

# Designing an Evaluation Model of Marketing Performance Using Structural Equation Model in Arak Petrochemical Company

Esmael Malekakhlagh

Department of Management, Guilan University

Tel: 09111343809 E-mail: malekakhlagh@guilan.ac.ir

Esmael Ramezanpoor

Department of Management, Guilan University

Tel: 09111430069 E-mail: esmaeel\_ramezanppor@yahoo.com

Seddigheh Izadyar (Corresponding author)

Address: University of Guilan, Rasht, Iran.

Tel: 09112337137 E-mail: seddighehizadyar@yahoo.com

## Abstract

Using a measurement scale for marketing performance has caught the attention of all academic associations and business companies in this competitive world. Evaluating the marketing performance is on the agenda for managers since the key to achieve a constant improvement in being able to measure and evaluate the performance of an organization. However, there is not a comprehensive and unified understanding of the process of marketing performance and the influential factors affecting the measurement of marketing performance in companies at academic level.

At the present study, a multidimensional scale and variable has been designed to evaluate the success of marketing performance. Based on the studies conducted, the main dimensions of evaluating marketing performance are latent variables of marketing performance construct, which include sale promotion, development of market share, and improvement of market management. In addition, the measurement indices for the each success dimension of marketing performance have been approved in petrochemical industry by the use of factor analysis and Structural equation modeling.

**Keywords:** Marketing performance, Sale promotion, Market management, Market share increase, Structural equation modeling

## 1. Introduction

Developing a measurement scale for marketing performance has always been a noticeable issue in academic researches on marketing. It has also been a very important issue for companies. Nevertheless, there have been few scientific and practical studies at academic level regarding measurement of marketing performance (Sullivan and Abela, 2007, Lamberti and Noci, 2010). At the present decade, the tool for the measurement of marketing performance has been paid attention, and business companies are heading toward identifying and measuring marketing performance in order to respond to market demands (Clark 2001; Morgan, Clark et al. 2002, Pont and Shaw, 2003).

According to Morgan (2002), marketing performance enjoys multidimensional and dynamic processes. These two features play an important role in the prescriptive structure of measurement system of marketing performance. In a dynamic view, the theory of competitive advantage says that marketing performance is a process that can be defined in four general stages. The sources of competitive advantage include acquisition,

development, resources deployment, and company's abilities. Situational advantages display the company's strategies with regard to customer value and the expenses the company undergo. The result of marketing performance shows that customers and competitors respond to the situational advantages identified and results are the final performance related to the expenses and benefits a company earns. (Morgan et al., 2002, Oyedijoet. et al., 2012).

The term "marketing performance" is used as a general performance structure, and it investigates financial aspects and market. Financial performance is defined as merging profits and capital return while market performance is said to be market share and sale volume ( Jaakkola et al, 2010). Marketing performance is based on the company's objectives that usually involve the profiteers and cash flow or profits. Marketing result must be compared with the related company's objectives. These objectives include customers, final customers, brand, and competition. The efficacy of marketing that increases only in the environment is determined by the objectives (Brinckmann et al, 2010).

The results of past researches indicate that measuring market performance is a fundamental element in the success of organizations and business companies, particularly with the new requirement along with the high speed of changes and high competition in marketing. The present study tries to design a valid and reliable scale for measuring marketing performance by identifying the most important dimensions of marketing performance. First, a review of related literature will be presented. Second, the main dimensions of marketing performance will be identified. Third, factor analysis, and Structural equation modeling will be used to deal with valid measurement of the model designed. Finally, conclusion and suggestions are presented.

