

## **AN ANALYSIS OF FACTORS INFLUENCING EXPORT COMPETITIVENESS IN AMBALA'S SCIENTIFIC INSTRUMENTS SECTOR**

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### **ABSTRACT**

The growth rate of an economy is directly related to exports. If exports increase at a faster rate as compared to imports, nothing can stop an economy to be a developed one. India's economy has performed well in recent years after the country began to open in 1991. This research paper will be a yard stick for the scientific instruments exports enterprises in order to identify the important determinants of their export competitiveness. The scientific instruments industry of Ambala Cluster is taken as sample of the research study. Factor conditions, demand conditions, firm strategy, firm's structure and rivalry, related and supporting industries and government are considered the determinants of this study. All the Variables of export competitiveness have positive impact on the export competitiveness. This study suggests the various strategies and advantages of competitiveness in the exports of scientific instruments. This paper is an attempt to develop a model in order to answer the research questions based on growth of exports and economic performance of scientific instruments industry in India. The findings of the study will provide an insight for improving the competitive structure of the export clusters in developing countries like India.

**Key Words:** Export Competitiveness, Growth of Export, Export Clusters.

### **INTRODUCTION**

Foreign Trade is very crucial for a country's economic development as it has made an increasingly significant contribution to economic growth and substantially to the economic welfare of the people. The foreign trade of a country consists of inward and outward movement of goods and services, which results into outflow and inflow of foreign exchange from one country to another country. No country in the world possesses the adequate facilities for economical production of all the goods and services that are consumed by its people. This implies that no country is self-sufficient in the sense that no country can produce all the goods that it needs. Hence, the need to trade with each other arises.

Export is an activity of sending goods to another country for sale (Dictionary meaning). The firms can consider export under the circumstances like when the cost of production in the foreign market is high, the volume of sales in the foreign market is not enough to break even point, the foreign market is not a long term market, the product may not have enough life to justify huge direct investments and the political factors are not conducive.

India's economy has performed well in recent years after the country began to open in 1991 and India's position has improved after the inception of the World Trade Organisation (WTO)

also as far as Export of the country is considered. Ambala based ` 1,700 Crore scientific instruments industry has shunned the century-old conventional production methods to adopt automation to remain relevant in the international market and compete with the other countries competitiveness like china. Ambala has over 1,000 micro, small and medium enterprises which are engaged in making scientific instruments. The industry exports instruments worth ` 500 crore. The sector directly employs around 30,000 people. The cluster exports instruments to the Gulf, European and the neighboring countries such as Bangladesh, Pakistan and Sri Lanka.

The Ambala cluster is believed to be the largest in the country in manufacturing scientific instruments and apparatus. The products manufactured are used in engineering industry and educational institutions. It was flourishing industrial center until the late 1990s, but the rapid rate of change in the business environment in post-liberalization India growing competition in the international market has jeopardized its future. Over the years, manufacturing activity in cluster has declined in the absence of technology up-gradation. The potential to yield annual sales revenue of ` 10,000 crore, but is doing business of only about ` 1,000 crore.

## REVIEW OF LITERATURE

Export competitiveness has been found a significant area in modern research, number of research studies has been done on the performance of exports of different industries but competitiveness of export is a major concerned for the industries due to an edge in global competition. Some research studies are discussed as below.

**Hawkins and Meindertsma (2004)** studied that competitiveness as the ability of a country to increase its share of domestic and export markets where a country has a comparative advantage in a product when it can produce at a lower opportunity cost than other countries.

**Lamo (2005)** conducted a research on Export Performance Analysis of Agricultural Sector and Industrial Sector that have a comparative advantage and its role in GDP in the province of South Sulawesi. In conclusion the export price positively influence on the increase in the quantity of exports, while higher income of importing countries negatively affect the quantity of exports.

**Paskah Lodowik Samuel (2009)** in his master thesis analyzed the Indonesia's export competitiveness in coconuts the result shows that China is in the first place as the most competitive destination market for Indonesia's coconut products, in China Indonesia has ten products that have positive value on its competitiveness index. Positive value in competitiveness index means that Indonesia has strong competitiveness compare to its competitors in its destination market.

