Why China Dominates the Global Table Tennis Equipment Industry: An Economic Analysis of the Competitive Challenges Faced by Indian and European Manufacturers

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Publication Date: 2026/07/22

Abstract: This paper examines why China has become the leading force in the global table tennis equipment industry and why Indian and European manufacturers face difficulty competing with Chinese firms. Table tennis requires a wide range of manufactured products, including blades, rubber sheets, rackets, balls, tables, nets, and training accessories. Over recent decades, Chinese companies such as DHS, Double Fish, Yinhe, Sanwei, and Friendship 729 have developed strong international reputations and have become major suppliers to recreational players, professional athletes, clubs, and tournaments.

The study argues that China's dominance is not explained by low costs alone. It is the result of a closely connected industrial ecosystem built on a large domestic market, economies of scale, specialised manufacturing clusters, integrated supply chains, continuous product development, athlete-led testing, and long-term public support for table tennis as a national sport. WITS trade data for HS 950640, articles and equipment for table tennis, show that China exported approximately US$168.82 million of table tennis equipment in 2024, with the United States, Germany, France, Australia, and South Korea among its largest destinations [11].

European firms such as Butterfly, Donic, Tibhar, JOOLA, and Stiga retain strong positions in premium segments through quality, heritage, and technical design [1, 7]. However, they face higher labour costs, stricter regulatory obligations, smaller domestic markets, and greater dependence on outsourced or specialised component production. India presents a different challenge: despite its large population and rising interest in table tennis, domestic manufacturers remain constrained by fragmented supply chains, limited research and development, weak global brand recognition, and insufficient links with elite players and sporting institutions. The paper concludes that India can improve its competitiveness by developing sports-equipment clusters, investing in research and development, strengthening athlete-manufacturer collaboration, and pursuing an export-oriented manufacturing strategy under broader national manufacturing initiatives.

Keywords: *Table Tennis Equipment, China, India, Europe, Economies of Scale, Industrial Clusters, Comparative Advantage, Sports Manufacturing, International Trade.*

How to Cite: Ayaan Talwar (2026) Why China Dominates the Global Table Tennis Equipment Industry: An Economic Analysis of the Competitive Challenges Faced by Indian and European Manufacturers. *International Journal of Innovative Science and Research Technology*, 11(7), 625-632. https://doi.org/10.38124/ijisrt/26jul157

I. INTRODUCTION

Table tennis is one of the world's most widely played sports and has a large base of recreational and competitive participants. Its equipment industry includes a diverse set of manufactured goods: wooden and composite blades, rubber sheets, assembled rackets, plastic balls, tables, nets, shoes, apparel, robot trainers, and other accessories. As organised leagues, school-level participation, club training, and international competitions expand, demand for high-quality table tennis equipment has also grown. Fortune Business Insights estimates that the global table tennis equipment market was worth approximately US$4.83 billion in 2025 and is likely to continue expanding as participation grows across Asia, Europe, the Americas, and emerging sports markets [4].

Despite the global popularity of table tennis, equipment manufacturing is concentrated in a limited

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jul157

number of economies. China has emerged as the strongest producer and exporter, supported by a large domestic market, deep manufacturing capacity, and a national sporting culture in which table tennis holds exceptional importance. Chinese brands such as DHS, Double Fish, Yinhe, Sanwei, and Friendship 729 supply products across a broad price and performance range, from inexpensive beginner rackets to professional-grade rubbers and blades used by elite athletes.

Historically, European and Japanese companies played a major role in developing modern table tennis equipment. Brands such as Butterfly, Donic, Tibhar, JOOLA, and Stiga built reputations for quality, precision, and technical innovation. However, as production networks shifted toward Asia, China's capacity to combine lower unit costs with increasingly advanced technology altered the competitive structure of the industry. European firms continue to compete in premium niches, but many no longer match Chinese firms in production scale or cost efficiency.

