Full Length Research Paper

Performance measurement using balanced scorecard measures and strategy based on Miles and Snow’s typology in Iran

Abdullah Khani* and Morteza Ahmadi

Department of Accounting, Faculty of Administrative Science and Economics, University of Isfahan, Isfahan, Iran.

Accepted 12 September, 2012

This paper investigates the relationship between different types of strategy and application of different measures of balanced scorecard (BSC). The data used in this study were collected; using a questionnaire for a selective sample of 62 manufacturing companies listed on Iran's Tehran Stock Exchange (TSE). The results indicate that there is a positive relationship among analyzer strategy and application of the BSC measures in total and its separate perspectives. However, there is no significant relationship between prospector strategy and application of the BSC measures. Moreover, defender strategy has a negative impact on the application of overall BSC measures and internal processes measures.

Key words: Miles and Snow's typology, balanced scorecard, prospector strategy, defender strategy, analyzer strategy, reactor strategy.

INTRODUCTION

Today, companies have proceeded the era of "industrial competition" and have been infatuated with the era of "information" (Namazi and Abhari, 2010). With advent of the information era and intensified the competition, performance evaluation of organization is not possible through the analysis of past financial measures and applying performance assessment systems alone; instead, applying performance measurement systems (PMS) and strategic management is inevitable (Kaplan and Norton, 1996).

The conducted studies on the reasons of success large companies indicate the necessity of an appropriate management accounting system in achieving organizational objectives. The system provides the required information which assist managers for manufacturing products with low price, high quality, on-time delivery and innovation according to the market needs (Johnson and Kaplan, 1987).

In the early 1990s, Kaplan and Norton (1996) began a research project with the purpose of evaluating the success reasons of 12 superior US companies and studied their performance assessment methods. Their results indicate that the financial metrics, as the ultimate outcome that measures the company success should be combined with the metrics from three additional perspectives as drivers for creating long-term value: customer, internal processes, and learning and growth. The combined perspectives will result a comprehensive system for performance evaluation. Their findings confirmed that the companies should determine their overall objectives with respect to each one of these four perspectives and select some measures for evaluating the success rate in their objectives. Then, companies should determine quantitative targets for the each of these measures and finally should plan and implement necessary actions and initiatives to achieve their goals. They named this approach balanced scorecard (BSC)
and introduced the mission and strategy as its central core (Kaplan and Norton, 2001).

Kaplan and Norton (1996) noted that “all BSCs use certain generic measures which reflect the common objectives of many strategies, as well as similar structures across the industry and companies.” Hence, BSC framework can be a useful tool in interpreting strategic requirements of any type of strategy into a suitable and relevant performance measures.

A strategy is considered as the central contingent variable in management control systems since it can heavily influence the choice of applied performance measures, and in designing of accounting control systems should be considered the business strategy (Abernethy and Guthrie, 1994; McAdam and Bailie, 2002; Iselin et al., 2008).

The studies express that performance measurement system seems far from reality when the measures used are not relevant to the current strategies being pursued. The initial work in operations strategy presented by Skinner (1969) found that manufacturing strategy and performance measurement were originally linked together. A study by Ittner and Larcker (1997b) also found strong evidence that the choice of performance measures is a function of the firm's competitive strategy.

Ittner and Larcker (1998) and Banker et al. (2000) provide empirical evidence for strategic linkages between financial and non financial measures. Banker et al. (2004) also investigated the correlation between the managers' personal performance evaluations and the BSC's strategies. They found that when evaluators maintain some information about a given firms' strategies, they would imply the performance evaluation criteria which are directly related to the firms' strategies than that of the common measures. Jusoh and Parnell (2008) suggest that the top managers and designers of performance measuring tools in implementing their organization’s strategy should concentrate on the non financial performance measures.

