An Analysis Of Export Competitiveness With Special Reference To Machine Exports

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ABSTRACT

This research examines the key drivers of export competitiveness in the machinery industry, with emphasis on improving performance in overseas markets. Employing primary and secondary data, it establishes production costs, technological innovation, trade policy, and international demand as key drivers of competitiveness. The study comprises survey-based analysis of 122 respondents from the machinery sector and uses statistical means such as ANOVA, chi-square and regression to decipher the critical findings. Insights indicate that although digitalization and automation are at the forefront of priorities, cost efficiency is equally a high priority, while innovation especially in product customization and customer service remains untapped. Yet, strong statistical associations between digital strategies and competitiveness measures were relatively non-existent, which suggests a gap in implementation effectiveness. The research ends with practical recommendations for policymakers and companies to use technology, digital tools, and R&D to enhance their global positioning and maintain growth in an increasingly competitive world of exports.

Key words: Export Competitiveness, Machinery Exports, Export Strategy, Cost efficiency, Innovation and Technology

INTRODUCTION

Export competitiveness is a vital determinant of economic growth in a nation, defining its capability to maintain and increase its share in global markets. It captures the effectiveness, quality, and pricing of products relative to international rivals. Improved export competitiveness translates into greater revenues, more jobs, and technology improvement, and thus it is an important driver of sustainable economic development. In amongst export industries, machinery industry stands to contribute massively, as a

consequence of having higher value, more advanced technological intricacy, and far-reaching utilizations in every sector around the globe.

Exports of machinery form a central aspect of global commerce involving wide diversifications like industrial machines, building and road equipment, and precision devices. Economies well equipped in the domain of engineering, powerful infrastructure of manufacture, and scientifically competitive industries typically corner the market globally in the segment of machinery. Germany, China, Japan, and the United States are some of the top exporters in this industry, taking advantage of their superior technology, skilled human resources, and well-developed supply chains. These countries continuously invest in research and development (R&D) to ensure they retain their competitive advantage.

Production costs, technological innovation, trade policies, and exchange rate movements are some of the factors that impact the competitiveness of machine exports. Competitive prices, quality standards, and logistics are important factors in deciding the success of machine exports to foreign markets. Moreover, positive trade agreements and government policies favoring the manufacturing industry also help a country compete in the global market. On the other hand, high costs of production, regulatory restrictions, and a lack of innovation can discourage a nation from exporting.

In spite of the opportunities, machine exporters are confronted with various challenges to remain competitive. Increased raw material prices, supply chain disruptions, and geopolitics may affect production and trade efficiency. In addition, growing competition from emerging markets in Asia, where economies are generally moving up the value chain, increases pressure on incumbent exporters to upgrade their products relentlessly and minimize costs. The transition towards automation and intelligent manufacturing also necessitates businesses investing in digital transformation in order to stay relevant in the new market scenario.

This report examines the most important determinants of export competitiveness, with specific reference to machine exports. It looks at world trends, issues, and policies that nations and firms can implement to improve their standing in the international machinery trade. By knowing these dynamics, policymakers and firms can formulate effective strategies to improve their competitive edge and promote sustainable growth in the industry.

STATEMENT OF PROBLEM

The export of machinery is a critical sector for industrial growth, with competitiveness influenced by factors such as pricing, quality, innovation, trade policies, and supply chain efficiency. A company engaged in machine exports, faces several challenges in sustaining and expanding its international market share.

A prominent manufacturer of machinery, aims to enhance its export competitiveness in the global market. Despite its strong domestic presence, the company faces challenges in increasing its export share, particularly in the machine exports segment. The company's export growth has been sluggish, and it struggles to compete with international players in terms of price, quality, and delivery.

This study seeks to address the following key questions:

1. What are the key factors influencing the export competitiveness in the machinery sector?

2. What role does innovation and technology play in enhancing the company's export competitiveness?

OBJECTIVES

1. To identify the key factors influencing export competitiveness in the machinery sector.

2. To develop strategies to enhance export competitiveness in the machinery sector.

3. To develop strategies for companies to leverage innovation and technology to enhance their export competitiveness.

NEED OF THE STUDY

Competitiveness of exports is the most important driving force for economic development, employment creation, and industrial growth. As the global economy becomes more interdependent, identifying the elements that promote or reduce a nation's capacity for machinery exports is fundamental. Export of machinery drives technological progress, added value, and trade equilibrium. Nevertheless, there are limiting factors such as competitiveness in costs, trade measures, technological advance, and transnational demand cycles. This research is crucial to determine strengths, weaknesses, and opportunities in machine exports to enable policymakers and firms to formulate strategies to improve global competitiveness and sustainable growth.

