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Marketing Mix Elements - A Case Study on Steel Industry Export

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Abstract

Steel industries play a key role in the national economy and welfare of the society in many steel manufacturer countries. It is found that manufacturing and consuming of steel products would be a key indicator to measure and evaluate economic and industrial performance of a country. Nowadays, countries with the large natural oil and gas resources (e.g. Iran) attempt to select an alternative economic approach to utilize the resources in steel manufacturing rather than export the raw natural resources. While steel products have an enormous consumption market in the world, having the national and international consumption markets is still challenging. The aim of this research is to investigate and identify the effects of marketing mix elements on steel industry export. To this end, a case study conducted on export of Iran's steel products in the trading-industry marketing views. According to the marketing mix elements approach, 30 variables were studied. In this research the quantitative descriptive-analytic method was used to collect and analyse data. All data obtained using questionnaires. Findings and results show that the price element is the highest priority amongst other marketing mix elements.

Keywords: Marketing Mix Elements, Trading-Industry Marketing, Steel Industry.
JEL Classification: M10, M16, M30, M31, C12, C13, C15.

1. Introduction

Nowadays, Iran seeks to move away from the mono product economy based on petroleum as this type of economy is unstable. The country

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has potential to move toward the none-oil economy and reach to the superior economic position in the Middle East because of the geographical location, mineral resources, fuel energy and inexpensive human resources to name a few (Pourmoghim, 2004). To this end, the country attempts to invest in other mineral industries such as steel manufacturing and its subsets not only for the national demand but also for the international trade. Currently, export of Iran's steel products to the other countries is not considerable and has the trifle export value. Hence, a key role of marketing in this industry can be observed (Economic Studies Department, 2006).

Economists believe that marketing factors would influence on competition and presence in global markets. Hence, the use of marketing methods is required for these products (Mirabi & Sarmad, 2003). Literature review shows that research has been done to assess competitive advantages of steel production in Iran and possibility of the international export using the Porter's model. It also shows that there is no study to explore the role of influenced mix marketing factors on Iran's steel products export. This research attempts to investigate the role of marketing mix elements on the Iran's steel export using the quantitative descriptive-analytic approach. Finally, it suggests a novel strategic management view to improve Iran's steel trade as it is a hot topic amongst the Iranian steel manufacturers.

The remainder of this paper is organised as follows. Section 2 briefly describes the four elements of marketing mix. An overview on global crude steel production is explained in Section 3.Section 4 reviews developments of the steel industry in Iran. Section 5 discusses a case study to identify the most effective marketing mix elements on Iran's steel export. The quantitative descriptive-analytic approach and statistical tools are used to collect and analyse data. The discussion and conclusion are given in Section 6.

2. Marketing Mix Elements

Marketing can be defined as series of activities to promote and sell products and/or services to gain profit (Amit & Zott, 2001). Marketing activities concentrate on organization efforts to satisfy needs and desires of customers by offering competitive valuable products and services (Barney, 2001). The aim of marketing is to create value for

beneficiary individuals and groups whom are the most important customers (JafarNejad, 2006). In general, there are four marketing mix elements which impact on the sale rate and producer success in competitive markets (Hakkak & Ghodsi, 2015). Figure1 illustrates these four marketing mix elements.

Figure 1: Marketing Mix Elements

- **Product** consists of themes such as product varieties, quality, design, specifications, trade mark, size, packing, warranty, service and efficiency (Haghighi, 2009);
- **Price** consists of themes such as discount, price list, credits, payback period and conditions (Kotler & Armstrong, 2010);
- **Place** consists of themes such as distribution channels, market coverage, inventory, shipping and distribution place (Kotler & Armstrong, 2010);
- **Promotion** consists of themes such as advertisement, personal selling, public relations, and direct marketing (Kotler & Armstrong, 2010).