In 2004, new policies were established regarding implementation of Article 44 in Iran's constitution. One of the main objectives of such adopted policies was promoting the economic efficiency and productivity of a given firm's production factors. Despite the abundance in human capital, petroleum and mineral sources, and financial and material capitals in Iran, productivity level of production factors is very low: the labor productivity is estimated as 1.2 to 1.3% and the capital productivity equal to 1% in 2007 (Mehnat far and Jafari, 2008).

The most of the firms subject to Article 44 of the Iran's Constitution are sold to the private sector in Tehran Stock Exchange (TSE). TSE, which is a member of the Federation of Euro-Asian Stock Exchanges and the World Federation of Exchanges (WFE), has been one of the world's best performing stock exchanges in the years 2002 through 2011. WFE announced in its reports that TSE has registered the best bourse index in Europe, Africa and the Middle-East in 2010 and 2011. Therefore, the fundamental changes in the management methods and concluding, doing further studies on management accounting (strategic performance management) in TSE will have particular importance.

This study intends to use the most credible approaches (Miles and Snow's typology and the Balanced Scorecard framework) to survey the correlation between the financial and nonfinancial measures of performance measurement and different strategies in the special emerging market (TSE), therefore, will develop managerial accounting studies in emerging markets.

The remainder of the paper is organized as follows. First, the literature review and the hypothesis development by emphasis on balanced scorecard framework, Miles and Snow's typology and theoretical linkages between them are introduced, in the other words, the alignment between Miles and Snow's Strategy and BSC Measures will be explained. Second, research methodology is described. Third, the results will be presented. Finally, the conclusions are explained.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Balanced scorecard (BSC)

Over the past decade, the balanced scorecard (BSC) has become a widely advocated management tool associated with "best practices". As a management tool, the BSC provides an enhancement to the traditional management planning and control system by looking beyond financial measures and considering nonfinancial measures. According to Kaplan and Norton (1996), the developers and staunch advocates of BSC: "The name reflected the balance between short-term and long-term objective, between financial and nonfinancial measures, between lagging and leading indicators, and between external and internal performance perspectives". The first version of BSC that was developed by General Electric in the 1950s was designed as a performance measurement system, but the BSC has now evolved into a strategic management tool critical to an organization's planning process" (Hendricks et al., 2004). Hoque and James (2000) indicate that BSC enhances higher improvement in organizational functions.

Darvish et al. (2012) indicated a positive significant relationship between the knowledge management model and the four perspectives of balanced scorecard. Luft et al. (2011) provide theory-based evidence that is potentially costly disagreements between subordinates and superiors is larger when a profit measure and an additional (non-redundant) performance measure are provided, rather than a profit measure only, as the basis
for subjective performance evaluations. Their study provides a potential explanation for why organizational policies sometimes limit the performance measures to be used for subjective performance evaluations only, thus excluding the potentially relevant information. However, the BSC requires that senior management interpret the firm's mission and strategy into four performance perspectives: financial, customer, internal business, and learning and growth.

Anand et al. (2005) found that the balanced scorecard adoption rate is 45.28% in corporate India which compares favorably with 43.90 per cent in the USA. Namazi and Allahyari (2010) presented almost 92.6% of selected companies in TSE are not explicitly engaged with the BSC. However, most of them are commencing some non-financial measures in their performance evaluation systems. Salehi and Ghorbani (2011) found that the efficiency evaluators of selected firms in TSE are mostly interested in using financial criteria rather than non-financial, also there was significantly difference between those evaluators who were familiar with BSC and the others.

Financial perspective (FP)

The financial perspective is the most important perspective of the BSC because it is the ultimate outcome measures of organization operations assessment. Other perspectives are not important unless they have financial effects and are reflected in the financial perspective. If the adjustments in the other perspectives do not reform the financial perspective, they should be revised according to company's mission and strategy (Kaplan and Norton, 2001). The following measures are the typical financial measures that can be applied: operating profit, rate of return on investment (ROI), and economics value added (EVA), operating cash flows, new products sales revenue, sale growth rate and the cost reduction rate.