## 2. Review of literature

Designing an authentic scale for evaluating market performance is not a new academic issue rooting from studies of 1960's and 1970's decades. Measuring marketing performance has long been a central concern in marketing (e.g. Parker, 1962; Feder, 1965) and remains a vital issue for many corporations (Jaakkola et al 2010, morgan et al., 2002). The pioneer work in this area was Sevin (1965) and Goodman (1972) investigation. These works adopted an accounting perspective to identifying the profit impact of marketing. (Ambler et al. 2004, Sullivan and Abela, 2007)

Later work by Shapiro and Kirpalani (1984), Foster, and Gupta (1994) sought to build on these earlier studies by improving the interface between marketing and accounting. An accounting perspective continues to influence practitioners, as can be seen by the frequency with which marketing is assessed through financial measures (Jaworski and Kohli, 1996). Research conducted in the 1980s and 1990s led to a broadening of performance measures to include non-financial as well as financial evaluations. Notable here was the inclusion of measures of market share (Buzzell and Gale 1987; Szymanski, Bharadwaj et al. 1993), customer satisfaction (Selnes 1993; Piercy and Morgan 1995), customer loyalty (Churchill & Brown, 2004; Jones and Sasser 1995) and brand equity (Aaker and Jacobson 1994). The next major wave of research interest coincided with the emergence of e-commerce. There has been what Clark and Clark (2003) describe as a frenzy of activity in this area since the late 1990s.

Based on previous works it is clear that the main concern of most marketing practice studies relates to the effectiveness of the company's marketing activities. Market orientation proponents call for a customer and competitor orientation as providing a coherent basis for value-creating actions (Slater & Narcer, 1994) hence implying that market orientation is the implementation of the marketing concept as posited by Kohli and Jaworski (1990). MP on the other hand is unconcerned with internal orientation as it focuses on efficiently managing the marketing function or the mix elements. The perspective of MP appears to be influenced mainly by the company's management of the marketing mix elements; the efficacy and usefulness of its market research; the appropriateness of positioning strategies; and the nature of its marketing goals (Ellis, 2005, Oyedijoet et al., 2012).

Table 1. Adopted from Clark's summary exhibit, existing research on performance measurement in marketing.

Table 1: Studies of Marketing Performance Measurement Measures	Author
<b>Single Financial Output Measures</b>	
Profit	Sevin (1965); Goodman (1972)
Sales Revenue	Feder (1965)
Cash Flow	Buzzell and Chussil (1985); Day and Fahey (1988)
<b>Non-Financial Measures</b>	
Market Share	Buzzell and Gale (1987); Jacobson (1988); Szymanski, Bharadwaj et al. (1993)
Quality of service	Bucklin (1978)
Adaptability	Walker and Ruekert (1987); Bhargava, Dubelaar et al. (1994)
Customer Satisfaction	Oliva, Oliver et al. (1992); Peterson and Wilson (1992); Anderson and Sullivan (1993); Selnes (1993); Donaher and Mattson (1994); Halstead, Hartman et al. (1994); Hauser, Simester et al. (1994); Piercy and Morgan (1995); Spreng, MacKenzie et al. (1996); Fornell, Johnson et al. (1996); Anderson, Fornell et al. (1997)
Customer Loyalty	Oliva, Oliver et al. (1992); Anderson and Sullivan (1993); Selnes (1993); Teas (1993); Dick and Basu (1994); Reichheld (1994); Jones and Sasser (1995); Fornell, Johnson et al. (1996); Teas and Palan (1997); Voss, Parasuraman et al. (1998)
Brand Equity	Barwise (1993); Keller (1993); Aaker and Jacobson (1994); Ambler and Barwise (1998); Haigh (1998); Keller (1998); Selnes (1993); Simon and Sullivan (1993); Lasser, Mittal et al. (1995)
<b>Input Measures</b>	
Marketing Assets	Piercy (1986); Srivastava, Shervani et al. (1998)
Marketing Audit	Kotler (1977); Brownlie (1996); Rothe, Harvey et al. (1997)
Marketing Implementation	Bonoma (1985); Bonoma (1986); Bonoma and Crittenden (1988)
Market Orientation	Kohli and Jaworski (1990); Narver and Slater (1990); Kohli, Jaworski et al. (1993); Day and Nedungadi (1994); Slater and Narver (1994); Deshpande and Farley (1998); Han, Kim et al. (1998); Jaworski and Kohli (1996); Wrenn (1997); Narver and Slater (1998)
<b>Multiple Measures</b>	
Efficiency	Kotler (1977); Bonoma and Clark (1988); Dunn, Norburn et al. (1994)
Effectiveness	Walker and Ruekert (1987); Sheth and Sisodia (1995)
Multivariate Analysis	Bhargava, Dubelaar et al. (1994); Spriggs (1994)