Product consists of physical, service and symbolic specifications to comply purchasers and consumers needs and desires. Product is the most significant element of marketing mix as firms' celebrity is based on their products (Keegan, 1989).Price is the most sensitive element of marketing mix and it entails of money that customers pay for delivered products. Pricing a product is the only element in marketing mix that creates income whereas the other elements are costly (Haghighi, 2009). Strategic pricing is a new subject in marketing mix

management. In past, the financial and accounting department of a firm was responsible for pricing a product based on internal costs, revenue and profits. Nowadays, pricing a product is determined in the marketing department of a firm in order to achieve the firm's trade visions (Mirabi & Sarmad, 2003).

In general, pricing a product can be decided according to: (1) production costs; (2) competitor's price for similar products; and (3) currency fluctuations. The first and second factors define the lowest and highest price bands. The third factor has direct correlations with changes in local prices (Haffman, 2005). Place transmits a product from a producer to a consumer by distributors through distribution channels. There is a belief that distributors cause price increased and their role is not essential in marketing mix. But the truth is by removing the distributors' role; the distribution cost could not decrease (Keegan, 1989). Promotion involves a group of advertising, sales and public relations to achieve supper aims of sales (Kotler & Armstrong, 2010).

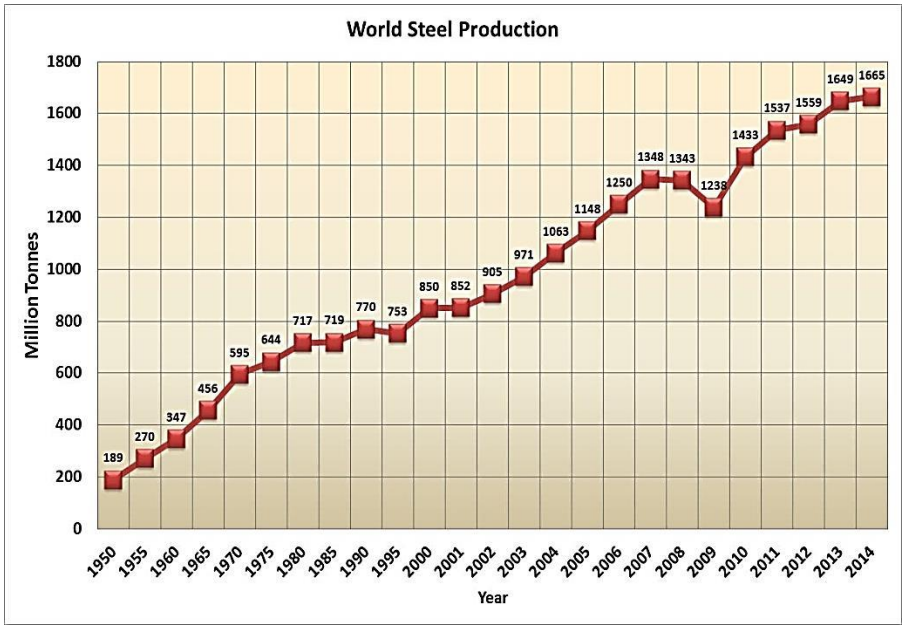
3. Overview on Global Steel Production

As it can be seen in Figure 2, the trend of steel production is globally increasing since 1950.In spite of this increase; the climate change is a significant challenge for the steel industry in the21stcentury. The World Steel Association encourages worldwide steel manufacturers to participate in the (Basson, 2015) climate change action programme for collecting and reporting on CO2 emissions using the agreed methodology to improve the environmental performance of steel plants around the globe (ISO 14404: 2013). As a result of this climate change programme, the rate of steel production has increased slightly in the world (Basson, 2015).

According to a census in 2001, Russia and Japan were the world largest steel exporters with 6.25 and 5.29 million tonnes in this year. On the other hand, United States and China have been the world largest steel importers with 8.27 and 6.25 million tonnes in 2001. China was known as the world largest steel manufacturer with 9.15 million tonnes in this year. In addition, United States was known as the world third largest steel manufacturer with 9.10 million tonnes in 2001. It can be seen that while China and United States were the

largest steel manufacturers in the world, their production has not been adequate for their national consumptions.