Customer perspective (CP)

The mission statement of many companies is focused on the customer: convert to the best company by creating value for customer. BSC helps the managers interpreted the mission statement into specific measures that would indicate the following four critical factors for customers: time, quality, services, and price. The measures specified in this perspective are characterized in a manner that would let company realize its strategy regarding customer satisfaction (Kaplan and Norton, 2008). The following measures are the typical customer measures that can be applied: the market share indicator, the number of further purchase agreements by customers (customer loyalty), new customer percentage, rejected products, customer satisfaction level, number of customer complaints, on time product delivery, and customer's claims response indicator.

Internal business processes perspective (IBPP)

The internal business processes perspective determines the processes that satisfy the company shareholders and customers (Kaplan and Norton, 2001). The following measures are the typical internal business processes measures that can be applied: increased production quantity rate, number of new products and services, number of obtained certification or new patterns, ratio of the unspoiled finished goods to the total finished goods in every production process, needed time for manufacturing a product (manufacturing cycle time), labor efficiency variance, direct material quantity variance and percentage of spoiled products.

Learning and growth perspective (LGP)

The learning and growth perspective eliminates the gaps between the current levels of organizational infrastructures and the desired level for achieving the goals. In order to attend to the infrastructural gaps, learning and growth measures should be used in performance evaluation systems (Kaplan and Norton, 2008). Accordingly, the following measures are the typical learning and growth measures that can be applied: employee productivity percentage, employee work promotion opportunities indicator, average employees' service year, staff satisfaction and motivation indicator, staff training hours, and applied employee suggestions and viewpoints indicator.

Miles and Snow's strategic types

Ansoff (1984) believes that strategy consist of decision making rules that orientates the organization's general behavior. These rules determine how organizations relate to their external environment. Ansoff (1984) believes that the basic objectives determine the destinations that the organization seeks to achieve, while the strategy is the means of achieving those destinations. The strategy determines type of goods that the organization produces as well as the type of technology which the organization employs to produce the goods. There are many kinds of potential strategies to adopt and achieve sustainable competitive advantage, but it is important to identify the strategies that have a leading force (Aaker, 1995).

Different industries' organizations can be classified in the homogeneous behavior groups in terms of competition style, behavior, investment and risk acceptance and
in this manner could be better understood their behavior in the face with environmental changes. This strategic orientation introduces apparent clusters of companies that display homogeneous behavior in a heterogeneous environment (Parnell and Hershy, 2005). The Strategic orientation provides completely different perception from the competitive structure of the organization in an industry (Aaker, 1995).

In recent decades, many efforts are made to identify the organizations’ strategic orientations and a lot of strategic management frameworks are developed to classify organizations’ strategies. In one of these efforts, Miles and Snow (1978) have described four strategic orientations on the basis of managers’ perceptions from environmental uncertainty. Environment may be complex and uncontrollable for an organization and will be static and explicit for other organization. This concept implies that organizations themselves build their environments that rely on their perceptions. Therefore, environment is the perceptional mental (Robbins, 1990).

Miles and Snow (1978) studied that how managers react to perceived environmental uncertainty and developed general model for this reaction and it was named adaption cycle. The model consist three domains for organizations' strategies: the entrepreneurial, relating to how the organization orients itself to the marketplace; the engineering, referring to the technology and processes employed in producing products and services; and the administrative, embracing the organizational attempts in coordinating and implementing its strategies. Miles and Snow (1978) introduced four strategic types of organizations: prospector, analyzer, defenders, and reactors. The Miles and Snow (1978) typology is extensively applied in the strategy literature, and is generally been supported (Hambrick, 1983; McDaniel and Kolari, 1987; Parnell and Wright, 1993; Shortell and Zajac, 1990; Osland and Yapar, 1995; Conant et al., 1990; Walker et al., 2003; Desarbo et al., 2005; Jusoh et al., 2006).

The Prospector frequently changes its products and services in order to be first in the market. It tends to focus on innovation and flexibility in order to respond quickly to market changes.