India presents an important contrast. The country has a large population, rising disposable income, and growing participation in table tennis at school, academy, and professional levels. Indian manufacturers such as GKI have long produced table tennis equipment for the domestic market, yet India has not developed global brands comparable to Chinese, Japanese, or European producers [5]. This gap reflects structural constraints, including weaker supply-chain integration, limited sports-equipment research, insufficient export branding, and fewer systematic collaborations between manufacturers and elite athletes.

This paper asks a central economic question: why is China so efficient at producing table tennis equipment, and what prevents European and Indian firms from competing on equal terms? The analysis applies concepts from industrial economics and international trade, including economies of scale, comparative advantage, industrial clustering, production costs, innovation, supply-chain integration, and non-price competition.

➢ *Research Objectives*

The main objective of this paper is to examine the sources of China's competitive advantage in the global table tennis equipment industry and to evaluate the challenges faced by manufacturers in Europe and India. Specifically, the paper aims to:

- Analyse the economic, technological, and institutional factors behind China's leadership in table tennis equipment manufacturing;
- Examine the role of economies of scale, industrial clusters, research and development, government support, and supply-chain efficiency in building Chinese competitiveness;
- Identify the barriers faced by European manufacturers, including high labour costs, regulatory compliance costs, smaller domestic markets, and partial dependence on outsourced production;
- Assess the obstacles restricting Indian manufacturers, especially weak industrial clustering, limited innovation investment, low global brand recognition, and insufficient integration with professional sport;
- Compare the manufacturing ecosystems of China, Europe, and India; and
- Evaluate future competitive possibilities for India and Europe in a market increasingly shaped by innovation, branding, and technology rather than price alone.

II. METHODOLOGY AND SCOPE

This study uses a qualitative case-study approach supported by secondary data. It draws on market reports, company information, institutional websites, trade data, equipment-regulation sources, and examples from the table tennis equipment industry. The trade-data component focuses on HS Code 950640, which covers articles and equipment for table tennis. WITS export data for 2024 are used to illustrate China's export reach and the geographical distribution of demand for Chinese table tennis equipment [6, 11].

The analysis is limited by the availability of detailed firm-level production data. Many manufacturers do not publish output volumes, production costs, research-and-development expenditure, or supplier information. Therefore, the paper avoids unsupported estimates about total global production shares and instead relies on verifiable indicators such as export values, company histories, market reports, and observed patterns in manufacturing organisation.

III. HISTORICAL DEVELOPMENT OF CHINA'S TABLE TENNIS INDUSTRY

China's strength in table tennis equipment manufacturing is closely connected to the cultural and political importance of the sport. Since the 1950s, table tennis has been treated as a symbol of national achievement and international sporting excellence. Public investment in coaching, training halls, schools, professional teams, and competitive structures helped create a large domestic base of players and spectators. This, in turn, generated stable demand for equipment and encouraged the growth of domestic sporting-goods firms.

DHS, associated with Shanghai Double Happiness, is an important example of this historical connection. Founded in 1959, the company grew alongside China's national table tennis programme and became one of the most recognisable suppliers of balls, tables, blades, and rubbers [2]. The relationship between athletes, coaches, and manufacturers created a feedback loop: elite players required better equipment, manufacturers responded with improved designs, and successful Chinese athletes increased the credibility of Chinese-made products.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jul157

This pattern demonstrates how sporting success and industrial capability can reinforce each other.

A strong player base creates demand, demand supports scale, scale supports investment, and investment allows firms to improve quality and technology. Over time, this cycle helped Chinese manufacturers move beyond low-cost production into technologically sophisticated products that compete in professional and premium market segments.

IV. SOURCES OF CHINA'S COMPETITIVE ADVANTAGE

➢ *Economies of Scale*

One of China's most important advantages is its large domestic market. A broad base of school players, club players, professional athletes, and recreational consumers creates continuous demand for balls, rubbers, blades, tables, and accessories. This allows manufacturers to produce in high volumes, spread fixed costs over more units, purchase raw materials in bulk, and operate specialised production lines.

