hoque, 2004; Houque et al., 2001) documented that

how the different contextual variables such as firm size, strategic priority, and market competition, computerized manufacturing system etc. influence the use of multiple performance measures or adoption of BSC in different international settings. For example, in his studies on 52 New Zealand Manufacturing firms, Hoque (2004) found a significant and positive association between strategy and management's use of non-financial measures for performance evaluation although he did not find positive relationship between environmental uncertainty and organisational performance through use of non-financial performance measures. In another research study on 71 New Zealand based manufacturing unit, Hoque et al (2001) found that greater emphasis on multiple measures for performance evaluation is associated with businesses facing high competition and making greater use of computer-aided manufacturing processes.

However, not any research exertion seems to have made in the context of Bangladeshi Manufacturing sector which explored the presence of any association between the uses of multiple performance measure with such contextual variables such as market competition, and firms' strategy. More specially, not any research initiative has been taken out to observe the role of contingency variables and use multiple performance measures by Bangladeshi Manufacturing firms.

Bangladeshi manufacturing sector is an interesting area to study for few reasons. First, the evidence on the correlates of multiples performance measures with contingent variables in low-income countries is rare. Many management accounting and performance measurement researchers (see for example, Chenhall, 1997; Chenhall and Langfield-Smith, 1998; Ittner and Larcker, 1998) advocated that contingent variables such as managerial and technological factors, market competition and environmental factors are significant in understanding performance measurement systems that the firms search for. Taking the existing performance measurement literatures as a steer, this study is designed to explore the management factors and market forces contributing to the adoption of multiple performance measures in the developing counties' setting. Second, the manufacturing sector in Bangladesh is essentially dynamic, having experienced very strong growth in total value-added and exports since the 1990's liberalizations, largely driven by the ready-made garments industry. This is because since 2000, manufacturing exports represent more than 90% of total exports in Bangladesh (Fernandes, 2008). In addition, this sector recorded an impressive seven percent average annual growth over the 1991-2006 periods, increasing its share in GDP from 13 percent to 16 percent, compared to just five percent average growth in the 1980s. Bangladesh was chosen following calls by Ittner and Larcker (2001) and Chenhall (2003) that research relevance should be hunted by exploring new management accounting approaches in a variety of contemporary settings. Bangladesh has been described as a role model of a successful transition from a socialist to a market

economy (Rahman et al, 2005) and has been successful in converting the merit of economic stabilisation and reforms into sustained and accelerated growth. Its progress is also positive from the fact that Bangladesh's per capita GDP has been rising in recent years. Third, owing to better diversity and complication in several areas for instance, product market, industrial process, and cost composition (mainly overhead cost), manufacturing companies of Bangladesh need to put greater concern on their performance measurement systems. Fourth, Begum *et al.* (2001) addressed that the ongoing process of gathering multiple information on broad base dimensions of performance are considered to be important by the organization for the purposes of monitoring the firms' standing with respect to these dimensions and effectiveness of adopting innovative management tools. Fifth, Ishtiaque *et al.* (2007) viewed that modern manufacturing industries have undergone massive technological changes and most local as well as foreign organisations have become larger and more multifaceted. Consequently, the use of sophisticated technologies and technology driven production processes have led to a new demand on companies' control systems which made it inevitable to adopt multiple performance measurement practices. These tended to serve as the basis for steady improvement and designing a balanced measurement system. And lastly, in recent years, initiatives with regard to the use of some non- financial measures in performance evaluation in manufacturing sector of Bangladesh are noticeable as revealed in recent research studies (for example, Mosarraf and Ahmed, 2008; Hossain, 2007). Therefore the current study is an endeavour to empirically study the relationships among organisations' market competition, types of strategy organisations adopted and multiple performance measurement practices.

This study uses a contingency-based approach, which has been widely applied to both strategic research and management accounting research (Chenhall, 2003; Donaldson, 2001). Moreover, the contingency approach is the only one approach which states that organisational performance depends on the existence of a fit between the characteristics of an organisation and the situation in which it operates (Donaldson, 2001; Gerdin and Greve, 2004). The study is based on a sample of 50 Bangladesh business units in the manufacturing industry listed in the Dhaka Stock Exchange. To our knowledge, this study is the first of its kind to provide evidence on the contingency factors affecting the adoption of the multiple performance measures for firms in the manufacturing industries in a developing country context, and to document a specific association between multiple performance measures and, market competition, business strategy using the Miles and Snow's (1978) typology.

The remainder of the paper is organised in the following sequences. Subsequent to a short review of Bangladesh manufacturing sector and performance measures, the next section describes prior

literature followed by developing the research hypotheses. The paper then outlines the research methodology used in this study. The empirical results appear in the last section followed by discussion of the results along with concluding remarks and the limitation of the study.

1. MANUFACTURING SECTOR IN BANGLADESH AND PERFORMANCE MEASURES

Bangladesh, globally known primarily for its over population, is a country positioned in South Asia with a per capita Gross National Income of only \$440 per year (World Bank, 2005). Although the agricultural sector dominates the Bangladesh economy, the contribution of the industrial sector to Bangladesh economy has now seen an increasing trend, essentially propelled by the readymade garments and knitwear industry. The manufacturing sector in Bangladesh comprises mainly small, privately owned, non-mechanized enterprises or large state-owned, often loss-making enterprises. The 2006-07 report revealed that there were 29,573 manufacturing units in Bangladesh; out of these 22,708 units were individually owned, 5,612 units were private limited companies, and 446 were public limited companies. In 2006-07, the contribution of the industry sector to real GDP is 29.77 percent while it was 17.31 percent compared to 1980-81. It is likely that this rising growth tendency of the industrial sector will assist to achieve the national growth rate at seven per cent level and the country's aspiration to attain Millennium Development Goal by 2015. To further reinforce the process of industrialization, the government has recognised the Small and Medium Enterprise (SME) sector as a priority sector and to attract foreign investment. All infrastructure to be provided to the potential investors were incorporated in the most recent Industrial Policy announced in 2005. However, all the firms in the industry are not traded in the stock market, in particular readymade garments (RMG) sector. Bangladesh's main competitive additional advantage over its competitors is the unique low wages rate (around 30-40% less than the major competitors such as India and China respectively) and its cheap, reliable, and abundant labor is attractive to the world's leading transnational corporations (Khundker and Nasreen, 2002).