The analyzer has relatively stable products and services while it selectively is moving into new areas. An analyzer tends to emphasize on formal planning processes and tries to balance cost containment and efficiency through taking risk and innovation.

The defender offers a relatively stable set of services to defined markets by concentrating on doing the best possible in its expertise area. It emphasizes on a tight control and operating efficiencies to reduce costs.

The reactor essentially does not a consistent strategy. Its strategy has characteristics of the previous mentioned strategies adopted in different time phases and thus is difficult to categorize it clearly (Shortell and Zajac, 1990).

Therefore, in this study we emphasize only on the other three strategies.

The alignment between Miles and Snow’s strategy and BSC measures

As mentioned in the introduction, manufacturing strategy and performance measurements are originally linked together. In order for the firms to effectively implement their strategy, they need to fully their performance measures to the requirements of their strategies so that they will perform better than others who do not consider this alignment. Jusoh (2010) suggests that BSC framework can provides a useful tool in interpreting the strategic requirements of prospector, defender, and analyzer into suitable and relevant performance measures. As Miles and Snow's strategic types address three dimensions of the "adaptive cycle" known as the entrepreneurial, the engineering, and the administrative that seem to fit well with the four perspectives of the BSC measures: financial, customer, internal business process, and learning and growth.

All the four perspectives of BSC measures would contribute to providing solutions to the entrepreneurial, engineering, and administrative problems. This fact is the basis reason that Miles and Snow's strategy was chosen in this study. Entrepreneurial problem deals with how to choose a product-market domain: a narrow, broad or segmented domain. It seems that it is an attempt to satisfy the customer at large and thus requires customer and marketing orientation. Thus, in solving entrepreneurial problems, the customer perspective of the BSC would provide good manner.

Engineering problem deals with the selection of an appropriate technology for production and distribution: cost-efficiencies, flexibility or innovation. This problem seems to focus on internal processes. Thus, internal business processes and learning and growth perspectives of the BSC would play an important role in providing solution to the engineering problem. This is because internal business processes perspective focuses on integrated business processes (Kaplan and Norton, 1996).

Administrative problem deals with the selection of areas for future innovation (leading perspective) and rationalization of the structure, the control and developing process (lagging perspective). For example, in the context of control, financial perspective of the BSC would play a pivotal role in maintaining stability and efficiency for a narrow and stable product-market strategy. The prospectors focus on entrepreneurial and administrative problem solving by emphasizing on creativity and flexibility over efficiency in order to respond quickly to changing market conditions and take advantage of new market opportunities (Miles and Snow, 1978). Prospectors are expected to be more marketing-driven (Jusoh et al.,
strategies of Reactor and applied of BSC perspectives. As a result, the reactor strategy is excluded here and no hypothesis is made on it. Based on the above discussion the following hypotheses are developed:

- **H₈:** The prospector strategy is positively associated with the customer measures, the learning and growth measures and it is negatively associated with the financial measures and the internal business processes measures.

- **H₉:** the defender strategy is positively associated with the financial measures and the internal business processes measures and it is negatively associated with the customer measures and the learning and growth measures.

- **H₁₀:** the analyzer strategy is associated financial measures and customer measures and internal business processes measures and learning and growth measures.

### RESEARCH METHODOLOGY

#### The population and sample

The data for the study was collected by using questionnaire that sent to middle and senior managers of TSE manufacturing companies in year 2011. Using the formula of Cochran, 106 companies was selected from among 279 manufacturing companies active on the TSE and the questionnaire was distributed among them that 62 questionnaires (after follow-ups) received and used in the data analysis. Therefore, the returned rate of the questionnaires was about 58%.

Most the companies are in automotive, basic metals, foods, and chemical products industries. General information of respondents indicates that their organizational position is financial manager and accounting chief officer. Most respondents have bachelor's degree in accounting, economics and management. About 65% of the respondents have more than ten years of managerial experience which adds to the credibility of responses.