Economies of scale reduce the average cost of production. In table tennis equipment, scale matters because firms must invest in moulds, rubber-compounding processes, quality-control systems, packaging, distribution networks, product testing, and brand marketing. Chinese firms can distribute these costs across large production runs and a wide product portfolio, making it easier to sell both low-cost recreational equipment and higher-end professional products.

➢ *Industrial Clustering*

China's manufacturing advantage also comes from dense industrial clusters. Sports-equipment producers benefit when suppliers, logistics firms, material processors, machinery providers, packaging companies, and distributors operate near one another. Geographic concentration reduces transport costs, shortens lead times, improves access to specialised labour, and allows technical knowledge to spread quickly between firms.

Industrial clustering is especially useful in table tennis equipment because production involves several specialised inputs. Rubbers require chemical formulation and sponge processing; blades require wood selection, bonding, layering, carbon or fibre integration, cutting, sanding, and handle finishing; balls require precision moulding and quality testing; tables require engineered boards, frames, coatings, wheels, and packaging. When these capabilities are located in connected manufacturing regions, firms can respond more quickly to changes in demand and design.

➢ *Research, Development, and Athlete-Led Innovation*

Modern table tennis equipment is technologically complex. Small differences in sponge hardness, rubber grip, blade stiffness, ball roundness, table bounce, and material consistency can affect performance. Chinese manufacturers have improved their competitiveness by investing in product development and by working closely with athletes, coaches, and training institutions.

The DHS Hurricane series illustrates this connection between elite sport and product innovation.

Professional players and coaches provide feedback on spin, speed, control, durability, and feel, allowing manufacturers to adjust materials and production methods. This process helps firms develop equipment that meets high-performance requirements while also building brand credibility among serious players.

➢ *Government Support and Sporting Infrastructure*

Government support has strengthened the wider ecosystem in which Chinese manufacturers operate. Investment in training centres, sports schools, professional leagues, coaching systems, and national-team development increases participation and creates a constant pipeline of skilled players. Although this support is directed primarily at athletic excellence rather than equipment manufacturing alone, it indirectly benefits manufacturers by expanding the market, improving product-testing opportunities, and raising the global visibility of Chinese table tennis.

Public support for sport also increases the symbolic value of table tennis. When Chinese athletes win major tournaments using Chinese equipment, the success functions as a form of non-price competition: consumers associate the equipment with performance, national expertise, and professional credibility.

➢ *Labour Costs, Productivity, and Automation*

Lower labour costs historically helped Chinese manufacturers compete against higher-cost producers in Europe and Japan. However, China's current advantage is not based only on cheap labour. Many firms have adopted automation, precision machinery, and quality-control systems to improve consistency and productivity. Automation is particularly valuable in the production of balls, tables, packaging, and standardised components, while skilled workers remain important in blade finishing, product inspection, and specialist assembly.

This combination of labour availability, technical skill, and mechanised production allows Chinese companies to achieve low unit costs without relying solely on wages. As Chinese wages rise, productivity and supply-chain efficiency become even more important in preserving competitiveness.

➢ *Brand Reputation and Non-Price Competition*

Chinese brands have increasingly competed through reputation as well as price. Sponsorship of professional players, participation in international tournaments, and visible use of Chinese products in high-level competition have increased consumer trust. Brand recognition is especially important in table tennis because players often develop strong preferences for specific rubber and blade

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jul157

combinations. Once a brand is associated with reliability, spin, speed, or professional use, customers may remain loyal even when cheaper alternatives exist.

This shift shows that China's industry has moved beyond basic cost competition. Leading Chinese firms now compete through technology, professional credibility, product variety, and international distribution.