With growing global competition and rapid transformation, manufacturing industry have to offer superior product differentiation and value added services, gaining customer satisfaction, and attaining process upgrading more and more in order to be competitive and yield a fair financial return (Arif et al., 2005). Recognising the urgency of promoting customer services, excelling business process, Bangladesh Government has also started to encourage, as documented in the present industrial policy (2005), the improvement in ICT in manufacturing by adding "...in this age of ICT, it is possible to provide accurate and rapid customer services by using ICT for cost

effectiveness and improvement of the quality of products. This is why, provides encouragement to the intensive use of ICT on certain specific areas”. (p.23)

While in earlier research studies (Mozumder, 2007; Sharkar et al, 2006) reveal Bangladesh evidence on management accounting systems dominated by traditional cost accounting practices. Further studies (e.g. Ishtiaque *et al* 2007; Mosarraf and Ahmed, 2008; Hossain, 2007) demonstrated the use of contemporary performance measurement tool by the manufacturing sectors at least on a smaller scale. In their study on a leading MNC in Bangladesh, Ishtiaque *et al* (2007) revealed that companies perceive each perspective of BSC reasonably and followed related KPIs for the entire organisation for rating business performance. Mosarraf and Ahmed (2008) in their research attempt on 10 (Ten) pharmaceutical companies found that they predominantly follow financial measures with some non- financial measures, emphasising such factors as human resources efficiency, employees performance and satisfaction, Research and Development, and time taken for new product launching. However, they trust the importance of non-financial measures for evaluating of business performance. In another recent research study by Hossain (2007) on a leading mobile phone company operating in Bangladesh, it is found that the company relies both on financial as well as non – financial measures. But to date, no attempt has been made to examine the role of contextual variables on the use of multiple performance measures widely acclaimed in the performance measurement literature. Thus this study is likely to minimize the dearth of this research gap in the context of a developing nation such as Bangladesh.

2. LITERATURE REVIEW AND THE HYPOTHESES DEVELOPMENT

3.1 *Multiple Performance Measures Usage*

Performance Management literature is replete with discussions about the inadequacy of accounting-number based historical performance measurement (for review see, Ittner and Larcker, 1998; Chenhall, 1997; Dixon *et al.*, 1990; Keegan *et al.*, 1989; Lynch & Cross, 1991; McNair and Mosconi, 1987). Kaplan and Norton, (1992, 1996) posited that the multiple performance measures may well be functioning to reflect firms’ performance in all dimensions of its operations. In fact, the vehicle of the non- financial measurements has necessarily been initiated after the 1990s with the advent of a popular performance measurement tool – Balanced Scorecard (BSC). The architect of BSC model -Kaplan and Norton (1992, 1993) designed this new performance measurement tool combining both financial and non-financial measures, which is believed to assist business enterprises to measure their performance in a more balanced manner. Recent management accounting literature and academic researchers stressed that performance measurement based

merely on financial measures are no longer useful since they are historic in nature, lacking strategic focus and does not have the innovative outlook (see Bourne et al. 2000; Schoenfeld, 1986; Dearden, 1987; Emmanuel and Otley, 1995; Kaplan and Norton, 1996a, Ishtiaque et al, 2007 for reviews). Thus the adoption and use of innovative performance measurement tool, incorporating both financial and non-financial measures is indispensable. Kaplan and Norton (1996) suggest multiple measures to include a combination of the following multidimensional performance measures.

Financial perspective – The main aim of financial perspective is to oversee proper utilisation of shareholders investment. According to Jusoh et al. (2008) it provides the ultimate outcome or bottom-line improvement of the organisation where it measures the economic consequences of actions already taken in the learning and growth, internal business process, and customer perspectives. However, financial measures usually narrate the firms’ profitability such as operating income, return-on-investment and economic value-added (EVA), sales growth, cost control, and cash flow. Financial consequences of a firm are viewed as the ‘fruits’ of the trees and thought of as a lagging indicator (Kim-Langfield, Thorne and Hilton, 2006)..

Customer perspective – Customer perspective envelops a firm’s capability to provide quality products and services, the effectiveness of its delivery, and attaining overall customer service and satisfaction. This perspective assists an organisation to look after its internal business processes for customer satisfaction with a view to progress towards financial outcomes. Under this perspective, notable measures are customer satisfaction, customer response time, market share, and on time delivery.

Internal business process perspective – Internal business process perspective focus on the internal processes (departments or process) that the organisation must excel to gain customer satisfaction and make financial returns to shareholders. This perspective is as comparable as the ‘stem’ of the ‘trees’. Kaplan and Norton (1992) noted, “(a) failure to convert operational performance, as measured in the scorecard, into improved financial performance, should send executives back to their drawing boards to rethink the company’s strategy or its implementation plans”. The main performance measures under this perspective may include manufacturing efficiency, quality, defect rate, and cycle time.

Learning and growth perspective – Learning and growth perspective takes into account how an organisation learns and makes a change and improvement so that long-term value formation can be

recognised (Jusoh *et al.*, 2008). It mainly focuses on the competences of people (employees), systems and procedures applied in attaining advance performance in internal processes, making customers satisfied and eventually bulking up the financial performance. This perspective measures such things as training and development, employee satisfaction, employee retention, and employee productivity. This perspective is considered as comparable as the “roots” of the ‘trees’.

Hoque (2000) advocated that the use of multiple performance measures might motivate breakthrough improvements in critical activity areas such as products, processes, customers, and market developments. Kaplan and Norton (1996) suggest that while traditional financial measures report on what happened last period without indicating how managers can improve performance in the next, a multidimensional approach to performance evaluation functions as the cornerstone of a company’s current and future success. Several other writers share this view (e.g. Atkinson *et al.*, 1997; Dixon *et al.*, 1990; Lynch and Cross, 1991; Nanni *et al.*, 1992; Shields, 1997; Simons, 1995, 2000). Hemmer (1996) reports how non-financial performance measures can be best combined with financial measures to obtain the best measurement of performance in a competitive situation (See also Kaplan and Atkinson, 1998; Shields, 1997; Hoque and James, 2000). The relations among competition, computer-aided manufacturing and use of multiple performance measures are discussed in turn.

