

Bicycle Exports from India—An Assessment

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Abstract— The research is descriptive research which includes data collecting and fact-finding investigations of different kinds and the purpose of this research is the description of the bicycle export industry as it exists at present which includes the competitiveness for bicycle export in the world, the importing markets for bicycle export from India and the price protection. The sample data is taken from 2009 to 2013 from International Trade Center (ITC). We took the data like: top importers and exporters of bicycle in the world, top importers of Indian bicycles in the world and applied Revealed Comparative Advantages (RCA) and National Protection Coefficient (NPC) methods to find out the competitiveness and price protection. We analyzed the world bicycle industry, the top manufacturers of bicycles and the history of bicycle industry of top exporters. Furthermore, we discussed the Indian bicycle industry: the top manufacturers of bicycles in India, top importers of Indian bicycles, growth rates in last five years and the importing history of top importers of Indian bicycles. We also discussed the challenges faced by Indian bicycle industry and the opportunities. Based on the data and analysis we determined the potential importing markets for Indian bicycles, India's top competitors, price protection and unit value of the bicycle. The opportunities for Indian bicycle industry to improve its status in exporting includes on technology advancement, technology transfer, research development, automated manufacturing, vendor development, product diversification and extension.

1. INTRODUCTION

A bicycle is defined as a rider-powered vehicle with two wheels in tandem, powered by the rider turning pedals that are connected to the rear wheel by a chain, and having handlebars for steering and a saddle-like seat for the rider. The name of the modern vehicle is said to be heard from 1869. From the late 18th century, numerous predecessors of this machine were found to be known as 'velocipedes', from a French name.

Rudimentary two-wheeled vehicles driven by the feet were common in late 17th century. In 1690, a Frenchman developed the celerifere, entailing a wooden beam to which the wheels were attached. The vehicle had no handlebar, the rider sat on a cushion on the beam and drove and handled the machine by propelling his feet against the ground. In 1839, Kirkpatrick added driving levers and pedals to a machine of the Draisine type by Macmillan of Scotland. These innovations enabled the rider to propel the machine with the feet off the ground. The

driving mechanism consisted of short cranks fixed to the rear wheel hub and connected by rods to long levers, which were hinged to the frame close to the head of the machine. The connecting rods were joined to the levers at about one-third of their length from the pedals. The machine was propelled by a downward and forward thrust of the foot. In 1846 an improved model of this machine, designed by a Scotsman, acquired the name Dalzell and was widely used in England. The modifications and improvements of the next 15 years included the ball bearing and the pneumatic tire. These inventions, along with the use of weld-less steel tubing and spring seats, brought the ordinary bicycle to its highest point of development. The excessive vibration and instability of the high-wheel bicycle, however, caused inventors to turn their attention to reducing the height of the bicycle. About 1880 the so-called safety, or low, machine was developed. The wheels were of nearly equal size, and the pedals, attached to a sprocket through gears and a chain, drove the rear wheel.

Cycling is potentially an important mode of sustainable transport: it is non-polluting, inexpensive, and good for users' health and the quality of urban life. But the amount of cycling in most cities worldwide remains well below its potential.

In the 1960s and '70s, as air pollution from automobile exhaust caused great concern, and the energy crisis worsened, the popularity of the bicycle increased tremendously. Some areas set up bike lanes and special bike paths. An emphasis on physical fitness in the 1970s and '80s added to this popularity, and an estimated 82 million bicycles were in use in the U.S. in the mid-1980s. Most popular was the lightweight ten-speed touring bike, modeled after European racing models. European nations reached high cycling rates through policies that give priority to cycling, walking, and public transportation over private automobiles. Bikeways that are separated from traffic, stoplights timed to the speed of bikes, shortcuts allowing cyclists to make right-hand turns before intersections, traffic calming in residential neighborhoods, ample bicycle parking, and coordination with public transport have all made cycling safe, fast, and convenient in strong biking cities.

2. LITERATURE REVIEW

India's Export Opportunity in Africa: Issues and Challenges in Select Sectors' have been done by Rakesh Mohan Joshi, Biswajit Nag and Ashish Gupta. The paper focuses on bilateral strategic cooperation between India and Africa highlighting that Africa is one of the fastest-growing economies in the world. It analyzed the overall trade dynamics between India and Africa in some selected sectors. The authors used Further Constant Market Share Analysis (CMS) model to understand the reason of export growth and more precisely the role of competitiveness gain in African market. Moreover, the paper discusses the non-tariff barriers faced by the Indian counterparts. We have specified the sector as bicycle industry and analyzed import-export relationships of India with different countries.