### **3. Research methodology**

The present study is fundamental research aiming at identification of dimension and designing a scale to measure the success of marketing performance. Based on the data collection procedure, library study and field research such as questionnaire have been used in this study. The subject population includes managers and supervisors of Arak petrochemical company, and sampling was conducted by Cochran formula. Based on the calculations, the volume of sampling was estimated to be 194 subjects. Regarding the technique of Structural equation modeling (SEM) used in this research, the minimum volume recommended should be 200 subjects. Finally, 200 questionnaires were distributed.

Following Churchill's (1979) suggestion for scale development, once the dimensions were identified, a pool of items should be generated for each dimension of the construct. Therefore, to develop the valid scale, the most important dimensions of successful marketing plan were first identified on the basis of literature of the research and interview conducted with experts and specialists in this field. Later, a collection of items was identified for each dimension. To check the validity of the scale, content analysis was used, and to calculate the reliability, confirmatory factor analysis was utilized. The analytic model of the study and the scale developed were calculated by Structural equation modeling. This modeling is a comprehensive statistical approach for testing hypothesis that question the relationship between observed and latent variables. Through this approach, the acceptability of theoretical models can be tested for certain populations by the use of correlation, experimental and non-experimental data. One of the most powerful and suitable method of analysis in behavioral and social science is multivariate analysis. This type of analysis refers to a series of analysis whose characteristic is the simultaneous analysis of K as independent variable and N as dependent one. Finally, the LISREL statistical software was used to analyze the data collected.

### **4. Identification and purification of items for marketing performance**

Internal analysis often begins with the analysis of existing financial situation, rate of sale, market share, and profitability. Each one of these can be an indication of market stability for a product and the ability of competitive production of that product. Additionally, these can be the signs of successful strategies of the past that can help estimate the need to change a strategy. Thus, it is of no surprise that it is extensively used as a means of evaluating performance (Aker, 2010). Based on the studies conducted by Jaworski, and Kohli (1994) and Harker (2000), in the present study, rate of sale, market share, and market management have been chosen as the measuring elements for marketing performance.