**Yoganandan G, jaganathan A T, R Saravanan and V Senthilkumar (2013)** evaluated the factors affecting export performance of textile industries in developing countries. Most of the researchers found a positive relationship in all the variables and textile exports.

**Rodrigues Gwendolyn and Khan Zeenath (2015)** used Porter's Diamond Model to evaluate and analyze the industrial competitiveness of various South Asian Free Trade Area (SAFTA) countries and compare the factors contributing to their competitiveness in clothing

industry. It is analyzed that India and Sri Lanka rank first for factor conditions whereas Bangladesh and Nepal does not have very supportive factor conditions.

**Inayah Ika, Oktaviani Rina and Daryanto k Heny (2016)** analyzed the export determinants of Indonesian Pepper in the international market. The factors that statistically significant in affecting export demand of Indonesian pepper are the GDP per capita of importing countries, the economic distance, the export price, the real exchange rate and the participation in FTA (Free Trade Agreement) have a negative effect to the export volume of Indonesian pepper.

**Jhamb Priya (2016)** analyzed the sources of competitiveness advantage of sports industry in Jalandhar Cluster. The researcher used Porter's Diamond Model in order to identify the present status of sports goods industry cluster by analyzing the competitiveness with regard to each determinant. It was identified that sports goods cluster of Jalandhar is mainly dependent on factor conditions i.e availability of raw material and skilled labour. Apart from it, the presence of sophisticated customers, suppliers of machinery and competitors enhance the growth of cluster.

## OBJECTIVES OF THE STUDY

1. To evaluate the Current Status of Exports of Scientific Industry in India.
2. To identify the determinants of export competitiveness in scientific export industries in Ambala Cluster.
3. To suggest various strategies to enhance and upgrade the export competitiveness in scientific export industries in Ambala Cluster.

## HYPOTHESES OF THE STUDY

Hypotheses are developed to test the impact of independent variables on dependent variable. According to the model, the following research hypotheses are defined;

H1: The factor conditions have a positive effect on the export competitiveness of scientific instruments export industry.

H2: The demand conditions have a positive effect on the export competitiveness of scientific instruments export industry.

H3: The related and supporting industries have a positive effect on the export competitiveness of scientific instruments export industry.

H4: The government has a positive effect on the export competitiveness of scientific instruments export industry.

H5: The brand loyalty has a positive effect on the export competitiveness scientific instruments export industry.

The above research hypothesis will be tested to examine the export competitiveness in selected scientific instruments export industries.

## SIGNIFICANCE OF THE STUDY

The study is an attempt to develop a model in order to answer the research questions, what are the determinants of export competitiveness of scientific instruments industry in India by drawing attention on Porter's theory of the competitive advantage of nations. The framework of this study will help policy makers and industry associations to assess their export competitiveness. Within the era of growing trade liberalization, it is very important to assess export competitiveness of an industry. Assessing export competitiveness of an industry is a broader concept to study. There are various export clusters of scientific instrument industries in India like Ambala, Delhi, Bangalore, Mumbai and Kolkata. In these clusters Ambala cluster of scientific instrument export industry is comparatively the largest one.

## RESEARCH METHODOLOGY

This research narrow-down its scope on scientific instruments industry which plays a significant role in Ambala Cluster as well as in Indian economy. Therefore, this paper tried to identify the determinants of export competitiveness of firms which are engaging in scientific manufacturing and exporting in Ambala Cluster, which is one of the major cluster in India.

A nation's success in a particular industry is driven by four interrelated determinants, namely; Factor Conditions, Demand Conditions, Firm Strategy, Structure and Rivalry, and related and supporting industries. The model also suggested that the government should act as a challenger for industry to aspire higher level of competitive performance.

Variables related to factor conditions, demand conditions, firm strategy, firm's structure and rivalry, related and supporting industries and government are considered as determinants of the study. Scientific Instruments industries are taken as the unit of study and top-level managers of the companies are considered as the respondents of the survey. Total 120 selected companies in India involved in exports of scientific instruments are selected as sample.

The pilot survey was conducted using questionnaires. The first part of the questionnaire gathered information about the organization's background. The second part of the questionnaire consist the information related to export competitiveness determinants. Last part of the questionnaire consisted with an open ended question which included for the purpose to identify the identical factors that could gain competitive advantage to the scientific instrument industry in India.