V. EXPORT EVIDENCE: CHINA'S GLOBAL REACH

Trade data provide a useful indicator of China's position in the global table tennis equipment market. According to WITS data for HS 950640, China exported approximately US$168.82 million of table tennis articles and equipment in 2024 [11]. The same data show a broad international customer base, with exports to more than ninety destinations. Because HS 950640 reports trade value rather than production volume, it should be interpreted as evidence of export strength rather than as a direct measure of total global manufacturing share.

Figure 1 presents the twenty largest reported destinations for Chinese table tennis equipment exports in 2024. The United States was the largest destination, followed by Germany, France, Australia, South Korea, Singapore, Hong Kong, Malaysia, and the Netherlands. The top twenty destinations together accounted for about US$133.57 million, or roughly 79 percent of China's recorded exports under HS 950640.

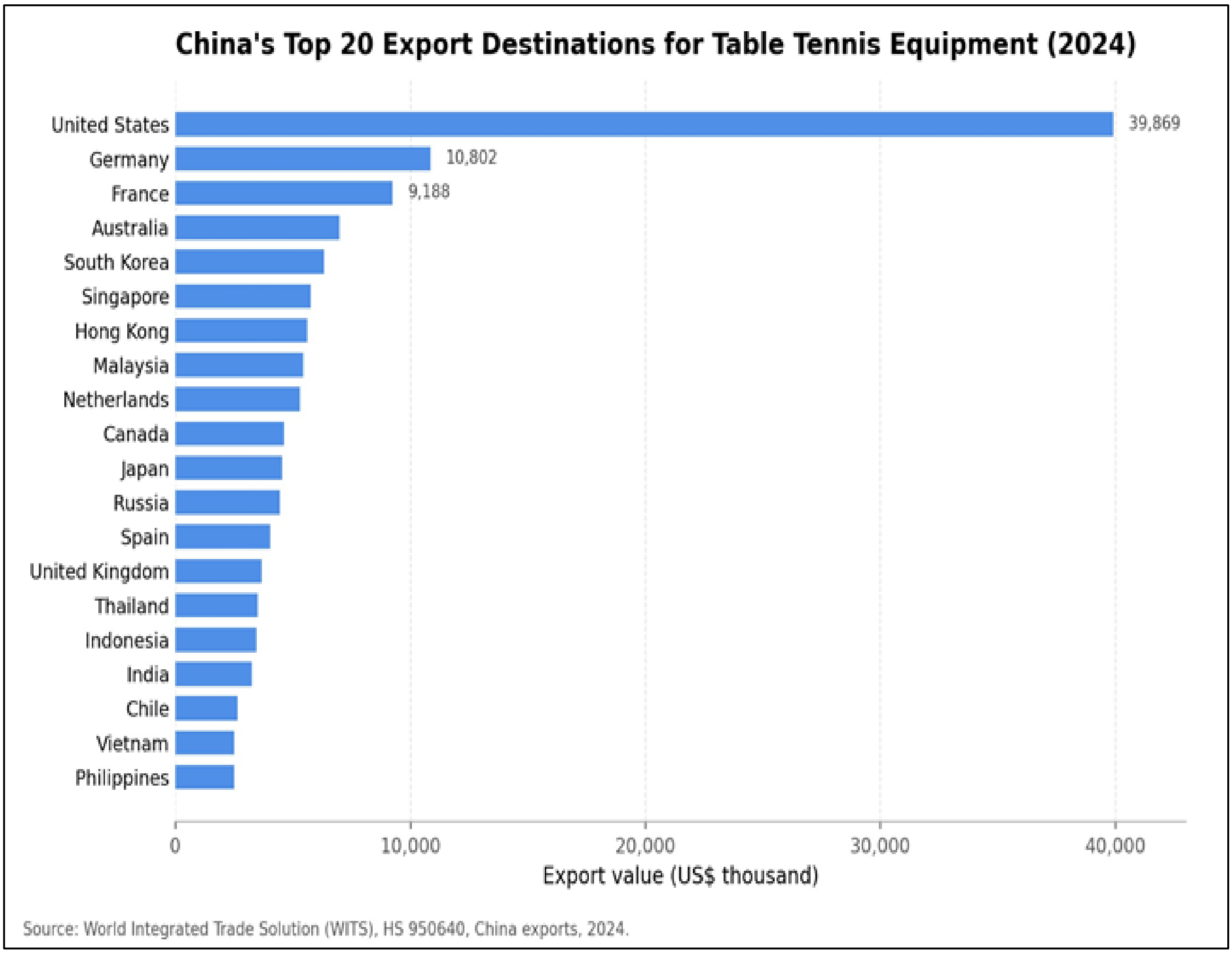

Fig 1 China's Top Twenty Export Destinations for Table Tennis Equipment in 2024. Values are Reported in Thousands of US Dollars.
Source: WITS, HS 950640, China exports, 2024.

The export pattern is economically significant. China's major destinations include developed consumer markets, table tennis strongholds, and regional trading hubs. This suggests that Chinese firms are not limited to low-income or low-price markets. Instead, they supply equipment to advanced economies with demanding consumers and established sporting cultures. The presence of Germany, France, Japan, South Korea, and the United States among major destinations indicates that Chinese equipment competes in markets where European, Japanese, and premium international brands are also available.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jul157

VI. CHALLENGES FACED BY EUROPEAN MANUFACTURERS

European table tennis equipment companies remain respected for quality, technical design, and heritage. Butterfly, Donic, Tibhar, JOOLA, and Stiga are widely recognised by competitive players, coaches, and clubs [1, 7]. Their strength lies in premium products, brand trust, and innovation in rubbers, blades, tables, and accessories. Nevertheless, European manufacturers face several structural challenges.

First, production costs are high. Labour, energy, land, and regulatory compliance costs are generally higher in Europe than in China and other Asian manufacturing centres. These costs make it difficult for European firms to compete in mass-market segments where price sensitivity is high.