Figure 2: World Steel Production Growth



Figures 3 and 4 illustrate the crude steel production and steel use in finished steel products at eight regions (i.e. China, Japan, North American Free Trade Agreement (NAFTA), European Union (EU), Commonwealth of Independent States (CIS), other Asia, other Europe and others (Economic Studies Department, 2006).

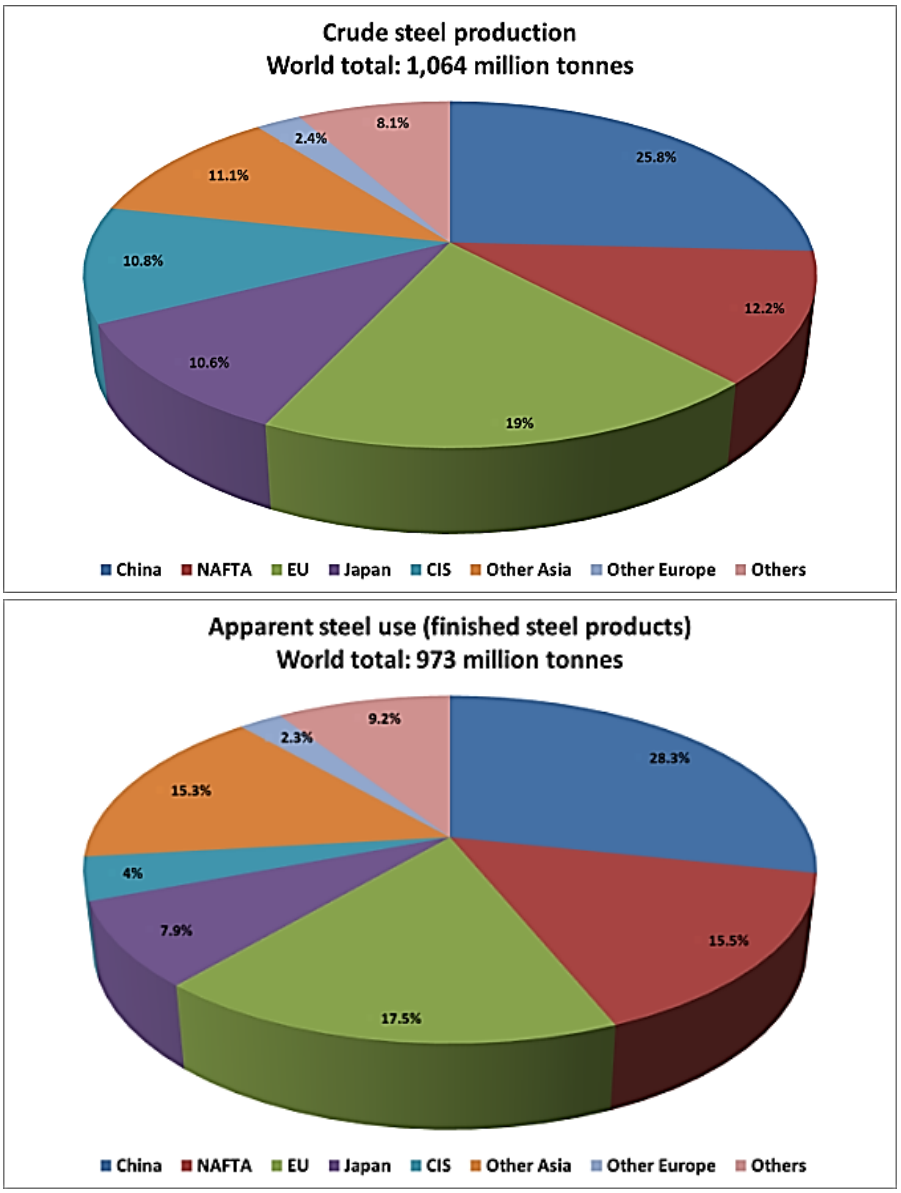


Figure 3: Steel Production and Use in 2004 at Eight Geographical Zones