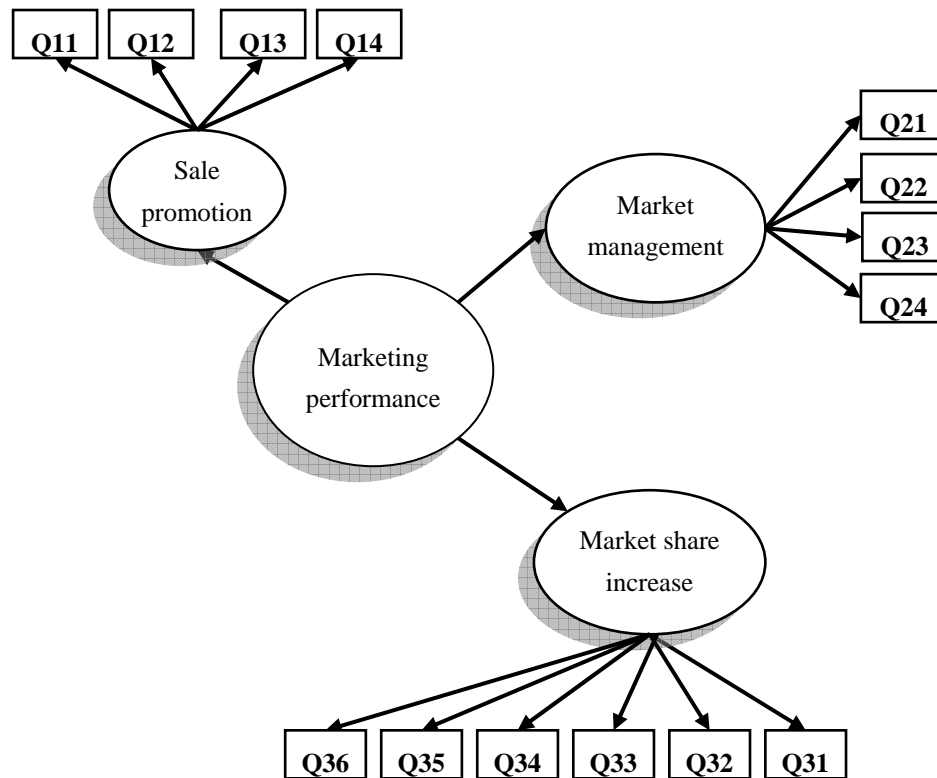


Figure 1. Marketing performance variables

#### 4.1 Sale and market share

Sale and market share are sensitive criteria to indicate the way customers attend to goods and services. Furthermore, if the value changes for a customer, sale and market share will be affected. It is sometimes delayed likely for customer and market Inertia. The rate of sale is strategically important. Sale increase means an increase in the number of customers, and more customers means more sales and more profit finally. Share increase makes accessibility to sustainable competitive advantage possible through scale economy and effects of experiment curve (Aker, 2010)

Market share, simply put, means organization's sale is a part of total sale. In other word, the organization's product has a share in total market. Market share grant an organization a very simple way to compare its improvement with that of its competitors in a certain period of time. Thus, most marketing programs are based on a strategic goal related to market share to some extent. In addition to being a kind of indicator, market share presents a clear view about the reality of potential success of an organization; it also indicates the rate of profitability of a product and the profession of the organization in the future. Most experts believe that market share is indicative of stable situation for profitability and argue that those who have more market share will have more profits and will be more successful than other competitors (Hiam, 2010).

#### 4.2 Analysis of sale

Analysis of sale involves breaking down the general data of sale into sale data of each group of product, consumer-related data, distribution channels, sale regions, and the rate of sale. The purpose of conducting an analysis is to find the weak and strong points of, say, those products which have the highest and lowest sale rates, the customers that contribute most part of the company's income, sale stuff, and sale regions which all have the best and the worst performance. Analysis of sale makes it clear that the data related to expenses and total sales generally hide the real situations. Analysis of sale based on sale region indicates

product family, size of order, and type and size of customers that have small orders. The determining factors of sale rate and the size of market share are part of some other important factors. About consumer goods, factors such as effective distribution, relative price, keeping or changing customers' view about certain product and comparison of that product with that of the competitors play important roles (Walker, et al. 2010).

#### 4.3 Market management

Market management is defined as the analysis of market, planning, and controlling the plans that are carried out with the purpose of gaining a desirable level of market exchange. Accomplishing this purpose requires regular and constant analysis of the influential factors in market, recognition of needs and demands of consumers for making decisions about the type of goods, pricing methods, communication channels, and distribution methods. It is generally believed that marketing management is an attempt to find sufficient customers for a company's existing products. This view is, however, a very limited one. A company, at any period of time, may face lack of enough demands, irregular and unusual demands, or high demands. The duty of marketing management is to find appropriate solutions to these situations. This duty is not only to seek for demand and its increase, but also to change or even reduce it. Therefore, to reach the company's objectives, marketing management endeavors to impress the level, timing, and the nature of demand in a way or the other. In other words, marketing management, is the same as demand management. Here, marketing management is defined as an analysis, planning, administration and control of programs that are to achieve organizational objectives; programs with the purpose of making and keeping profitable exchanges with buyers (Kotler and Armstrong, 2011). We have defined marketing management as conscious attempt conducted to achieve positive outcomes of exchange with target markets. The questions here are, "what insights can direct these marketing attempts?" and "what is the importance of interests of company, customers, and society"? The interests of these groups are in contrast in many cases. It is clear that marketing activities should be conducted under a sensible insight. This insight should enjoy needed efficacy and socially high responsive. (Kotler, 2011).

#### 5. Reliability and validity of the scale

Content analysis was used to ensure the validity of scale, in such a way that the scale of performance measurement for marketing was given to number of experts and specialists. They were asked to give their views about the questions and hypotheses. They approved the scale unanimously.

To develop a reliable scale confirmatory factor analysis can be used. In the present study, confirmatory factor analysis has been used to validate the identified dimensions of marketing performance and also the questions for each dimension.