## DATA ANALYSIS AND RESULT DISCUSSION

Export of optical medical, surgical and scientific instruments in India show the following trends during the period 2015-2018 as;

**Export of Scientific Instruments Commodities (Values in US\$ Million)**

Commodity	April-March 2015-2016	April-March 2016-2017	April-October 2016-2017	April-October 2017-2018 (P)	% Growth	% Share

Optical, Medical & Surgical Instruments	1,635.07	1,889.58	1,069.47	1,247.00	16.6	0.74
Surgical	302.88	333.36	193.84	211.68	9.21	0.12
Optical Items (Incl. Lens etc.)	342.96	379.53	214.82	262.3	22.1	0.15
Medical & Scientific Instrument.	989.24	1,176.69	660.81	773.02	16.98	0.46

Data Source: Annual Report 2017-18, Ministry of Commerce & Industry, pp. 37

During the period 2017-18 (Apr-Oct), export of Optical, Medical & Surgical Instruments increased to US\$ 1,247.00 million compared to US\$ 1,069.47 million in the corresponding period of the previous year registering a positive growth of 16.60 %.

Factor analysis is performed to identify the determinants of export competitiveness using forty eight variables in the questionnaire. Factor analysis is used by applying Kaiser-Myer-Oklings (KMO) test in SPSS version-16. KMO of sampling adequacy is examined the appropriateness of the factor analysis. Determinants of export competitiveness of scientific instruments industry in India are considered one dependant variable and five independent variables.

### **Construct-Endogenous**

Export Competitiveness (EC) - 3 items

### **Drive Construct-Exogenous**

Factor conditions (FC) - 6 items

Demand Conditions (DC) - 3 items

Related and Supporting Industries (RS) - 3 items

Government (Govt) – 3 items

Brand Loyalty (BL) - 3 items

In this study fifty variables are included to measure the eighteen elements and six determinants. The exploratory factor analysis is performed to identify the composite reliability of the construct. Table -2 shows the coronbach's alpha for all constructs is evaluated the criterion standard. The factor structure of the constructs shows a satisfactory degree of dimensionality and reliability.

**Table-2: Composite Reliability Statistics Results**

Commodity	Average Variance Extracted (AVE)	Composite Reliability	R Square	Cronbach's Alpha	Communality	Redundancy
BL	0.86 38	0.8876	0.857	0.8045	0.8235	0.217
DC	0.83 13	0.8758		0.7989	0.8054	
EC	0.84 77	0.8284		0.8123	0.8377	
FC	0.75 85	0.8386		0.8895	0.8898	
GOVT	0.83 86	0.8844		0.8223	0.8123	
RS	0.79 79	0.8774		0.7765	0.7874	

The Average Variance Extracted (AVE) of the entire first construct should be equal or greater than 0.5, as shows in the table-2, AVE values of all the construct are more than 0.5, so demonstrating convergent validity for all six construct. R square value specified that there is nearly 86% on all the determinants of export competitiveness of scientific instruments industry in India.

### **Affect of Factor Conditions on Scientific Instruments Export Competitiveness**

The first Hypotheses (H1) affect of factor conditions on scientific Instruments export competitiveness have positive affect on the export competitiveness of scientific Instruments industry in India the hypotheses is tested by using significant of path coefficient out and regression analysis.

**Table-2.1: Affect of Factor Conditions on Scientific Instruments Export Competitiveness**

Variables	Path Coefficient	t-value	P-value
Export competitiveness	0.2198	7.3852	0.000
Factor Conditions	Standard deviation= 0.378		

Table-2.1 shows that P-value is less than 0.05 and t-value is higher than 1.96. Path coefficient reveals that factor conditions can make an approximately 22 percent impact on export competitiveness. There is a significant and positive affect of factor conditions towards scientific export competitiveness in India. Thus first Hypotheses (H1) is accepted.