#### Variable measurement

**Balanced scorecard measures**

In this study in order to determine the BSC measures as the dependent variable, conducted studies in Iran are carefully considered and the measures that have the most application are selected as the choice measures. Accordingly 29 measures of BSC are determined in the financial, customer, internal processes, and learning and growing perspectives and a five-point Likert scale ranging from “1=very low” to “5=very high” is used. Average BSC perspectives adoption is used to test the hypotheses. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.556, under the recommended value of 0.60 (Kaiser, 1974). As a result, it was not possible using factor analysis method (component validity) for the BSC measures to determine whether or not they fall within the balanced scorecard’s four dimensions. Hence, logical validity method adopted and Isfahan University accounting and management professors investigated and confirmed the research questions. A reliability check for the BSC measures produced Cronbach alpha coefficients of 0.81 (financial), 0.84 (customer), 0.84 (internal business process), 0.72 (learning and growth) and
Table 1. Descriptive statistics.

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Number of applied measures</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>7</td>
<td>1.29</td>
<td>4.57</td>
<td>3.38</td>
<td>0.737</td>
</tr>
<tr>
<td>Customer</td>
<td>8</td>
<td>1.38</td>
<td>5</td>
<td>3.29</td>
<td>0.739</td>
</tr>
<tr>
<td>Processes Business internal</td>
<td>8</td>
<td>1.50</td>
<td>4.62</td>
<td>3.48</td>
<td>0.670</td>
</tr>
<tr>
<td>Growth and learning</td>
<td>6</td>
<td>1.50</td>
<td>4.83</td>
<td>3.03</td>
<td>0.778</td>
</tr>
<tr>
<td>Total (BSC)</td>
<td>29</td>
<td>2.14</td>
<td>4.38</td>
<td>3.31</td>
<td>0.579</td>
</tr>
</tbody>
</table>

Panel B: Descriptive statistics on the importance of the applied BSC measures

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Average</th>
<th>Std. deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sale growth rate*</td>
<td>3.77</td>
<td>1.156</td>
</tr>
<tr>
<td>EVA+</td>
<td>2.77</td>
<td>1.116</td>
</tr>
<tr>
<td>Customer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market share Indicator*</td>
<td>3.77</td>
<td>1.078</td>
</tr>
<tr>
<td>Number of customer complaints+</td>
<td>2.84</td>
<td>1.157</td>
</tr>
<tr>
<td>Business internal processes prospective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>increased production quantity rate*</td>
<td>3.97</td>
<td>0.809</td>
</tr>
<tr>
<td>number of obtained certification or new patterns+</td>
<td>3.03</td>
<td>1.008</td>
</tr>
<tr>
<td>Growth and learning prospective</td>
<td></td>
<td></td>
</tr>
<tr>
<td>employee productivity percentage*</td>
<td>3.53</td>
<td>1.178</td>
</tr>
<tr>
<td>average employees’ service year+</td>
<td>3.03</td>
<td>1.008</td>
</tr>
</tbody>
</table>

* The most importance. + The least importance.

0.92 (Overall BSC). The values are more than the lower limits of normal acceptability which is usually considered to be 0.70 (Nunnally, 1978).

Business strategy

This study adopts the multi-item scale of Conant, Mokawa and Varadarajan (1990) for measuring of the strategy (Dyer and Song, 1997; Desarbo et al., 2005). The scale consists of eleven strategic questions. Four options assigned for every question. The option should choice that has the most consistent with the organizational characteristics. We aware the relation between each question (scores) and the strategy type, but the respondent does not. Consequently, after we received each of the returned and answered the questionnaire, the selected scores sorted on the base of Miles and Snow strategic types. Conant et al. (1990) calculated the reliability of the strategic questions using a paired comparison test that had verified reliability of 75% of these questions.

RESULTS

Descriptive statistics

The descriptive statistics are exhibited in Tables 1 and 2. The information about the BSC measures is presented in Table 1. Panel A of the Table 1 represents that the business internal processes perspective has the most importance perspective and the financial, customer, and learning and growth perspectives set sequentially in the second stage of the importance. The average applied the BSC measures is 66% (3.31÷5; five-point Likert scale). Panel B of the Table 1 indicates that the increased production quantity rate has the most importance measure and the average employees’ service year has the least importance measure in the performance evaluation system.