3.2 Market Competition

It has now been an established reality that to compete in the universal field, firms must put an increased interest to improve products and processes on a continuous basis (for review of this literature, see Mosarraf and Ahmed, 2008; Lynch and Cross, 1991; Kaplan and Norton, 1996a; 1996b). With the improvements of activities, firms attain benefits either in the form of augmenting companies value cum shareholders wealth (Hoque, 2004) or entering into the new markets (Ishtiaque *et al* 2007; Hoque, 2004), which is believed to capitulate positive impact on company’s financial results as well as escalating value for customers and superior operating efficiencies. Lambert (1998) argues that customer-purchasing behavior is influenced by characteristics of the economic environment such as the level of competition. McNair and Mosconi (1987) advocate that a performance measurement system within a firm ought to scrutinize changes in market demands to make sure and review progress toward business objectives and ensure accomplishment of performance goals. Furthermore, to attain competitive advantage, the organisational requirements to keep an eye on different series of market issues (such as competition for price and market share, marketing and product competition, competitors’ numbers, actions of competitors), there must be a measurement system that entails both financial and non-financial facets of performance. However,

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

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

integration (or balance) between financial and non-financial measures in the performance measurement system is believed to be indispensable for the firm's long-term triumph in today's competitive environment. Moreover the use of multiple measures of performance can at the same time be designed to fulfill the owner's most pressing concerns and keep the operating company protected from the consequences of irrepressible events in the marketplace (Kaplan and Norton, 1996; Mia and Clarke, 1999).

In Bangladesh, the manufacturing sector, particularly, textile and clothing, readymade garments (RMG), well-established foods processing sector and pharmaceutical sector have been experiencing a lot of attention in the context of access to international exports and in contributing to the substantial and robust economic growth in recent times. Bangladesh was capable of gaining a strong foothold in a quota-driven global apparel market over the past years. As a result, the rapid growth in apparel sector had been experienced during the last two decades. However, with the rise of free trade and elimination of the quota system at the end of 2004, Bangladeshi firms face extremely acute competition from other Asian countries such as China, India, Indonesia and Thailand. According to Rahman and Anwar (2006), distortions in the global apparels market in the form of entry restrictions and quota premiums were to be replaced by competition and competitive prices (p.3). On the other hand, Pharmaceutical sector is a very technology intensive and far more innovative in terms of new product/process innovations when compared to low technology sectors such as textiles and agro-processing (Gehl, 2007). In Bangladesh, adoption of a number of macro economic measures such as the policy of economic liberalization, structural adjustment and privatization facilitated to increase the competitiveness of local industries and encouraged them to search for new overseas markets. In order to promote the attractiveness of the Bangladesh economy, the government established special export-processing zones (EPZ) where foreign investors are given access to well-developed infrastructure and enjoy tax breaks and other privileges. Firms operating in EPZ together with the strong presence of MNCs have underpinned more competitive estate for the local manufacturing firms. Furthermore, many domestic firms, which have long enjoyed tariff protection, are at present finding it difficult to adjust to the changed competitive situation resulting from the reduction/removal of tariff and other non-tariff barriers. These changes in policies have added to the misery of these firms who have been subjected to increased competition with both domestic and foreign firms. Consequently, local firms have tended to play a key role in production efficiency, excelling in product quality and retaining customers by fulfilling their demands on time. In such circumstances, there is an urgency to use multiple performance

measures to support these firms' agendas to survive, and possibility grow in a fiercely competitive market environment.

Thus it is well understood that the preceding discussion provides the basis for our first hypothesis in relation to the relationship between multiple performance measures and market competition.

H1. A firm facing an intense market competition is likely to make greater use of multiple measures than just financial measures of performance.

3.3 Business strategy

Many researchers opined in the performance management literature that accounting control systems should be planned in line with the business strategy of the firm (for review, see Langfield-Smith 1997; Dent 1990; Simons 1987; Otley 1980). While the importance of business strategy as a contingency variable has been explored for other management control systems (Zahra, and Pearce, 1990; Govindarajan and Fisher, 1990; Simons, 1987; Gosselin, 1987) it has yet to be examined with the uses multiple performance measures. The performance measurement literature suggests that, although a performance measurement system is essential in all companies, different manufacturing environments demand different sorts of measures to assess organisational effectiveness (Abernethy and Lillis, 1995; Bruggeman and Slagmulder, 1995; Duncan, 1972; Khandwalla, 1972; Mia and Chenhall, 1994). Several management accounting studies (see, for example, Kaplan, 1990; Meyer, 1994; Nanni *et al.*, 1992) stress that performance measurement system should be planned to straightforwardly support the strategic preference of a company. Lynch & Cross (1992) endorsed a performance measurement hierarchy that elucidate an integrated performance measurement system, from senior management level to the operational level, which addresses both market and cost considerations headed for supporting aspects of strategic importance. Smith (1997) described that performance measures are believed to be essential in all circumstances, regardless of what strategy is pursued. The related literature advocated that organisations use types of measures that fit with their strategy, their organisational structure and the environmental uncertainty that they face. The type of strategy employed by a firm should influence the design of the performance measurement system. In examining the business strategy contingency variable, the current study utilizes Miles and Snow's ¹ (1994,1978) four strategic types of firms, which, they identified in accordance with the rate at which they change their products and markets: defenders, prospectors, analyzers and reactors ². *Defenders* operate within a narrow product-market domain characterized by high production volume and low product diversity, compete aggressively on price, quality and customer

service. They engage in little or no product/ market development and stress efficiency of operations. *Prospectors* are companies that almost frequently search for market opportunities and repeatedly experiment with potential responses to emerging environmental trends. Prospectors compete through new products and market development. Product lines change over time and this type of company constantly seeks new market opportunities. *Analyzers* situate between these two categories, sharing characteristics of both prospectors and defenders as they operate in two types of product-market domains, one relatively stable, the other changing. Reactors do not follow a conscious strategy. They are viewed as a dysfunctional organisational type. According to Miles and Snow (1978), these companies lack a consistent strategy-structure relationship and therefore seldom make adjustments of any sort until environmental pressures force them to do so.