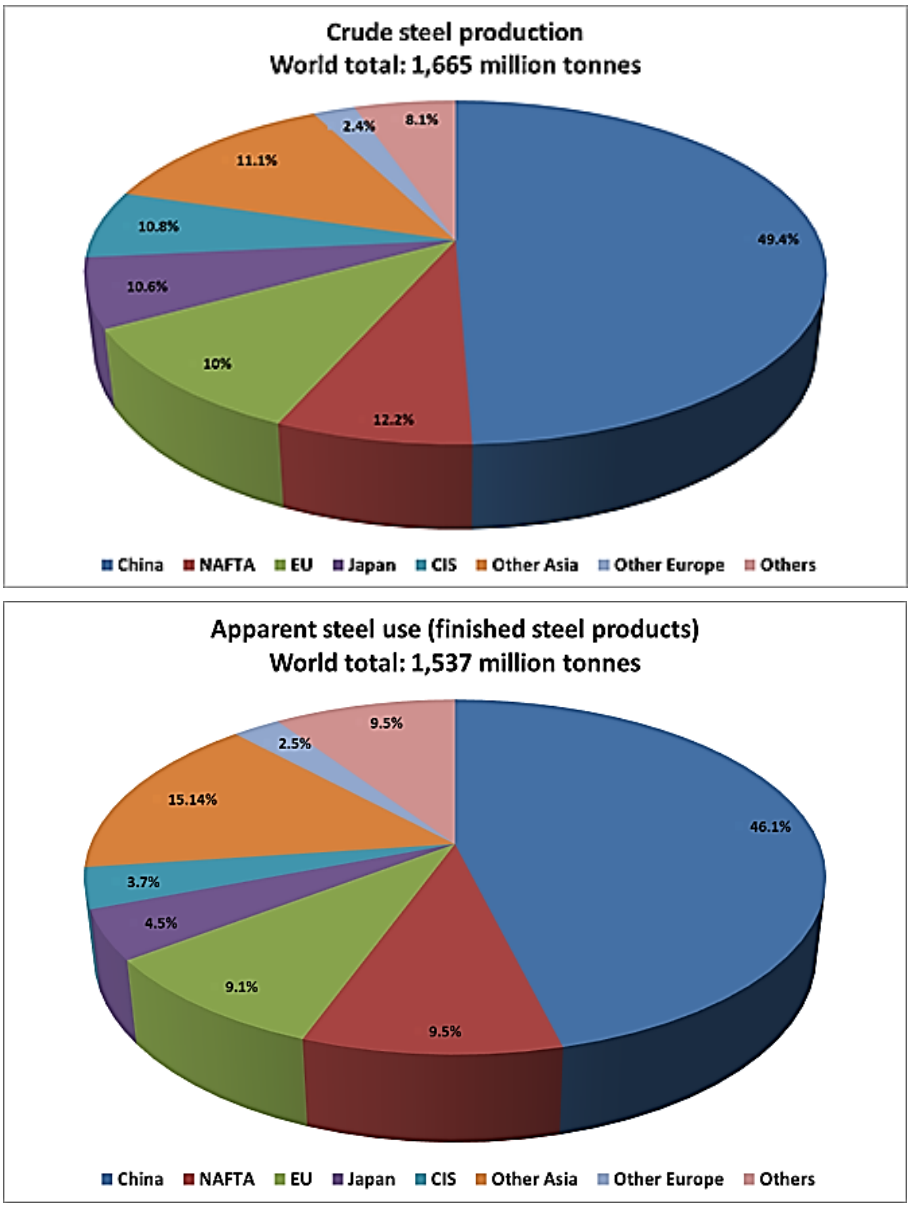


Figure 4: Steel Production and Use in 2014 at Eight Geographical Zones

4. Overview on Iran's Steel Production

Due to the economic improvement and increased steel demand in Iran, the first attempt to establish an iron and steel complex was at 1930. A German firm cooperation leaded a large project to build the iron and steel complex for the Iranian National Steel Industries Group (INSIG) but it was postponed due to the World War II. After that, the