Second, the domestic market is smaller. Europe has a strong table tennis culture, but its total player base and equipment demand are smaller than China's domestic market. Smaller scale limits the ability of firms to reduce average costs through very large production runs.

Third, regulation and sustainability requirements increase costs. European labour and environmental standards provide important social benefits, but they also raise production expenses. In chemical-intensive areas such as rubber production, compliance with environmental and safety rules can be costly.

Fourth, production networks are partly fragmented. Some European brands rely on specialised suppliers or outsourced production for components. ESN, a German manufacturer of table tennis rubbers, is a prominent example of specialised component production for multiple brands [9]. This model allows firms to focus on design and branding, but it can also reduce control over the full manufacturing chain and limit scale advantages.

As a result, European firms often compete through non-price factors: premium quality, brand loyalty, product design, sustainability, and professional endorsements. This strategy can be successful in high-end niches, but it is less effective against Chinese firms in lower-cost, high-volume segments.

VII. CHALLENGES FACED BY INDIAN MANUFACTURERS

India faces a different set of constraints. Its sports-goods sector has historical centres such as Meerut and Jalandhar, and Indian firms have experience producing equipment for cricket, hockey, badminton, football, athletics, and indoor sports. Meerut-based GKI is one of India's recognised table tennis equipment companies [5]. However, Indian table tennis manufacturers remain much smaller than leading Chinese producers and have limited global visibility.

First, India lacks deeply integrated table tennis equipment clusters. While India has sports-goods manufacturing centres, table tennis production does not yet benefit from the same specialised supplier networks found in China. Without strong local networks for rubber technology, blade materials, precision moulding, testing laboratories, packaging, and export logistics, firms struggle to achieve consistent quality and low unit costs.

Second, research and development investment is limited. Competitive table tennis equipment requires experimentation with materials, sponge structures, adhesives, wood veneers, carbon fibres, ball polymers, and table surfaces. Indian companies often lack the scale and technical partnerships needed to invest heavily in these areas.