Bicycle production was up 3.2 percent in 2007 to 130 million units, a continuation of the upward trend that has characterized production for most of this decade. Global output continued to be largely a Chinese affair, as China produced two of every three bikes made worldwide. India, the European Union, Taiwan, Indonesia, and Brazil were the next five largest producers, accounting together for about a quarter of the total.

Increases in global commodity prices in 2007 and 2008 could soon affect bicycle production. Price hikes for steel, butyl, rubber, titanium, and other materials are driving up production costs, and materials shortages have left tens of thousands of partially completed bikes in warehouses. At the same time, the spike in gas prices in the first half of 2008 began to stimulate cycling, especially among commuters. Dealers began to stock bikes and accessories in anticipation of increased demand. In some U.S. cities, including Toledo in Ohio and Charlotte in North Carolina, rising gas prices led officials to resurrect or start police bicycle patrols. The Trek Bicycle Corporation reports increased sales of police bikes for the past three years.

'Refugees as Entrepreneurs: The Case of the Indian Bicycle Industry' by Sukhpal Singh discusses the development of bicycle industry after independence. Bicycle manufacturing took roots in up country towns, challenging competition from metropolitan enterprises. The paper discusses the factors responsible for the success of the northern entrepreneurs and by giving emphasis on the various concessions given by the government to the refugees from Pakistan says that it played critical role.

3. METHODOLOGY

This research is a descriptive research. Descriptive research includes data collecting and fact-finding investigations of different kinds. The major purpose of this research is the description of the bicycle export industry as it exists at present. In descriptive research, Ex post facto method has been used. The key characteristic of this method is that the

researcher has no control over the occurrence of data; he can only report what has happened or what is happening. While measuring the quantity of export, main market for bicycles, preferences of bicycle industries or similar data ex post facto method has been used. This also includes techniques used to discover reasons behind the data even when researchers cannot control the occurrence of data. Descriptive research consists of the survey methods like, comparative and correlational methods.

The data is taken from 2009 to 2013 as a sample. The source of data is International Trade Center (ITC). The sampling is chosen to be deliberate judgmental sampling. The referred data is secondary data.

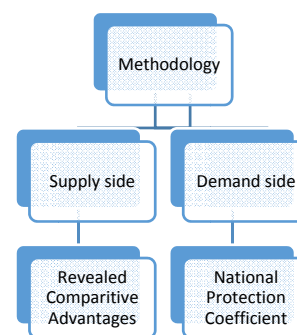


Fig. 1: Methodology

4. NATIONAL PROTECTION COEFFICIENT (NPC):

National Protection Coefficient is a modified form of Nominal Protection Coefficient. Nominal Protection Coefficient is the ratio of the price paid for a product while entering the country to the price paid inside the nation by consumers.

$$\text{Nominal Protection Coefficient} = \frac{\text{Price paid for a product while entering the country}}{\text{Price paid inside the nation by consumers}}$$

Imported and exported goods have their own ratios to show the level of additional fees added to products between their point of origin and the final buyer. A higher ratio signifies more government charges and taxes added to the original price, which increases the price paid by peoples on imported products.

In the same manner, National Protection Coefficient is defined as the price charged for a product at the time of export divided by the price paid by for the product at the time of import.

$$\text{National Protection Coefficient} = \frac{\text{Price charged for a product at the time of export}}{\text{Price paid for the product at the time of import}}$$

5. NATIONAL PROTECTION COEFFICIENT:

Table 1: National Protection Coefficient

Country/year	2009	2010	2011	2012	2013
Mozambique	2.171137	2.632734	2.201239	DNA	DNA
Nepal	2.173044	2.632643	2.204613	DNA	1.823529
United Kingdom	1.675884	DNA	3.970742	5.249082	DNA
Malawi	6.384998	9.847473	7.718637	8.304569	DNA
Zambia	9.92124	13.99539	12.48929	24.12329	DNA
Germany	4.04878	5.752812	4.501878	5.80167	DNA
Nigeria	2.70523	11.5656	2.359803	2.614625	DNA
Burkina Faso	9.513863	9.595173	11.91672	17.91523	DNA
Uganda	14.88365	23.68695	22.73484	23.39072	DNA
Kenya	DNA	10.99744	2.71879	2.815299	DNA

DNA: Data Not Available

6. REVEALED COMPARATIVE ADVANTAGE (RCA)

Revealed Comparative Advantage is the ratio of Export of a particular industry of the country to total export of that country whole divided by the ratio of world trade of that industry to world total trade.

Mathematically RCA is defined as below:

$$RCA_{kj} = \frac{X_k^j / \sum_k X_k^j}{\sum_j X_k^j / \sum_k \sum_j X_k^j}$$

Here, K is an industrial index while j is a country index, X is export.

If the RCA of a nation is greater than unity than the nation have comparative advantage in that industry. Similarly, if RCA is less than unity, the country is said to have a comparative disadvantage in the commodity or industry.