government of Iran and INSIG signed a contract with Soviet Union to trade and exchange natural gas with heavy industrial machineries and technologies including construction of a steel plant with the annual production capacity of 550,000 tonnes. Finally, this plant built in 1971. Then, another contract signed with Soviet Union to increase the annual production capacity of the plant to 1.9 million tonnes. At present, Iran is the largest manufacturer of steel products at the Middle East (Zahed Talaban & Tavasoli, 1998). Iran was in the rank of 26 amongst the largest steel manufacturers in the world from 1999 to 2000.

Amongst developing countries, Iran produced 6.9 million tonnes steel in 2001; whereas, it could only export 600 thousand tonnes in that year. Iran imported 4.7 million tonnes of steel in the same year which put this country in rank of 17 among other steel importer countries in the world. According to the Iranian Mines and Mining Industries Development and Renovation Organization report, the total steel production was 14.42 million tonnes in 2014. Therefore, anticipation of steel export was increased and expected to be 9.2 million tonnes in 2015. Literature shows that the portion of steel products' export is higher than crude steel's export in Iran (Zahed Talaban & Tavasoli, 1998). On the other hand, the import of crude steel and steel products has been increased but the portion of steel weaknesses to achieve the anticipated visions in the steel industry. One of the significant elements affecting the cost of crude steel and steel products is energy and fuel resources used in manufacturing and production processes (Ebadi & Mousavi Madani, 2006). It is remarkable that Iran is one of the largest oil and gas resources in the world. In addition, Iran has a great amount of iron ore and other mineral resources (e.g. coking and metallurgical coal) required in steel manufacturing (Economic Studies Department, 2006). On the other hand, Iran does not have sufficient technical and engineering skills for steel manufacturing. While the labour cost is low, the labour productivity is low (Afshari & Sheibani, 2004). Moreover, Iran does not have the appropriate and efficient transportation systems and also the transportation cost is not cheap in Iran. The other drawback is Iran does not have appropriate production management systems. Furthermore, Iran does not have sophisticated and high-tech production machineries required in steel manufacturing to increase

productivity and production rate and decrease production costs. The other disadvantage is the government of Iran controls economics and markets (Pourkazemi, Sherafat, & Delfan Azar, 2015). Finally, Iran is one of the high risk investment countries and this issue impacts on any industries like the steel industry (Amiran, Radfar, & Zolfani, 2011).

5. Case Study Methodology

This case study conducted based on the quantitative descriptive-analytic approach for data collection and data analysis. This approach describes and interprets the existing situations on conditions, relations, common beliefs, processes, evidences, effects and trends. This method primarily investigates about current situations although past events that are relevant to the current situations would be investigated (Sarmad, Bazargan, & Hejazi, 2006). The descriptive approach is promising to explain and describe the impact of marketing mix elements on Iran's steel exports. Descriptive statistics used for the statistical analysis in this study. The statistical population of this study consisted of marketing managers and external commercial managers, who were expert in the field of steel exports as well as four marketing mix elements. The target statistical population for data collection was included marketing managers and external commercial managers in 30 Iranian steel manufacturing firms. Out of total 180 questionnaires sent to these potential respondents, 30 questionnaires were received back in time of processing. The response rate was therefore more than ten percent which is an acceptable return rate for this type of questionnaire survey. Data collection, statistical data analysis and final results of this case study are shown in this section.