### **AFFECT OF DEMAND CONDITIONS ON SCIENTIFIC INSTRUMENTS EXPORT COMPETITIVENESS**

The Second Hypotheses (H2) affect of Demand Conditions on scientific Instruments export competitiveness have positive affect on the export competitiveness of scientific Instruments

industry in India the hypotheses is tested by using significant of path coefficient out and regression analysis

**Table-2.2: Affect of Demand Conditions on Scientific Instruments Export Competitiveness**

Variables	Path Coefficient	t-value	P-value
Export competitiveness	0.1656	4.8657	0.003
Demand Conditions	Standard deviation= 0.0356		

Table-2.2 shows that P-value is less than 0.05 and t-value is higher than 1.96. Path coefficient reveals that Demand conditions can make an approximately 17 percent impact on export competitiveness. There is a significant and positive affect of Demand Conditions towards scientific Instruments export competitiveness in India. Thus second Hypotheses (H2) is accepted.

#### **Affect of Related and Supporting Industries on Scientific Instruments Export Competitiveness**

The Third Hypotheses (H3) affect of Related and Supporting Industries on scientific Instruments export competitiveness have positive affect on the export competitiveness of scientific Instruments industry in India the hypotheses is tested by using significant of path coefficient out and regression analysis

**Table-2.3: Affect of Related and Supporting Industries on Scientific Instruments Export Competitiveness**

Variables	Path Coefficient	t-value	P-value
Export competitiveness	0.1501	4.5437	0.012
Related and Supporting Industries	Standard deviation= 0.0351		

Table-2.3 shows that P-value is less than 0.05 and t-value is higher than 1.96. Path coefficient reveals that Related and Supporting Industries on Scientific Instruments Export Competitiveness can make an approximately 15 percent impact on export competitiveness. There is a significant and positive affect of Related and Supporting Industries towards scientific Instruments export competitiveness in India. Thus third Hypotheses (H3) is accepted.

#### **Affect of Government Support on Scientific Instruments Export Competitiveness**

The Fourth Hypotheses (H4) affect of Government Support on scientific Instruments export competitiveness have positive affect on the export competitiveness of scientific Instruments industry in India the hypotheses is tested by using significant of path coefficient out and regression analysis

**Table-2.4: Affect of Government Support on Scientific Instruments Export Competitiveness**

Variables	Path Coefficient	t-value	P-value
Export competitiveness Government Support	0.2679 Standard deviation= 0.0378	7.0289	0.000

Table-2.4 shows that P-value is less than 0.05 and t-value is higher than 1.96. Path coefficient reveals that Government Support on Scientific Instruments Export Competitiveness can make an approximately 27 percent impact on export competitiveness. There is a significant and positive affect of Government Support towards scientific Instruments export competitiveness in India. Thus fourth Hypotheses (H4) is accepted.

#### **Affect of Brand Loyalty on Scientific Instruments Export Competitiveness**

The Fifth Hypotheses (H5) affect of Brand Loyalty on scientific Instruments export competitiveness have positive affect on the export competitiveness of scientific industry in India the hypotheses is tested by using significant of path coefficient out and regression analysis

**Table-2.5: Affect of Brand Loyalty on Scientific Instruments Export Competitiveness**

Variables	Path Coefficient	t-value	P-value
Export competitiveness Government Support	0.1768 Standard deviation= 0.0433	4.0165	0.010

Table-2.5 shows that P-value is less than 0.05 and t-value is higher than 1.96. Path coefficient reveals that Brand Loyalty on Scientific Instruments Export Competitiveness can make an approximately 18 percent impact on export competitiveness. There is a significant and positive affect of Brand Loyalty towards scientific Instruments export competitiveness in India. Thus fourth Hypotheses (H5) is accepted.

#### **CONCLUSION**

This paper integrates perspectives from export competitiveness, the resource based view of the firm, local and foreign demand conditions of the firm, association with related and supporting industries, government sources and brand loyalty. Supported by the empirical evidences this study found out that factor conditions have the most significant influence of export competitiveness of scientific instrument industry and the second important is government support. Followed by government support, demand condition and brand loyalty have also made positive impact on export competitiveness of scientific instruments industry in India.

The findings of the paper suggests that in order to grow up the export competitiveness in Ambala Cluster of scientific instruments industries must be careful about their factor conditions as well as government policies. The government must also give special care to the scientific instruments industry in India through favorable measures of Export Policy. The

Ambala Cluster of Scientific instruments export industry has to draw a focus on improved factors to get the advantages of export competitiveness.

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