SCOPE OF THE STUDY

The study scrutinizes machine export competitiveness based on important determinants like efficiency in production, cost competitiveness, trade policies, international demand, and technology. The study takes into account trends in machine exports, comparison of performance with the best competitors, identification of challenges and opportunities within the industry, examination of the influence of exchange rates, tariffs, and supply chain conditions on export performance. The results will be useful to policymakers, exporters,

and industries to develop policies that increase international competitiveness, boost trade balance, and propel sustainable industrial development.

RESEARCH METHODOLOGY

Research methodology is a systematic approach used to collect, analyse, and interpret data for a study. It ensures that the research follows a structured and organized process to achieve its objectives.

RESEARCH DESIGN

This study adopts a descriptive research design to analyze export competitiveness in the machinery sector. Data was collected using a structured questionnaire from a randomly selected sample of 122 employees. Both primary data and secondary data were used. Descriptive statistics and analytical tools like SPSS and Excel were applied for data interpretation. The findings aim to highlight key competitiveness factors and suggest improvement strategies.

SOURCE OF DATA

The Primary and Secondary data I have used in the study is:

❖ Primary data is a well-structured questionnaire, which was prepared and distributed to the employees of the company to gather first-hand information.

❖ Secondary data have been collected from different sources such as publications and research reports, books journals articles, etc.

SAMPLE SIZE

The size of the sample is limited to 122 respondents.

TOOLS AND TECHNIQUES

Some of the statistical tools that are used with the help of SPSS as technique:

❖ ANOVA

❖ Chi-square

❖ Regression

LIMITATIONS OF THE STUDY

- The research may focus on specific types of machinery, potentially overlooking variations in competitiveness across different sub-sectors.

- External factors such as trade policies, currency fluctuations, and geopolitical tensions may influence export competitiveness but are difficult to control within the study.

- The study might generalize findings across firms, while individual company strategies, technologies, and management practices could significantly impact competitiveness.

- Export competitiveness is influenced by multiple qualitative and quantitative factors, making it challenging to develop a universally accepted measurement framework.

- The research might focus on a limited number of countries, making it difficult to generalize findings to a global context.

REVIEW OF LITERATURE

1. **Genhua Hu, Xuejian Zhang, and Tingting Zhu (2024)** "The Impact of Technological Innovation on Export Competitiveness" Scholarship on export competitiveness and technological innovation emphasizes that technological advancements determine international trade performance. R&D expenditure, patenting, and digitalization boost export quality and market share according to research findings. Schumpeterian models of growth note innovation as one of the factors driving competitive superiority, whereas Porter's theory on competitive advantage posits that technology advancement relates to productivity and distinction. Empirical studies on China indicate that high-tech sectors are supported by the state and innovation policies and have increased exports. Yet, technological dependence and international competition remain issues. This research extends existing work by examining China's high-tech industry with updated data and policy information.

2. **Arjang, Sutrisno(2023)** "Strategies for Improving the Competitiveness of MSMEs through the Utilisation of Information and Communication Technology" This explains the way Information and Communication Technology (ICT) makes Micro, Small, and Medium Enterprises (MSMEs) more competitive. Review addresses the contribution of ICT towards efficiency, reach to markets, branding, and customer interaction. Research indicates that MSMEs using ICT have enhanced business performance, improved productivity, and better customer satisfaction. But ICT adoption is slowed down by limited access, poor infrastructure, and poor digital skills. Resource-Based View (RBV) theory is used to account for how ICT can be a strategic resource to MSMEs. Government and private sector assistance is proposed to support ICT adoption.

3. **Quan Chen, Chun-Hsien Wang & Shi-Zheng Huang (2021)** "Effects of organizational innovation and technological innovation capabilities on firm performance: evidence from firms in China's Pearl River Delta" The review of literature discusses export competitiveness, specifically machine exports, examining trade performance drivers. It identifies the influence of innovation, production efficiency, government policy, and international demand on export success. Different economic models and comparative analyses determine the competitiveness of nations, highlighting productivity, cost leadership, and trade agreements. Market entry barriers, exchange rate fluctuations, and supply chain disruptions are major challenges. The review also addresses measures to improve competitiveness, including technological innovation and strategic alliances. Overall, it presents an overall description of determinants and trends influencing machine export performance in the international market.