The methods of extracting principle components and Varimax have also been utilized. Before carrying out the confirmatory factor analysis, KMO was calculated to be 0.926. Since the KMO reached was over 0.7, the existing correlation was appropriate for confirmatory factor analysis. The results of analysis done on indicators of marketing performance are presented in table 2.

Table 2. Confirmatory factor analysis for performance criteria of marketing

	Loading factor	Eigenvalue	Cronbach's alpha
<b>Measurement indicators of sale promotion factor</b>		14.045	.829
Advertisement as the main working program	.70		
Attempt to improve advertisement programs	.61		
Attempt to collect information on the competitors' sale rate	.78		

Training courses for sale promotion	.77		
<b>Measurement indicators of market management factor</b>		3.186	.805
Controlling the current process and changes of market	.78		
Recognizing the level of needs and demands of consumers	.76		
Consistency among various parts of a business unit	.75		
Required planning for pricing policy of products	.73		
<b>Measurement indicators of market share increase factor</b>		1.677	.86
Attempt to provide services to a vaster parts of market	.63		
Presenting services and attracting potentials customers	.78		
Presenting more and vaster services and goods to customers	.86		
Recognizing customers' preferences sooner than competitors	.82		
Constant attention to market changes to increase market share	.60		
Budget allocation to recognize new markets	.48		

## 6. Structural model of the study

Having identified the dimensions and variables measuring the success of marketing performance and ensuring the validity and reliability of scales, Structural equation modeling was used to carry out final test on the developed scale. Generally, the relationship among variables in Structural equation modeling is divided into two domains:

1. Measurement model or confirmatory factor analysis: relationship between latent and observed variables
2. Structural model or path analysis model: relationship between latent and latent variables

Each domain has been studied on the basis of a factor structure in final model. Structural equation modeling was used to carry out this purpose.

Some important point need to be paid attention to in Structural equation modeling: the relation power between factor (latent variable) and observed variables are shown by confirmatory factor. Confirmatory factor is between e relation will be considered weak. Confirmatory factor of between 0.3 and 0.6 is acceptable, and it is very desirable if it goes beyond 0.6. When correlation among variables are identifies, a meaningful test must be conducted. To survey the observed meaningful correlations T-value is used. If the T-value is larger than 1.96 at %5 level of significance, the observed correlation will be considered meaningful. For testing the fitness of model, goodness indicators are used. One of the most common

indicators for goodness fitting is RMSEA indicator. If it is smaller than 0.1, the model enjoys suitable goodness, and the results can be trusted (Clain, 1990).