5.1 Data Collection and Analysis

Extensive studies have been done to design and compile the data collection tool (i.e. questionnaires) according to the existing literatures and expert knowledge in this field. The questionnaires developed based on the theory of marketing mix elements with a focus on elements of product, price, place and promotion. The questionnairesincluded30 questions with five choices that measured according to the Likert scale from very high to very low (i.e. very high=5, high=4, average=3, low=2 and very low=1). In order to determine the reliability and validity of the data collection tool,

the Cronbach's alpha value calculated. The Cronbach's alpha value is given by $\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}^2}{\sigma_X^2}\right)$ where, K is the number of questions; $\sigma_{Y_i}^2$ is the variance of i[th] question of the sample; and σ_X^2 is the variance of the observed total test scores.The estimated Cronbach's alpha is0.89 which shows the significant correlations amongst these questions (Behboodian, 2001). In general, the data collection tool can be validated and accepted if the range of Cronbach's alpha is between 0.7 and 1.

Data obtained through the questionnaires analysed using the analytical and statistical methods. MATLAB and SPSS statistics software applied for the frequency distribution, central tendency, statistical dispersion and other statistical analysis in this case study. Furthermore, the Chi-squared test, Pearson correlation coefficient test and one-sample t-test implemented to determine the impact of each element of the marketing mix in Iran's steel exports. In addition, the Friedman test used to compare the priority and perception of these components.

5.2 Results

The frequency distribution of marketing mix elements on Iran's steel export based on the results of questionnaires are summarised in Table 1.

Table 1: Frequency Distribution of Marketing Mix Elements on Iran's Steel Export Using the Likert Scale Approach

Marketing mix elements		Very high	High	Average	Low	Very low
Price	Frequency	10	18	2	0	0
	Percentage	33.3	60	6.7	0	0
	Frequency					
Place	Frequency	6	23	0	1	0
	Percentage	20	76.6	0	3.4	0
	Frequency					
Product	Frequency	7	14	7	2	0
	Percentage	23.3	46.7	23. 3	6.7	0
	Frequency					
Promotion	Frequency	1	9	15	4	1
	Percentage	3.3	30	50	13.4	3.3
	Frequency					

As it can be seen in Table 1, the statistical results illustrate that the price of finished steel products would have the high influence in international marketing of Iran's steel export. 33.3% and 60% of the statistical population believed on very high and high impacts of this marketing mix factor in the competitive global steel markets. The table's information depicts that the distribution channels have the high

impact in marketing of Iran's steel export. 76.6% and 20% of the population believed on high and very high impacts and roles of this marketing mix element. In addition, the results show that the impact of Iran's steel products in terms of the quality, design and diversity on international markets is high (i.e. 46.7%). 23.3% of the statistical population stated that the product could be a very high and/or average element of marketing mix in Iran's steel export. On the other hand, 6.7% of this population believed that this marketing mix element has only the low effect on Iran's steel export. The descriptive statistical analysis on promotion activities describes that 3.3% of the population in this study expressed on the very high role of this marketing mix element on the Iran's steel trade. 30% of them believed that promotion has the high impact on Iran's steel export. On the other hand, 3.3% and 50% of the statistical population stated very low and average effects of this marketing mix element in steel export of Iran.

In this section, to conduct further assessment on impacts of marketing mix elements on Iran's steel export, the other statistical methods such as one-samplet-test, Chi-squared test and Pearson correlation coefficient test are applied and results are shown in Tables 2, 3 and 4. After that, the impacts of the marketing mix elements are prioritised and ranked using the Friedman test and results are shown in Table 5.

Table 2: One-Sample T-Test of Marketing Mix Elements on Iran's Steel Export

Hypothesis	Mean	Standard deviation	t-value	P-value	Test value	Alpha level	Confidence interval	
							Lower limit	Higher limit
Price	4.20	0.76	30.22	0	3	0.05	3.91	4.48
Place	4.10	0.59	28.54	0	3	0.05	3.90	4.30
Product	3.23	0.67	28.08	0	3	0.05	2.97	3.48
Promotion	2.43	0.57	17.22	0	3	0.05	2.14	2.77

As it can be seen in Table 2, the t-value is positive and the P-value is zero and is less than the Alpha level (or statistical significance); therefore, the hypothesis assumption is accepted and it can express the following statements with 95% confident. The three elements of price, place and product in marketing mix have the effective role in steel export of Iran. It is noticeable that the elements of price and place

have the higher impact than the element of product in exporting of Iran's steel. On the other hand, the promotion element has the lower impact in Iran's steel export compared to the other marketing mix elements in this case study.