In Bangladesh, it has been observed since the liberation of the country, that organisations operate in uncertain environments. So they need a broader range of financial and non -financial information with a view to assist strategic decision making. In this vein, Mosarraf and Ahmed (2008) mentioned that firms pursuing a quality, customer strategies are more effective in using a broader range of performance information such as internal and external, financial and non-financial and past and future oriented. In such circumstances, there is considerable possibility for the manufacturing sector to lead the growth process for quite some time. Manufacturing organizations, in particular, pharmaceutical sector now respond to rising customer demands of quality, flexibility and reliability of supply through the investment and implementation of superior manufacturing technology to ensure healthy growth. So it follows that, to unleash the full potential of the sector and in order to attain greater diversification, it would be significant that type of strategies the managers follow be integrated greatly with measures that reflect market potentials and performance.

In view of the ideas derived from the above-mentioned discussion, the standing at this point is that the selection (or type) of multiple measures for performance evaluation is determined by the organisations' selection with regards to the strategy being followed. Therefore this study suggests that the use of the multiple performance measures is more likely to benefit firms following a Prospector or Analyzer strategy, and less likely to benefit firms following a Defender strategy. The greater the difficulty that a business unit faces, the greater the vagueness it confronts. Since *prospectors* search persistently for market opportunities and have a broad product-market domain, they will be likely to adapt their performance measurement systems to their strategy and, therefore, focus on non-financial measures pertaining to customers, products, employees and quality.

Defenders will have an inclination for weighting more on financial measures such as variances. Therefore, the second hypothesis of the study is posited as follows:

H2. Uses of multiple performance measures is associated with the types of business strategies followed within the organisation

3. RESEARCH DESIGN

The methodologies adopted for confirming or refuting the research hypotheses involve collection of both primary and secondary sources of data. Primary data were collected by way of questionnaire survey method. The draft questionnaires, based on the review of literatures, were developed and circulated to a group of prominent academics, management accounting consultants and chief accountants and finance officers (CAFOs) for feedback as part of the pilot study. Based on their suggestions, the questionnaires were revised. The questionnaires ³ (along with the instructions sheet) were mailed to the chief executive officers of 148 Bangladeshi's manufacturing companies ⁴ selected from the Dhaka Stock Exchange's (DSE) official register of Listed Companies. The official web addresses of all sample firms were collected from the "companies profile section" maintained by DSE. The manufacturing industry is viewed as an appropriate area of study as manufacturing firms are considered highly competitive and might have more aptitude to explore new market domain continuously. Moreover, manufacturing industry is an important engine of growth to Bangladesh's GDP (Gross Domestic Products) as this sector contributes 29.77 percent of GDP at constant prices for FY 2006-07 (Bangladesh Economic review, 2007). Consistent with earlier studies, mail survey was adopted since it helps the collecting of information from a broad cross-section of firms fairly at a low cost (Chenhall, 2003; Gosselin, 1997; Shields, 1995). Questionnaires with a cover letter and a postage-paid, self-addressed envelope were mailed during the week from January 30, 2008, to February 10, 2008. Two reminders were also sent (one at the end of February, 2008 and the second in March, 2008) for follow-up in order to get the most out of the response rate. Surveys are burdened with problems linked to measurement errors and biases, problems that may be aggravated when the survey is written in the respondents' second language. (The concern of language is, conceivably, less important in the Bangladeshi perspective where fluency in English is very common, especially among top managers due to their high academic background and professional attainment.) An assertion was given to the CAFOs that the identity of the respondent companies and the respondents would be kept strictly confidential and only aggregate generalizations would be published. Ninety eight (98) of the one hundred forty eight (148) respondents failed to complete the questionnaire, mentioning such grounds as contravening to company's policy, staffing limitation and not relevant. As a result, a total of fifty (50) completed

questionnaires from different firms shown in Table 1 representing a response rate of 33.78 %, were used for analysis of the results. This response rate is as low as compared to Hoque's (2001) response rate of 59.2%. The relevant statistics of respondent companies in terms of employees, annual sales and assets are attached in the appendix. To detect the non-response bias and likely response bias owing to early and late responses, the study employs t-test, results of which suggests no significant differences between the respondents and non-respondents in terms of size and varied sectors.

<Insert Table 1: Sample size and respondent types>

3.1 VARIABLES MEASUREMENT:

3.1.1 Multiple performance measures usage.

To evaluate multiple performance measures usage, the study employs the forty items (Ten relates to financial and others non-financial) comprising the four dimensions, which is in harmony with the Kaplan and Norton's (1992) Balanced Scorecard approach. Each element of the performance measures consists of multiple items in relation to performance measures (as presented in Table 2) are found in the academic literature and a small number of questions were self-constructed. They were contribution margin, company's cost per employees, economic value added (EVA), number of new customers, unit product cost, R and D cost, human resources development cost, and total training hours for employees. According to Kaplan and Norton (1992) these specific items clearly integrate the underlying strategy of a company (see also Kaplan and Norton, 1996). The respondents were asked to indicate, on a five-point Likert-type scale ranging from one (not at all) to five (to a great extent), the extent of their organisation's use of each indicator across the four perspectives for assessing business unit performance. Descriptive statistics (mean, standard deviation) for each performance indicator are presented in Table 2. A principal components analysis (PCA) with varimax rotation was performed for those measures to determine their dimensionality among groups. However, prior to performing PCA, the suitability of data for factor analysis was assessed dully. A close examination 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 = 767.95, $p < .01$) and the Kaiser- Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.88, exceeding the recommended value of 0.60 (Kaiser, 1974). These results suggest that the factorability of the data is considered appropriate and results also indicate that factor analysis for each performance dimension shows that the items of the each

dimension are unidimensional as they loaded adequately on a single factor. Table 3 presents the factor loadings (after varimax orthogonal rotation), the percentage of variance explained by each factor, and the Cronbach alpha (Cronbach, 1951). To facilitate the analysis, an average score of the means of the four dimensions was computed. However, to have a better understanding of the issue, each factor (dimension) was also used individually in the analysis.