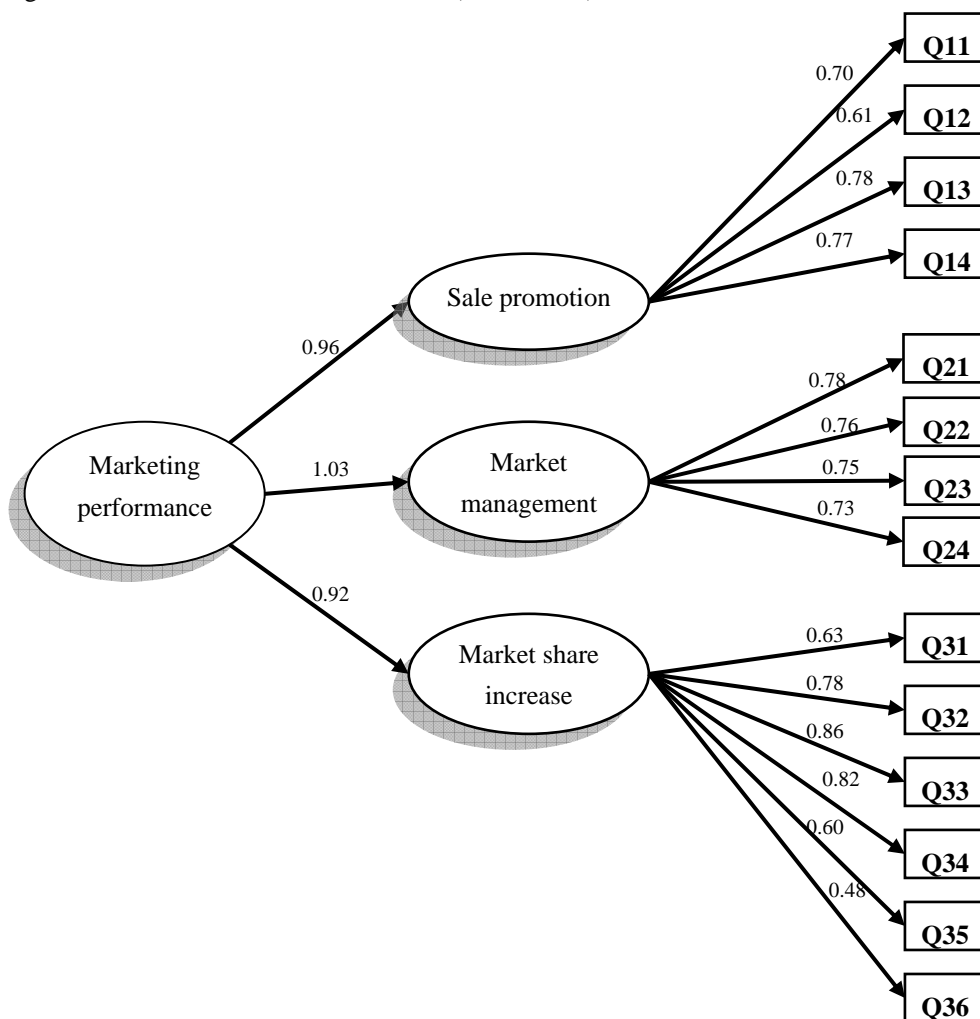


Figure 2. Structured model of the study

Based on the results reported in table 2 and figure 3, all three factors identified for marketing performance in confirmatory factor analysis have a confirmatory factor larger than 0.6. Thus, the factor structure of study was confirmed.

In addition, the load factor of all identification indicators is measured for the marketing performance. The findings reveal that every collection of indicators of each factor has high correlation with each other and their correlation with other indicators is trivial. . Thus, confirmatory factor analysis indicates that measurement scale developed for marketing plan enjoys needed reliability.

Table3. Indicator for goodness of fitting in Structural model of the study

Fitting indicator	SRMR	RMSEA	GFI	AGFI	NFI	NNFI	IFI
Acceptable amount	<0.05	<0.1	>0.9	>0.9	>0.9	>0.9	0 - 1
Calculated amount	0.035	0.025	0.93	0.97	0.94	0.95	0.96



Finally, for fitting the Structural model, a number of indicators for goodness of fitting have been used. Since the indicator RMSEA is equal to 0.025 and smaller than 0.1, the model has a good fitting. The other indicators for goodness of fitting have also been accepted.

## 7. Discussion and conclusion

Measurement models of marketing performance are developed to help the companies reach their objectives. Measuring marketing performance has always been considerable point for managers and researchers, and various studies have been carried out in this regard. In the present study, theories and researches regarding the measurement factors of management performance conducted in the past researches have been investigated and analyzed. Accordingly, a framework based on three criteria of sale promotion, market management, market share increase has been presented. The main criteria identified for measuring marketing performance were identified based on past studies, researches, and interviews with experts and specialists. To develop a valid scale in order to measure the success of marketing performance content analysis has been used. After the success dimensions of marketing performance were identified, measurement statements for each dimension was determined. To preserve the reliability of the identified dimensions of marketing performance and to validate the measurement statement of each dimension, confirmatory factor analysis was used. According to the findings, all three factors identified for marketing performance confirm the factor structure of the study. Similarly, the loading factor of each identified indicator for marketing performance criteria was estimated showing a high correlation among them and low correlation with other indicators. Finally, the analytic model of study and the scale developed were evaluated through Structural equation modeling. Based on evaluation of goodness fitting, the model enjoys suitable fitting. As a result, the petrochemical company of Arak can make use of measurement statements presented here to evaluate its performance based on the success measurement of marketing performance in each one of the three dimensions dealt with in the present study.