Tables 3 and 4 illustrate the results of Chi-squared and Pearson correlation coefficient tests. From these results, several remarks are observed about the impacts of marketing mix elements on steel export of Iran. As it can be seen in the Chi-squared test, the P-value of all marketing mix elements is less than the Alpha level; therefore, the hypothesis for influences of these elements on Iran's steel export is accepted. Both Table 3 and 4 results demonstrate that the element of price has the highest chi-squared and correlation coefficient values amongst the other marketing mix elements in Iran steel export. The other three elements of place, product and promotion follow the price element, accordingly.

Table 3: Chi-Squared Test of Marketing Mix Elements on Iran's Steel Export

Hypothesis	Chi-squared value	Degree of freedom	P-value	Alpha level
Price	66.33	4	0	0.05
Place	51.00	4	0	0.05
Product	36.33	4	0	0.05
Promotion	25.00	4	0	0.05

Table 4: Pearson Correlation Coefficient Test of Marketing Mix Elements on Iran's Steel Export

Hypothesis	Correlation Coefficient	P-value
Price	0.855	0.0130
Place	0.706	0.0000
Product	0.560	0.0006
Promotion	0.410	0.0120

Table 5: Friedman Test to Prioritise Impacts of Marketing Mix Elements on Iran's Steel Export

Marketing mix elements' impacts on Iran's steel export	Friedman test
The price element role in Iran's steel export	3.39
The place element role in Iran's steel export	3.31
The product element role in Iran's steel export	2.08
The promotion element role in Iran's steel export	1.32

It can be clearly seen in Table 5 that the price element has the highest ranking and the promotion element has the lowest ranking amongst marketing mix elements which impacts on Iran's steel export.

6. Conclusions

Nowadays, countries with the mono product economy based on petroleum explore to move away from this type of economy to the steadier one. Iran is one of these countries that attempts to invest and develop in other mineral industries such as the steel manufacturing for both national demands and international markets. However, in order to be one of the successful suppliers in competitive national and international markets, it is required to understand the four marketing mix elements (i.e. product, price, place and promotion) which impact on the sale rate and producer success in the competitive market. This research on ducted to identify and assess the impacts of these marketing mix elements on steel export of Iran from the commercial and industrial marketing perspective. To this end, the four elements of marketing mix have been identified as hypothesises of this study. Extensive analytical methods in addition to several interviews with senior managers of steel manufacturing firms have been carried out to compare the roles of four marketing mix elements on Iran's steel export.

According to results of this study, the price element has the highest role and influence on export developments of steel products. There would be several reasons behind of the results. The role of the government of Iran in controlling steel industries, uncompetitive suppliers and manufacturers, and costs of finished steel products are few reasons. They originated from other issues such as high overhead costs, inappropriate technologies and optimised production processes, unsuitable production strategies, lack of managerial skills in allocation and utilisation of resources as well as limitations made by the government in steel products' export. Furthermore, this study shows that the distribution system and channel has the second highest role on steel products' export. Generally, a proper system and channel of distribution plays an important role in attracting customers to products through the quick and timely delivery method. Various forms of products have the third rank amongst other marketing mix elements

which can influence on steel export. The element of product includes using the experiences of other global steel manufacturers, the impact of Iran's steel products' appearance, design of Iran's steel products and product varieties in Iran's steel firms. Finally, promotion activities including advertising, personal selling and after-sales service has the lowest role on Iran's steel export.