The information about strategic dimensions is presented in Table 2. Panel A of the table demonstrates that the most companies have chosen the defender strategy in respect to the following strategic dimensions: diversity of products and services, competitive advantage respect to product and services, manager’s skills, current planning, organizational structure and performance evaluation procedures. They have chosen the analyzer strategy in respect to the other dimensions. The most the consensus on the strategic dimensions is related to performance evaluation procedures (62% "defender strategy") and the least the consensus is related to future planning (31% "analyzer strategy").

Panel B of the Table 2 indicates that in the respect of entrepreneurship problem more companies apply reactor strategy (32%), in regard to engineering problem they apply analyzer strategy (39%), and in the respect to the
Table 2. Descriptive statistics.

<table>
<thead>
<tr>
<th>Adaptive cycle components</th>
<th>Strategic Dimensions</th>
<th>Prospector</th>
<th>Analyzer</th>
<th>Defender</th>
<th>Reactor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entrepreneurial</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Diversity of product and services</td>
<td>13%</td>
<td>21%</td>
<td>42%</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>Competitive advantage of product and services</td>
<td>5%</td>
<td>8%</td>
<td>48%</td>
<td>39%</td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>Market surveillance time</td>
<td>21%</td>
<td>45%</td>
<td>3%</td>
<td>31%</td>
<td>100%</td>
</tr>
<tr>
<td>4</td>
<td>Growth approach</td>
<td>6%</td>
<td>39%</td>
<td>23%</td>
<td>32%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Engineering</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Internal Processes structure</td>
<td>6%</td>
<td>54%</td>
<td>16%</td>
<td>24%</td>
<td>100%</td>
</tr>
<tr>
<td>6</td>
<td>managers skills</td>
<td>11%</td>
<td>39%</td>
<td>31%</td>
<td>19%</td>
<td>100%</td>
</tr>
<tr>
<td>7</td>
<td>Market station preservation Method</td>
<td>18%</td>
<td>27%</td>
<td>37%</td>
<td>18%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Administrative</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Current planning</td>
<td>19%</td>
<td>35%</td>
<td>31%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>9</td>
<td>Future planning</td>
<td>23%</td>
<td>23%</td>
<td>31%</td>
<td>23%</td>
<td>100%</td>
</tr>
<tr>
<td>10</td>
<td>Organizational structure</td>
<td>13%</td>
<td>16%</td>
<td>55%</td>
<td>16%</td>
<td>100%</td>
</tr>
<tr>
<td>11</td>
<td>Performance evaluation procedures</td>
<td>6%</td>
<td>24%</td>
<td>62%</td>
<td>8%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Panel B: Descriptive statistics on adaptive cycle components according to strategic types

<table>
<thead>
<tr>
<th>Adaptive cycle components</th>
<th>Strategic Dimensions</th>
<th>Prospector</th>
<th>Analyzer</th>
<th>Defender</th>
<th>Reactor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entrepreneurial</strong></td>
<td>1 to 4</td>
<td>11%</td>
<td>28%</td>
<td>29%</td>
<td>32%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Engineering</strong></td>
<td>5 to 7</td>
<td>12%</td>
<td>39%</td>
<td>28%</td>
<td>21%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Administrative</strong></td>
<td>8 to 11</td>
<td>15%</td>
<td>25%</td>
<td>45%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Miles and Snow's Typology</strong></td>
<td>1 to 11</td>
<td>13%</td>
<td>30%</td>
<td>35%</td>
<td>22%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3. One-sample Kolmogorov-Smirnov test.