<Insert Table 2: Descriptive statistics for the multiple performance measurement items (N= 50)>

<Insert table 3: Results of factor analysis for performance measurement dimensions (N=50)>

3.1.2 Intensity of market competition.

Several models in measuring intensity of market competition are accessible in the literature (see for example, Khandwalla 1972; Gordon and Naryanan, 1984; Hoque and Hopper, 1997; Houque et al, 2001; Libby and Waterhouse, 1996; Merchant, 1984). Some researchers extended the Khandwalla (1972) model by incorporating other competition factors such as new entrants in the market, competitors' strategies and actions, number of competitors, and the strength of a company's market position (see also Cooper, 1995). Based on these studies, Houque *et al.*, (2001) conceptualised the intensity of market competition under six different areas such as price, new product development, marketing or distribution channels, market (revenue) share, competitors' actions, and number of competitors in the market. The current study adapted the competition factors used by Hoque *et al.* (2001). For the purpose of this research, the intensity of market competition is the degree of competition confronted by a business unit on each of the above six factors. Moreover, this instrument is also believed as significant and relevant to the market competition firms' confront opined by the respondents in taking part in the pilot study. Respondents in the main study were asked to indicate, on a five-point Likert-type scale ranging from one (not at all) to five (to a very great extent), the intensity of their business unit's market competition with respect to the above competition factors. A factor analysis of the scores for the items extracted a single factor with EigenValue greater than 1.0. The overall score for the intensity of market competition was computed by adding the executives' scores for each item in the measure.

<Insert Table 4: Results of factor analysis for the intensity of market competition items (N= 50)>

Table 4 presents the factor loadings, Eigen value and the percentage of the variance explained. The Cronbach alpha for the measure in the study was 0.85, indicating an acceptable internal consistency and reliability of the measure.

3.1.3 Business Strategy

A range of research studies accentuates the measurement instruments of organisational strategy to confirm the impact of strategy on organisational control and measurement issues empirically. Following previous studies (e.g., Abernethy and Guthrie, 1994; Chong and Chong, 1997; Ittner *et al.*, 1997; Hoque *et al.*, 2001), this study measured strategy in relation to the two extreme strategic position (i.e., prospectors and defenders) of the Miles and Snow (1978) typology. For being better conversant, respondents were provided short descriptions of these strategic priorities. They were inquired to specify the degree of importance that their firms had given to the above strategic priorities over the last 3 years on a five-point Likert-type scale from 1 (defender strategy) to 5 (prospector strategy)⁵. Thus, these methods appraise the organisation's competitive strategy, with superior scores symbolizing firms that are closer to the prospector end of the strategy continuum. Following the studies by Golden (1992) and Abernethy and Brownell (1999), the respondents were also asked to indicate the degree of priority on the types of strategy that their firms had given over the last three years on a five-point scaled anchored from "1" (defender strategy) to "5" (prospector strategy)⁵. This allows the organisational strategy to be represented as continuous variables. Thus this method appraises organisations' competitive strategy with high scores of the scale indicating a prospective strategy and low scores indicating a defender strategy. We use this strategic typology as a contingency in the adaptation of business strategy practices because it has been demonstrated to have external validity in several research settings. The mean score for the construct is 4.34 and the standard deviation is 0.44.

4. RESULTS

4.1 Descriptive statistics and the correlation matrix

Descriptive statistics and correlation matrix for all variables are exhibited in Table 5 and Table 6 respectively. All the Cronbach alpha coefficients exceeded the lower limit of acceptability, which is usually considered to be 0.70 (Nunnally, 1978). As can be found in Table 6, consistent with our expectation, the overall use of multiple measures of performance is positively and significantly correlated with the force of market competition ($r = 0.57, p=0.000$) and the business unit strategy ($r = 0.69, p=0.000$). Both the business unit strategy and intensity of market competition are positively and significantly associated with all of the four performance dimensions evidenced in Table 6. In addition, result shows that the contextual variables, business strategy and market competition, are positively and significantly related to each other, implying possible multicollinearity problems. To test for the presence of multicollinearity, tolerance and variance inflation factors (VIF) were also used. When the tolerance is low or close to zero, the multiple correlations are high and the

likelihood of multicollinearity is increased. The variance inflation factor (VIF), which is very much related to the tolerance, is seen as the reciprocal of the tolerance. As the VIF increases, so does the variance of the regression coefficient. VIF greater than 10 (ten) is often taken as a sign that multicollinearity may be a problem. The results (shown in table 7) indicate the high tolerances ranging from 0.911 to 0.978 and low VIF's ranging from 1.45 to 1.96 for the independent variables in the regression model. However, after examining tolerance and variation inflation factor (VIF) tests, none of these tests detected multi-collinearity among the variables (VIF, 10, 16). Thus, it indicates no major problem for regression analysis. Furthermore, tests of nonlinearity and heteroscedasticity of the data indicated no major problem for regression analysis. As shown in Table 7 and Table 8, none of these tests detect multicollenearity among the contextual variables, thereby indicative of no major problem for regression analysis.

<Insert TABLE 5: Descriptive statistics>

<Insert Table 6: Pearson Correlations (n= 50)>

Hypothesis Testing

To test the hypotheses, the regression model was run using the SPSS 14.0 program with the help of following regression equation:

$$Y = b_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where **Y** = performance measures usage (Dependent variable)

X₁ = Market Competition;

X₂=Types of strategy followed; **X₃**= firm's size (logarithm of sales revenues of *ith* firm);

b₀ = the intercept; and **e** = the error term and **b₁, b₂, b₃** = the regression coefficients for the two contingent variables. Consistent with the Hoque *et al.* (2000) organisation size is added to the model to control for the opportunity that multiple performance measures usage may differ with business unit size (sales revenue being a proxy for business unit size).

<Insert Table 7 (a): Regression results>

<Insert Table 7(b): Regression results>

The results presented in Table 7 (a) indicate that the coefficients **b₁** (intensity of market competition) and **b₂** (types of strategy followed) are both positive and significant (**b₁**=0.497, *t*=4.995, *p*=0.000; **b₂**=0.194, *t*=1.783, *p*=0.025). Thus these results provide sufficient testimony to support the study's first proposition that greater multiple performance measures usage is associated

with increasing intensity of market competition and types of strategies followed by business units. This is also evident from the above table that firm's size appears not to be significantly associated with multiple performance measures usage. The whole model is significant ($F = 16.531$; $p = 0.000$) and explains 53.08 per cent (as shown in Table 7b) of the performance variance.

4.2 Supporting Regression Analysis

The analysis conducted up to this point, focuses on linkage of all perspectives of the multiple measures with two contingent variables. The question now is whether each performance measure uses have the same effects on firm contingent variables compared to those of the overall multiple performance measures. To deal with this question and to further investigate the relationship predicted in the regression model, the analysis was also performed using each of the four performance dimensions. The results are presented in Table 8, which indicate that both types of strategies are followed and the intensity of market competition are associated significantly with each of the performance dimensions. Again, business unit size appears not to be an important predictor of a performance measurement system usage. Overall, the results for the financial, innovation and learning, Internal business process and Customer perspective (Panel E) explain 29.9 %, 34.5%, and 43.7% and 36.4 % of the variances respectively.