According to the results of this study, Iran cannot compete with Asian countries such as China and India in steel products' price as the finished products' cost in Iran is higher than those countries. Hence, the direct and essential impact of finished product costs on developments of steel export is a significant message to the steel manufacturers in Iran. It is required to identify the parameters and factors contributed in increasing price and then undertake serious efforts to reduce their increasing impacts on the price. One factor that has a significant role in reducing the cost of finished steel products is resource management through appropriate allocation of resources in the production process. Moreover, possibility of using energy with low price and the advantage of having young and efficient human resources are the other parameters to achieve the price reduction in finished steel products at Iran. The other factor that has an important role in decreasing the cost of finished steel products is using an advanced technology which could result in low energy consumption. As the majority of steel mills in Iran use the traditional technology; therefore, modified, improved and updated production technologies are required. Further study can be carried out to assess and analyse influences of the factors in which contribute on the finished steel product costs in Iran.

References

Afshari, Z., & Sheibani, I. (2004). An Input-Output Assessment of Employment, Efficiency, Income Distribution and Growth Strategies in Iran. *Iranian Economic Review, 9*(10), 5-13.

Amiran, H., Radfar, I., & Zolfani, S. H. (2011). A Fuzzy MCDM Approach for Evaluating Steel Industry Performance Based on Balanced Scorecard: A Case in Iran. *2nd IEEE International Conference, Emergency Management and Management Sciences (ICEMMSI),* Retrieved from http://ieeexplore.ieee.org/abstract/document/6015746/?part=1.

Amit, R., & Zott, C. (2001). Value Creation in E-Business. *Strategic Management Journal, 22*(1), 493–520.

Barney, J. (2001). Resource-Based Theories of Competitive Advantages. *Journal of Management, 27*(6), 643-650.

Basson, E. (2015). World Steel Association. *Online paper*, Retrieved from https://www.worldsteel.org.

Behboodian, J. (2001). *Nonparametric Methods.* Tehran: Payame Noor University Press.

Ebadi, J., & Mousavi Madani, S. (2006). The Economies of Scale in Iran Manufacturing Establishments. *Iranian Economic Review, 11*(15), 143-170.

Ebrahimi, A., Rousta, A., & Venous, D. (2005). *Marketing Management.* Tehran: Samt Publication.

Economic Studies Department (2006). *Investigating of Iran's Steel Market.* Tehran: Iranian Mines Development and Renovation Organization, Retrieved from http://www.fooladtechnic.ir/.

Haffman, N. (2005). An Examination of the Sustained Competitive Advantage. Concept: Past, Present and Future. *Academy of Marketing Science Review, 2000*(4), 1-16.

Haghighi, M. (2009). *International Business.* Tehran: University of Tehran Press.

Hakkak, M., & Ghodsi, M. (2015). Development of a Sustainable Competitive Advantage Model Based on Balanced Scorecard. *International Journal of Asian Social Science , 5*(5), 298-308.

JafarNejad, A. (2006). *Production and Operation Management.* Tehran: Safar-Eshraghi Publication.

Keegan, W. J. (1989). *Global Marketing Management.* New Jersey: Prentice Hall.

Kotler, P., & Armstrong, G. (2010). *Principles of Marketing.* New Jersey: Pearson Education.

Mirabi, V., & Sarmad, S. (2003). *International Marketing in the Third Millenium.* Tehran: Andishehaye-Gohar-Bar Publication.

Pourkazemi, M. H., Sherafat, M. N., & Delfan Azar, Z. (2015). Modeling Iran's Underground Economy: A Fuzzy Logic Approach. *Iranian Economic Review, 19*(1), 91-106.

Pourmoghim, S. J. (2004). The Optimum Level of Non-Oil Exports: A Theatrical Proposal on Irans Case. *Iranian Economic Review, 9*(10), 89-101.

Sarmad, Z., Bazargan, A., & Hejazi, E. (2006). *Research Methodology in the Field of Behaviour Science.* Tehran: Agah Publication.

Zahed-Talaban, A., & Tavasoli, M. (1998). Analysis of the Production and Consumption of Steel. *Journal of TE (JTE), 50*(1), 83-104.