Third, domestic demand is still developing. India has a large population, but the number of regular competitive table tennis players is much smaller than in China. Lower competitive participation reduces demand for high-end rubbers, blades, and training equipment. This limits scale economies and reduces the incentive for firms to invest in premium innovation.

Fourth, brand recognition is weak internationally. Serious table tennis players often rely on brands used by professionals or recommended by coaches. Indian brands have limited visibility in global tournaments, professional leagues, and international retail channels. This makes it difficult to compete against brands with decades of accumulated trust.

Fifth, links between manufacturers and professional sport are underdeveloped. In China, manufacturers benefit from close relationships with elite athletes and coaches. India could improve product development by creating systematic testing programmes in which national players, academies, and coaches evaluate prototypes and provide feedback before commercial launch.

These constraints mean that India remains a growing consumer market rather than a leading exporter. However, the same conditions also create an opportunity: if India builds stronger clusters, invests in technical capability, and links manufacturing to professional sport, it can gradually reduce import dependence and develop export potential.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/26jul157

VIII. COMPARATIVE ANALYSIS

Table 1 summarises the major differences between China, Europe, and India in table tennis equipment manufacturing.

Table 1 Comparative Manufacturing Conditions in China, Europe, and India

Factor	China	Europe	India
Market	Very large player base and steady demand.	Strong club market, but smaller than China.	Growing participation; competitive demand still limited.
Scale	Mass production lowers average cost.	Smaller runs limit cost savings.	Low volumes restrict economies of scale.
Clusters	Dense supplier, labour, and logistics networks.	Established capabilities, but less concentrated.	Sports-goods centres exist; table tennis clusters remain weak.
Productivity	Automation and supply-chain depth reduce unit costs.	High labour and compliance costs.	Wage advantage offset by productivity gaps.
Innovation	Strong athlete–manufacturer feedback.	Strong premium design and product development.	Limited R&D and fewer testing systems.
Institutions	Sporting infrastructure indirectly supports firms.	Standards and regulation support premium positioning.	Broad manufacturing policies; limited sport-specific support.
Branding	Trusted global brands across price levels.	Premium heritage brands retain loyalty.	Domestic recognition; low international awareness.
Supply chain	Integrated and export-ready.	Complex; some production outsourced.	Specialist supplier and logistics networks still developing.
Competitiveness	Very high: cost, scale, quality, and innovation combined.	Strong in premium niches.	Constrained by scale, infrastructure, technology, and branding.

The comparison shows that China combines several advantages simultaneously. Europe remains competitive where brand, quality, and product heritage matter most. India has growth potential, but it needs institutional and industrial changes before it can compete internationally.

IX. FUTURE OF GLOBAL COMPETITION

The global table tennis equipment market is likely to become more competitive as participation expands and players demand more specialised products. Future competition will be shaped not only by price but also by technology, durability, sustainability, online distribution, professional endorsements, and brand identity.

China is likely to remain the leading producer because it combines domestic demand, export capability, manufacturing clusters, and technical knowledge. Chinese firms can continue expanding across both mass-market and professional segments, especially if they maintain quality while improving product design and international marketing.

European companies are likely to remain strong in premium niches. Their future competitiveness will depend on maintaining product innovation, sustainability credentials, professional endorsements, and strong relationships with clubs and coaches. They may not match China's scale, but they can preserve value through quality, specialisation, and brand trust.

India has the greatest room for improvement. Rising participation, a large consumer base, and broader national manufacturing initiatives create favourable conditions. The Government of India's Make in India initiative and wider manufacturing policies aim to increase domestic production, skill development, investment, and export competitiveness [8, 3]. If these policy goals are connected to sports-equipment manufacturing, India could develop stronger domestic capabilities.

X. RECOMMENDATIONS FOR INDIA

To become more competitive in table tennis equipment manufacturing, India should pursue a coordinated strategy rather than relying only on isolated firms.