<Insert TABLE 8: Supporting Regression Analysis>

To add further insightful appeal with respect to observing the association between multiple performance measures and uses of business strategy (i.e., if businesses pursue a prospector strategy, will be they be more inclined to use multiple performance measures?), we examined the relationship using a two-way ANOVA. To do it, Strategy was split on the basis of the median scores to create two groups: Prospector Strategy (above median) and Defender Strategy (below median). Multiple performance measures usage was also split at the median level to create two groups: Multiple performance measures (above median) and Traditional performance measures (below median)⁷. The mean scores for multiple performances measures shown in Table 9 indicate that firms pursuing prospector strategy have a propensity to rely on multiple performance measures to rate business performance than the firms pursuing defender strategy. In other words, it highlighted that if firms practice a prospector strategy, then they will be more inclined to use multiple performance measures than firms pursuing defender strategy. Table 9 also shows that multiple measures usage rate is lowest when it fits with defender strategy (mismatch). The results of the F-test suggest significant variations [as derived probability (p) < significant level (0.01)] between these two groups of firms in terms of their use of multidimensional performance measures.

Consequently, it can be stated that firms following a prospector strategy are more inclined to use multiple performance measures. This is consistent with Bouwens and Abernethy (2000) and Abernethy and Lillis (1995), who argued that prospector strategies need sophisticated management accounting systems and integrated measurement tools so as to meet the uncertainty and market demand. Simons (1987) also finds that Prospector firms seem to place more emphasis on forecast and broad ranges of data (financial and non- financial) in control systems.

<Insert TABLE 9: ANOVA Results: Mean Performance Scores>

5. DISCUSSION AND CONCLUSIONS

This paper empirically studied 50 Bangladesh business firms in the manufacturing sector to see the effect of market competition and the types of strategy being followed on the use of multiple measures of performance. Results suggest that a positive and significant relationship between the intensity of market competition and use of multiple measures for performance evaluation. In other words, it reveals, business enterprises operating in Bangladesh rely on the use of complete measure of performance because these firms operate in an extremely competitive atmosphere. Thus these results are in agreement with earlier contingency research on the effect of competition on management accounting practice (e.g., Hoque *et al.*, 2001; Babad and Balachandran, 1996; Ezzamel, 1990; Simons, 1990, 1991; Govindarajan, 1984; Hemmer, 1996; Libby and Waterhouse, 1996; Khandwalla, 1972; Merchant, 1984). The study also reveals that the use of multiple performance measures is positively and significantly associated with the organisational choice regarding types of strategy being followed. In other words, the business strategy might be perceived as a key predecessor of firms' adoption of multiple measures (financial and non- financial). This evidence is much consistent with prior research (see for example, Hoque, 2004; Govindarajan and Gupta, 1985; Ittner *et al.*, 1997; Lynch and Cross, 1991; Simons, 1987, 1995 Kaplan, 1983; Perera *et al.*, 1997) that a congruent (good fit) matching of strategic priorities and the choice of performance measures in performance evaluation is indispensable to enhance organisational performance. However, we do not find the decision to adopt the multiple performance measures to be related to the size of firms.

To further view this relationship, an effort was taken out to analyse in details, for each of the four performance dimensions independently. The results of such kind of efforts (Table 8) indicate that all of the four performance dimensions are important for today's competitive environments operated

by adopting diverse strategies. The ANOVA analysis shows support for this cause, since multiple performances measures is highest when a dominant strategy (e.g., prospector) is well matched with a dominant multiple measures design (e.g., financial and non- financial). The evidence above is noteworthy from a practical standpoint and well documented by proponents of the broader performance evaluation system (Kaplan and Norton, 1996; Hemmer, 1996; Shields, 1997; Atkinson *et al.*, 1997; Ittner and Larcker, 1998; Hoque and James, 2000; Otley, 1999) who campaign in support of enhancing performance evaluation the system by adding a wide variety of relevant, both financial non-financial, performance indicators into the measurement process. Thus in line with what our empirical data unerringly signal with respect to unexplored area in the Bangladeshi manufacturing context, this offers an important contribution to our understanding of the issue in the developing nation context. Another important practical implication of this study is in the area where the designer of performance measurement systems must put emphasis on such variables while adopting the integrated performance measures that are essential to the accomplishment of firms' effort in relation to the design of control and measurement systems in a developing country context. In addition, by exploring this under researched area, the study has identified the need to emphasise on the use of contingent variables in the design of a performance measurement system with multiple dimensions. Thus, the study is believed to be significant with respect to adding new knowledge to the academic body of research practising contingency theory approach.

Nevertheless, the above results are not free from few limitations. Firstly, the study is confined only to manufacturing firms listed in the Dhaka Stock Exchange. Therefore, generalizing our results to other unlisted manufacturing firms, in particular garments industry, or to non-manufacturing firms are to be done after controlling for the differences in industry types and their attributes. Secondly the small sample size coupled with lower response rate restricts the finding of the study to generalize within the sample. Future research can be undertaken with larger sample size along with maximizing more response rate and apply the same beyond manufacturing sector. Thirdly, the findings of the study might change over time; therefore, a longitudinal study in different settings using 'softer' methodologies (such as case studies) may add more rigour on the issue. Future studies are also imperative by using time-series data as suggested by Ittner and Larckers (1998b), as an alternative to this cross-sectional study in observing the impacts of the contextual variables on the use of multiple measures of firm performance. Future research can extend this study by investigating how and why performance measurement systems change over time (Libby and Waterhouse, 1996). Fourthly, this study considers only two contingent variables, leaving other variables unattended. Thus the examination of how multiple performance measures could be useful

to organisations operating in diverse industries with the application of computerized manufacturing operation, firms investment in intangibles, the product (or organisation) life-cycle, would be the other areas for further research. Future research endeavor may also be directed to discover any connection between single items of 'market competition' and the construction of the performance measurement. Hoque (2004) opined that performance measures might have varied level of competition in each item of competition.