DATA ANALYSIS

ANOVA

Anova between age and machinery exports prepare for a future trade changes of the respondents

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.772	4	.443	.220	.927
Within Groups	236.096	117	2.018		
Total	237.869	121			

Source: Primary Data

INTERPRETATION

In the above table, the p value is .927 which is than greater than 0.05, so we conclude that there is no significance difference between age and machinery exports prepare for a future trade changes of the respondents.

INFERENCE

Thus, H_0 is accepted & H_1 is rejected.

CHI SQUARE

Comparison between age of the respondents and their views on the influence of machinery export performance.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.386[a]	4	.117
Likelihood Ratio	7.404	4	.116
Linear-by-Linear Association	.002	1	.967
N of Valid Cases	122		

INTERPRETATION

Since the p-values are **greater than 0.05**, there is **no statistically significant relationship** between the variables being tested. The association between the variables is likely due to chance. Additionally, one cell has an expected count less than 5, which may affect the reliability of the results.

INFERENCE

Thus, H_0 is accepted & H_1 is rejected.

REGRESSION

Regression between monthly income and best way to improve labour productivity in machinery exports

- Null Hypothesis (H_0):There is no significant relationship between the monthly income and the best way to improve labour productivity in machinery exports.
- Alternative Hypothesis (H_1): There is a significant relationship between the monthly income and the best way to improve labour productivity in machinery exports.

Model Summary

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Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.032a	.001	-.007	1.421

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.249	1	.249	.123	.726b
	Residual	242.144	120	2.018		
	Total	242.393	121			

Source: Primary Data

INTERPRETATION

The analysis shows that monthly income has no significant impact on the best way to improve labor productivity in machinery exports. The very low R^2 value (0.001) and the high p-value (0.726) from the ANOVA test indicate that monthly income does not explain much of the variation in labor productivity improvement. The coefficient for monthly income is also not statistically significant, suggesting a weak and negligible relationship. Overall, the model fails to demonstrate a meaningful connection between monthly income and the dependent variable.

INFERENCE

Thus**, H_0 is rejected, and H_1 is accepted**

FINDINGS
ANOVA

In the above table, the p value is .927 which is than greater than 0.05, so we conclude that there is no significance difference between age and machinery exports prepare for a future trade changes of the respondents.

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REGRESSION

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SUGGESTIONS

Firms should focus on developing differentiated products for specific export markets and improving post-sale support. These areas can offer a competitive edge, especially where price competition is intense and quality differentiation matters.

Companies should prioritize training, integration, and usability of digital tools to bridge the gap between investment and performance impact. Practical adoption of automation and real-time data tools can still be a game changer.

Given the external risks like geopolitical issues and rising input costs, exporters should diversify their supply sources and invest in local production where possible. Building flexible logistics and strong vendor relationships can reduce disruptions and improve export reliability, directly impacting competitiveness.

Therefore, to enhance export competitiveness in the machinery sector, firms should invest more in innovation and product customization to meet diverse global demands. Effective use of digital tools and automation can significantly improve operational efficiency and reduce costs. Supportive government policies, including incentives for R&D and simplified export procedures, are crucial. Finally, companies must strengthen their market readiness by adapting to global standards, managing supply chain risks, and responding swiftly to international trends.

CONCLUSIONS

The study highlights that export competitiveness in the machinery sector is influenced by multiple interconnected factors such as production efficiency, cost management, innovation, and international market dynamics. While companies recognize the importance of digitalization and automation, the research reveals a gap between adoption and effective implementation, indicating the need for stronger integration strategies. Furthermore, despite the emphasis on innovation, areas like product customization and enhanced customer service remain underutilized.

Statistical analysis, including ANOVA, chi-square, and regression tests, shows that demographic variables like age and income have minimal influence on perceptions of competitiveness or strategies to improve productivity. This suggests that organizational changes and strategic initiatives, rather than individual differences, play a more vital role in enhancing export performance. It reinforces the importance of structured policy and company-wide efforts to address competitiveness.

In conclusion, achieving long-term export competitiveness in the machinery industry requires a balanced focus on innovation, cost efficiency, and strategic international positioning. By addressing both internal inefficiencies and external market challenges, companies can enhance their global relevance. The study's insights provide a roadmap for industries and governments to work together toward a more resilient and competitive export sector.

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