<table>
<thead>
<tr>
<th>BSC</th>
<th>Financial</th>
<th>Customer</th>
<th>processes</th>
<th>Learning</th>
<th>Prospector</th>
<th>Analyzer</th>
<th>Defender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>.701</td>
<td>1.350</td>
<td>.840</td>
<td>.731</td>
<td>.772</td>
<td>2.079</td>
<td>1.420</td>
</tr>
<tr>
<td>Sig.</td>
<td>.710</td>
<td>.052</td>
<td>.480</td>
<td>.658</td>
<td>.591</td>
<td>.000</td>
<td>.035</td>
</tr>
</tbody>
</table>

administrative problem they apply defender strategy (45%). In the regard to all of the eleven dimensions defined for Miles and Snow’s typology, companies’ emphasis is the most on the defender dimensions (35%) and their emphasis is the least on the prospector dimensions (13%).

**EMPIRICAL RESULTS**

**Hypotheses test**

We first test normality using Kolmogorov-Smirnov test. The results indicate that all the variables are normal except variables of prospector strategy and analyzer strategy (Table 3). Accordingly, Spearman correlation coefficient is used in examining the correlation among prospector and analyzer strategies with the BSC measures, and Pearson correlation coefficient is used in examining the correlation between defender strategy and BSC measures (Table 4).

As shown in the Table 4, in confidence level 95% there are no statistically significant correlation between the BSC prospective measures, in total and in separate, with the firms’ emphasis on prospector strategy (Hypothesis 1). This means that the increase or decrease of the firms’
emphasis on prospector strategy dimensions has no analyzer strategy and application of BSC measures.

Simultaneous effect of strategy types on BSC measures

Multiple regressions are applied to investigate the simultaneous effect of success strategy types (Miles and Snow, 1978) on the BSC measures application (Table 5). The result presented in Table 5 indicates that among Miles and Snow's strategic types, the analyzer strategy is only effective in applying the overall BSC measures (model 5), financial perspective measures (model 1) and customer perspective measures (model 2).

Effect of demographic characteristics on the study results

The t-test for independent groups applied to determine the effects the respondents' education levels and their managerial experience. The result indicates that despite of the difference in managerial experience and educational degree, respondents have the same opinions on the questions of the questionnaire.

Conclusions

This paper demonstrated the increased production quantity rate and the average employees' service year respectively have the most and the least importance in performance evaluation system of TSE's manufacturing companies. On the average, the companies apply 66% BSC measures in their performance evaluation and compensation systems. The results represent that the companies consider the internal business processes measures at the most important and then the financial measures, the customer measures, and the learning and growth measures, respectively. The main reason should be that Iranian's firms follow the cost management strategies, especially internal failure cost reduction (Imankhan et al., 2009). Therefore, they emphasis more on internal processes measures in performance evaluation and compensation systems as a best way for achieving the objectives, especially for the defender companies.

The results of the hypotheses test reveal the existence of a direct correlation between the emphasis on analyzer strategy and the BSC measures applications, therefore the BSC system can be effective for the analyzer companies. Moreover, contrary to the literature, no correlation exists between the prospector strategies and applies of the BSC measures.

According to this study, TSE manufacturing companies have the most emphasis on the defender strategy and the least emphasis on the prospector strategy. However, the results demonstrate that the correlation between defender strategy and BSC measures is inconsistent with the research literature. Simons (1987) states in order to maximize their efficiency, the defenders extremely apply their financial measures. The results of this study exhibit that no correlation exists between financial measures application and defender strategy. Emphasizing more on defender strategy has negatively effect on the internal process measures and overall BSC measures.
application.

The management accounting literature in TSE (Etemadi, 2001; Khodami and Talebi, 2010; Namazi and Abhari, 2010) and interview with some of the respondents, explain the most important reasons for the study inconsistency as follow:

1. Taking sectional and short-term policies by government and instability of import and export policies.
2. Lack of completion in the market place for some industries and organizations.
3. Existence of the large public institutions and mono or duopoly in producers or distributors of the goods or services.
4. Human Force has less skill and less knowledge.
5. Less communication between financial department and other departments.

REFERENCES