Despite the above limitations, this study is the primary to investigate the relationships between the contextual variables and use of a multiple approach to performance evaluation in the specific context of a transitional economy such as Bangladesh. Although its findings should be observed as opening in this context, it would undeniably endorse some researchers to direct their effort to a further exploration of this area. This is our strong belief that enduring research for exploring the effects of contingent variables in the use of multiple performance measures is crucial to facilitate the understanding in the academic and managerial field for keeping pace with what and how it works globally in different economic environment.

Endnotes

¹ Miles and Snow (1978) proposed a comprehensive, business-level strategic typology interrelating organisational strategy, structure and process. Their typology provides a useful framework for distinguishing distinct firm strategies vis-à-vis the competitive environments in which firms operate.

² The key benefit of the Miles and Snow typology is the strong and steady support for its validity in the literature (e.g. James and Hatten 1995; and Simons 1987; Hambrick 1983; Snow and Hrebiniak 1980), and its conceptual and theoretical implication to the field of strategic management literature (Ghoshal 2003; Hambrick 2003; and Chakravarthy and White 2002).

³ A copy of the survey questionnaire may be obtained from the corresponding author.

⁴ The companies surveyed consists of 8 from cement, 4 companies from ceramic industry, 34 from food and allied, 25 from pharmaceuticals and Chemicals, 23 from engineering, 8 from tannery industry, 39 from textile industry and 8 from paper and printing sector.

⁵ For a use alike, see Hoque et al (2001), Chenhall and Langfield-Smith (1998) and Ittner et al. (1997).

⁶ Tk. (Taka) represents Bangladeshi currency. (100 paisa = One (1) Taka.)

⁷ However, as ANOVA assumes equality of variance between groups, the variance was checked earlier using the Levene test. The significance value of the Levene statistic was 0.159 (higher than 0.05), presenting homogeneity of variance.

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TABLES

Table 1: Sample size and respondent types

Manufacturing firms	Sample size	Sample percentage (%)
Cement and Construction	1	2.00 %
Ceramic	1	2.00
Food and allied	15	30.00
Pharmaceuticals and Chemicals	18	36.00
Engineering	9	18.00
Tennary (leathers)	2	4.00
Textile	3	6.00
Paper and printing	1	2.00
Total (N)	50	100 %

TABLE 2: Descriptive statistics for the multiple performance measurement items (N= 50)

Multiple performance measures	<i>Mean</i>	Standard Deviation
Financial Perspectives		
Gross profit Margin	4.88	0.03
Operating margin	4.96	0.01
Return on assets	4.76	0.08
Current ratio	3.76	1.08
Inventory turnover ratio	4.74	0.10
Cost versus budgets	4.50	0.34
Residual income	3.14	1.28
Contribution margin	3.02	1.56
Daily working Capital	3.41	1.57
Economic Value Added	1.97	1.98
Learning & innovation perspectives		
Human resources development cost	3.54	1.17

Number of new employees	3.25	1.41
Employees performance (sales per employees)	4.54	0.56
Total training hours for employees	4.65	0.45
R &D expansion cost	2.94	1.78
Wastage and scrap rate	3.01	1.73
Sales proportion from new product	2.98	1.69
Company's cost per employees	3.82	1.12
Employees satisfaction	2.97	1.74
Percentage of key stuff turnover	3.10	1.22
Internal Business process perspectives		
Unit of output (per labor hours)	4.54	0.28
Measuring defects units (per million)	4.33	0.34
Quantity of energy consumed	4.13	0.91
Unit of output (per machine hours)	4.60	0.23
Unit product cost	4.80	0.08
No of product line or products	4.01	0.98
Number of Machine hour used	3.98	1.02
Total number of workers injured	3.02	1.56
Rate of incidence of injury	2.23	1.89
Level of absenteeism	2.37	2.73
Time to launch new product and services	3.74	1.52
Customer perspectives		
Number of customer complaints	3.01	1.45
Number of new customers	3.25	1.32
Market share	4.67	0.84
After sales service	3.82	1.02
On time delivery of product/ service	3.16	1.45
Number of customer order received	4.18	0.95
Number of Customer suggestion	2.02	1.68
Customer satisfaction survey	2.95	1.47
Organisation image and brand	2.56	1.54
Here, theoretical range, 1–5; 1, not at all; 5, to a very great extent. N = 50.		

TABLE 3: Results of factor analysis for performance measurement dimensions (N=50)>

Factor	Items	Factor Loading	Eigen value	Percentage of Variance Explained
1	Financial Perspectives	0.87	2.84	67.23
	Gross Profit margin	0.84		
	Operating Margin	0.79		
	Return on assets	0.71		
	Current ratio	0.69		
	Daily working Capital	0.67		
	Inventory turnover ratio	0.65		
	Cost versus budgets	0.64		
	Residual income	0.54		
	Contribution margin	0.56		
	Economic Value Added	0.52		
2	Learning & innovation perspectives		2.96	69.01
	Human resources development cost	0.82		
	Number of new employees	0.76		
	Employees performance (sales per employees)	0.75		
	Total training hours for employees	0.69		
	R &D expansion cost	0.67		
	Wastage and scrap rate	0.54		
	Sales proportion from new product	0.51		
	Company's cost per employees	0.49		
	Employees satisfaction,	0.48		
	Percentage of key stuff turnover	0.45		
3	Internal Business process perspectives			
	Unit of output per labor hours	0.82		
	Measuring defects units (per million)	0.78		
	Quantity of energy consumed	0.73		
	Unit of output per machine hours	0.68		
	Unit product cost	0.64		

4	No of product line or products	0.57	3.12	64.76	
	Number of Machine hour used	0.55			
	Total number of workers injured	0.54			
	Rate of incidence of injury	0.48			
	Level of absenteeism	0.45			
	Time to launch new product and services	0.45			
	Customer perspectives				
	Number of customer complaints	0.88	3.54	71.32	
	Number of new customers	0.79			
	Market share	0.76			
	After sales service	0.64			
	On time delivery of product/ service	0.61			
	Number of customer order received	0.59			
Customer suggestion	0.54				
Customer satisfaction survey	0.51				
Organisation image and brand	0.48				

TABLE 4: Results of factor analysis for the intensity of market competition items (N= 50)

Items	Factor loadings	Factor Loading	Eigen value	Percentage of Variance Explained
	Competition for price	0.76	2.98	67.56
	Competition for new product development	0.71		
	Competition for marketing or distribution channels	0.69		
	Competition for market (revenue) share	0.65		
	Number of competitors in the industry	0.62		
	Competitors' actions or strategies	0.59		