➢ *Develop Specialised Sports-Equipment Clusters.*

Meerut and Jalandhar already have sports-goods traditions. Building table tennis-specific clusters in or near such centres would allow manu-facturers, material suppliers, testing laboratories, packaging firms, logistics providers, and research institutions to share knowledge and reduce costs.

➢ *Increase Research and Development Investment.*

Indian firms should work with engineering colleges, sports-science departments, materials laboratories, and design institutes to improve rubbers, blades, balls, and tables. Even modest technical improvements can strengthen domestic credibility if they are tested consistently.

- *Create Athlete-Led Product Testing Programmes.*

Partnerships with the Table Tennis Federa-tion of India, academies, coaches, and professional players could help manufacturers test prototypes under real playing conditions [10]. Feedback on spin, speed, control, durability, and comfort would improve product quality and help build brand trust.

- *Target Export Markets Strategically.*

Indian firms should not attempt to compete immediately with China across all price segments. Instead, they could target selected markets in South Asia, Africa, the Middle East, and price-sensitive recreational segments while gradually developing higher-performance products.

- *Build Brand Visibility.*

Sponsorship of domestic tournaments, academy partnerships, coach endorsement programmes, international trade fairs, and e-commerce distribution can improve recognition. Brand building is essential because table tennis players often make equipment choices based on trust, peer recommendations, and professional use.

- *Link Policy Support to Measurable Outcomes.*

Public incentives should be connected to export performance, quality certification, product testing, skill development, and investment in equipment-specific technology. This would ensure that support improves competitiveness rather than merely expanding low-value production.

XI. FINDINGS

The study finds that China's leadership in table tennis equipment manufacturing is the result of a complete industrial ecosystem. The most important factors are large domestic demand, economies of scale, industrial clustering, supply-chain integration, innovation, athlete-manufacturer collaboration, and strong brand development. China's export data confirm that its equipment reaches a wide range of international markets, including major developed economies and table tennis-playing nations [11].

European manufacturers remain important because they possess premium brands, strong design capabilities, and reputations for quality. However, higher labour costs, smaller production scale, environmental and regulatory expenses, and partial dependence on specialised suppliers limit their ability to compete with Chinese firms in high-volume price-sensitive segments.

Indian manufacturers face deeper structural barriers. These include limited table tennis-specific clusters, low research and development spending, weak international branding, smaller competitive demand, and insufficient collaboration with professional sporting institutions. Nevertheless, India has significant long-term potential if it connects sports manufacturing with national industrial policy, technical education, athlete-led testing, and export strategy.

XII. CONCLUSION

China's dominance in the global table tennis equipment industry is not the result of a single advantage. It is the outcome of a highly integrated economic and sporting ecosystem in which domestic demand, industrial clusters, efficient supply chains, research and development, government-supported sporting infrastructure, automation, and elite-athlete feedback reinforce one another. These factors allow Chinese firms to produce table tennis equipment at scale while also improving quality and brand credibility.

The comparative analysis shows that Europe and India face different challenges. European firms continue to succeed in premium market segments, but they are constrained by higher production costs and smaller scale. Indian manufacturers face more fundamental obstacles, including weaker industrial integration, limited innovation investment, low global brand recognition, and underdeveloped links with professional sport.

India should view China's success as a source of lessons rather than as an impossible benchmark. By developing specialised sports-equipment clusters, investing in research and development, creating structured athlete-led testing programmes, building stronger ties with the Table Tennis Federation of India and private academies, and using national manufacturing initiatives to support export-oriented production, India can gradually build internationally recognised table tennis equipment brands.

If these reforms are pursued consistently, India can move from being primarily a consumer and importer of table tennis equipment toward becoming a more competitive producer. The process will require time, investment, and coordination, but the economic opportunity is significant. The future of global table tennis equipment competition will belong not only to the cheapest producers, but to the firms and countries that combine cost efficiency with innovation, quality, reliable supply chains, and trusted brands.

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