## References

1. Aker, D. (2010). Management of market strategy. Translation: Roosta, A. (1st ed.) Aryana ghalam Publications
2. Ambler, T., F. Kokkinaki, et al. (2001). Assessing Marketing Performance: The Current State of Metrics, London Business School, Centre For Marketing and Psychological Measurement, 20, pp. 141 - 151.
3. Churchill Jr., G. A., Brown, T. J. (2004). Basic marketing research (5th ed.). Australian: Thomson South – Western.
4. Clain, P. (2001). Easy Guide to Factor Analysis. Translation: Sadrolsadat, J., Minaie, A. (1st ed.) Samt Publications.
5. Clark, B.H. (1999). Marketing performance measures: history and interrelationships. Journal of Marketing Management, vol. 15, pp. 711-732.
6. Clark, B. H. (2001). A summary of thinking on measuring the value of marketing, Journal of Targeting, Measurement and Analysis for Marketing, vol. 99, no. 4, pp. 357-369.
7. Ellis, P. (2004). Market orientation and performance: A meta-analysis and cross-national.
8. Feder RA. (1965). How to measure marketing performance. Harvard Business Review, vol. 42. pp. 43:132 (May–June).
9. Goodman, S. R. (1972). The marketing controller. New York, AMR International.
10. Hiam, A. (2011). Marketing in human language. Translation: Aghaie, H. A. (2nd ed.) Hirmand Publications.
11. Jaakkola, A., Kristian M.A., Petri P. A., Heiner E., Hans. M. (2010). Strategic marketing and business performance: A study in three European engineering countries, Industrial Marketing

- Management 39, 1300–1310.
12. Jaworski, B. J., & Kohli, A. K. (1994). Market orientation: Antecedents and consequences".
  13. Jaworski, B. J., & Kohli, A. K. (1996). Market orientation: Review, refinement, and roadmap". *Journal of Market-Focused Management*, 1, 119 – 135.
  14. Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational Journal of Marketing*, 57 (3), July, pp. 53 – 70.
  15. Kline, R. B. (1998). Principles and practice of structural equation modeling. New York: Guilford Press.
  16. Kotler, F. (2011). Marketing management. Translation: Forozaneh, B. (9th ed.) Amookhteh Publications.
  17. Kotler, F., Armstrong, G. (2011). Principles of marketing. Translation: Forozaneh, B. (13th ed.) Amookhteh Publications.
  18. Kotler, P., & Keller, K. L. (2006). Marketing management (12th ed.). New Jersey: Pearson Prentice Hall.
  19. Lamberti, L., Noci, G. (2010). Marketing Strategy and Marketing Performance Measurement System: Exploring the Relationship. *European management Journal*, Vol. 28, pp.139-152
  20. Morgana, A., Bruce, H. Clarkb, R. G. (2002). Marketing productivity, marketing audits, and systems for marketing performance assessment Integrating multiple perspectives, *Journal of Business Research* 55 363– 375.
  21. Sullivan, D., Abela, A. V. (2007). Marketing performance measurement ability and firm performance. *Journal of Marketing* 71(April), 79–93.
  22. Oyedijo, Ade., Adekunle A. Idris., Adekunle A. Aliu. (2012). *European Journal of Economics, Finance and Administrative Sciences*, ISSN 1450-2275 Issue 46.
  23. Parker D., Mark, J (1962). Improved efficiency and reduced cost in marketing. 26(2):16.
  24. Pont, Marcin., and Shaw, Robin. (2003). Measuring marketing performance: a critique of empirical literature, ANZMAC, Conference Proceedings Adelaide 1-3 December.
  25. Rezaieyan, A. (2011). Principles of organization and management. Humanities research and development. (14th ed.), Samt Publications, Tehran.
  26. Sevin, C. H. (1965). Marketing productivity analysis. New York, McGraw Hill.
  27. Walker, O., Harper, W., Warsh, J., Claud, J. (2010). Marketing strategy. Translation: Arabi, M., Izadi, D. (3rd ed.) Office of Cultural Researches.