TABLE 5: Descriptive statistics

Variables	No.of items	Theoretical Range	Actual Range	Mean	SD	Cronbach Alpha
Market competition	6	6-30	12-30	19.45	4.3	0.87
Strategic priorities	1	1-5	1-5	4.34	0.44	N/A
Multiple performance measures	40	40-200		89.96	8.49	0.93
Financial perspective	10	10-50	10-50	17.04	1.45	0.76
Innovation and learning perspective	11	11-55	11-55	24.55	2.12	0.83
Internal business perspective	10	10-50	10-50	30.18	3.67	0.71
Customer perspective	9	9-45	9-45	18.20	1.89	0.88
Firm Size (Tk. ⁶ m revenues)	N/A	N/A	Tk.1-500 m	Tk.265 m	672.6	N/A

Table 6: Pearson Correlations (n= 50)

Code	Variables	MC	SP	MPM	FP	ILP	IBP	CP	FS
MC	Market competition	1							
SP	Strategic priorities	0.45**	1						
MPM	Overall Multiple Performance Measures	0.57**	0.69**	1					
FP	Financial perspective	0.78**	0.76**	0.81**	1				
ILP	Innovation and learning perspective	0.53*	0.49**	0.54**	0.34**	1			
IBP	Internal business perspective	0.47**	0.44**	0.22*	**0.46	0.42**	1		
CP	Customer perspective	0.53**	0.65**	0.44**	0.56**	0.53**	0.43**	1	
FS	Firms size (Tk.m revenues)	0.02	0.04	-0.07	0.07	-0.05	-0.06	0.01	1

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

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

TABLE 7 (a)**Results of regression: The dependent variable = Overall performance measures usage**

Variables	Regression Coefficient	Coefficient Value	Standard Error	t-value	p (two-tailed)	Collinearity Statistics	
						Tolerance	VIF
Constant	b ₀	8.234	8.445	0.955	n.s	N/A	N/A
Market competition	b ₁	0.497	0.156	4.995	0.000	0.911	1.967
Strategic priorities	b ₂	0.194	0.596	1.783	0.025	0.956	1.457
Firms' size	b ₃	0.004	0.049	0.478	n.s	0.978	1.768

7 (b)

Model	R square	Adjusted R square	F	Sig
	0.5682	0.5308	16.531	0.000

TABLE 8: Supporting Regression Analysis*Panel A: The dependent variable= Financial perspective*

Variables	Regression Coefficient	Coefficient Value	Standard Error	t-value	p (two-tailed)	Collinearity Statistics	
						Tolerance	VIF
Constant	b ₀	4.563	1.784	2.453	0.043	N/A	N/A
Market competition	b ₁	0.453	0.034	4.450	0.000	0.911	1.967
Strategic priorities	b ₂	0.346	0.189	1.453	0.054	0.956	1.457
Firms' size	b ₃	0.001	0.000	1.458	n.s	0.978	1.768

Panel B: The dependent variable = Innovation and learning perspective

Variables	Regression Coefficient	Coefficient Value	Standard Error	t-value	p (two-tailed)	Collinearity Statistics	
						Tolerance	VIF
Constant	b ₀	3.988	2.563	1.450		N/A	N/A
Market competition	b ₁	0.552	0.676	5.231	0.000	0.911	1.967
Strategic priorities	b ₂	0.610	0.453	2.563	0.012	0.956	1.457
Firms' size	b ₃	-0.025	0.000	-0.031	n.s	0.978	1.768

Panel C: The dependent variable=Internal business perspective

Variables	Regression Coefficient	Coefficient Value	Standard Error	t-value	p (two-tailed)	Collinearity Statistics	
						Tolerance	VIF
Constant	b ₀	2.562	2.458	1.349	0.000	N/A	N/A
Market competition	b ₁	0.399	0.070	4.557	0.002	0.911	1.967
Strategic priorities	b ₂	0.345	0.099	1.541	0.000	0.956	1.457
Firms' size	b ₃	0.013	0.000	0.358	n.s	0.978	1.768

Panel D: The dependent variable= Customer perspective

Variables	Regression Coefficient	Coefficient Value	Standard Error	t-value	p (two-tailed)	Collinearity Statistics	
						Tolerance	VIF
Constant	b ₀	6.872	5.225	1.769	0.075	N/A	N/A
Market competition	b ₁	0.513	0.236	3.990	0.000	0.911	1.967
Strategic priorities	b ₂	0.167	0.184	1.561	0.074	0.956	1.457
Firms' size	b ₃	-0.003	0.000	-0.004	n.s	0.978	1.768

Panel E: Adjusted R²; F-value, p- value of variables Financial perspective, Innovation and learning perspective, Internal business perspective, Customer perspective.

Dimensions	R square	Adjusted R square	F value	Significance (p)
Financial perspective	0.315	0.299	9.555	0.000
Innovation and learning perspective	0.349	0.345	14.250	0.000
Internal business perspective	0.449	0.437	34.459	0.000
Customer perspective	0.375	0.364	19.233	0.000

TABLE 9: ANOVA Results: Mean Performance Scores

	Firms pursuing Prospector Strategy (Mean score)	Firms pursuing Defender Strategy (Mean score)	F-value (p*)
High use of Multiple performance measures	75.87	71.34	-8.75 (0.000)
Traditional performance measures (less uses)	73.78	72.45	

APPENDIX: Summary of the surveyed companies**APPENDIX Table 1 (a): Number of Employees**

Firms	Number of employees			
	25- 50 (In Percentage)	50-250 (In Percentage)	Over 250 (In Percentage)	Total
All sectors (n= 50)	4%	30.5 %	65 .5 %	100 %

Table 1 (b): Sales turnover (In Bd.Tk.* million)

Firms	Sales amount (in million Bd Tk.)					
	Less than 100	100-199	200-299	300- 399	400- 499	Over 500
All sectors (n= 50)	5 %	10%	20 %	45%	10%	10%

Bd.Tk.* = Bangladeshi Taka (Official currency)**Table 1(c): Total assets (In Bd.Tk. million)**

Firms	Total Assets (in million Bd Tk.)					
	Less than 100	100-199	200-299	300-399	400-499	Over 500
All sectors (n= 50)	5%	30 %	50 %	5 %	10 %	100 %