Table 2: RCA of India for bicycle export

Year	RCA
2009	0.255613
2010	0.303085
2011	0.341326
2012	0.306244
2013	0.305441

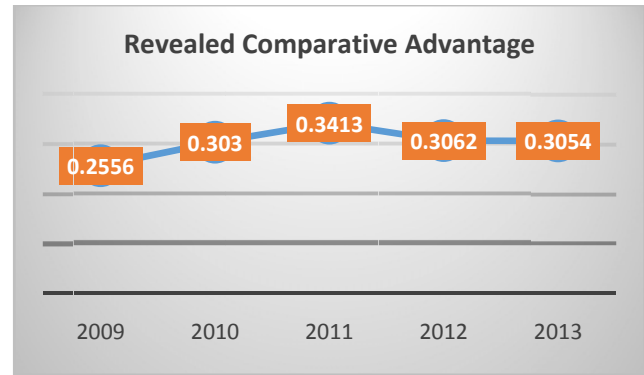


Fig. 2: Revealed Comparative Advantage

7. FINDINGS

Asia Pacific is the largest market for bicycles followed by Europe and North America. China is the biggest market of bicycle in Asia Pacific attributed to the government initiatives and consumer preference towards bicycle for their short distance travelling needs. India and Japan is exhibiting an increasing growth over the last few years. Germany is the largest market of bicycles in Europe. The U.S. accounts for the largest market share in North America.

Some of the leading companies operating in bicycle market include, Accell Group N.V, Atlas Cycles Ltd., Bell Sports Corporation, Avon Cycles Ltd., Caloi Inc., Cannondale Bicycle Corporation, Currie Technologies Inc., Campagnolo S.r.l, Cycleurope AB, Giant Bicycle Inc., and Hamilton Industries Ltd.

China has been dominating the market of bicycle in exportation and United States of America has been the biggest importer of bicycles for last 10 years. China is controlling approximately 30% exports of bicycle. We also observe that the biggest importer of bicycle (USA) is not even in the top 15 importing markets of India. India has a large opportunity of export in USA. The top importers of bicycle are not importing from India. India has a huge possibility of exporting bicycles in these nations. The top importers of bicycle from India are African countries, Nepal, Germany and United Kingdom.

From Fig. 6, it can be inferred that the total exporting value for bicycle export has been increasing from 2009. Hence it can be said that the bicycle export industry is growing at international level.

Chinese bicycle market consisted of approximately 1100 plants with a total capacity of 70 million units. Hence, in the late 1990s production developed promptly. At the end of the decade, the availability of cheap labor in China invited over hundred Taiwanese manufacturers to shift their base in China.



Fig. 3: Exported/Imported value in the world

Taiwan consists of approximately 400 bicycle units and component manufacturers. USA has been one of its main markets and since prominent bicycle companies of US are looking for outsource from Original Equipment Manufacturer in China and as a result Taiwan is facing austere international competition. Hence, the state-of-the-art-techniques and market information is brought to China by the US companies.

USA has gradually lost its market share as Chinese and Taiwanese bicycles have inundated the US market. Currently, USA is the largest importer of bicycles and imports 75% and 15% of its total imports from China and Taiwan respectively.

Europe, North America and Japan accounts approximately 70% of the global trade in bicycles. The brand of these markets are described by their high and stable demand and high merchandizing prices. Approximately 30% bicycles of China's bicycle production are exported to Europe and USA. Because of the superiority of products by using raw materials including Titanium alloy, Carbon fiber and Chrome-Molybdenum alloy, the Chinese bicycle companies have fortified a grip in the high-end-export-market.

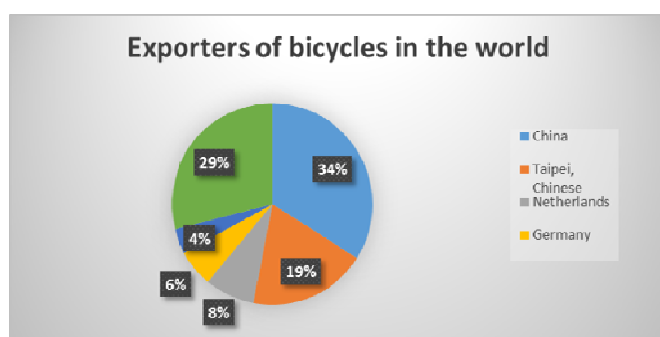


Fig. 4: Exporters of bicycles in the world

Indian bicycle industry is dominated by three organizations: Hero Cycles Ltd, Tube Investments of India Ltd and Atlas Cycles Ltd and hence oligopolistic in nature. Approximately 90% of the sales in Indian bicycle industry are controlled by these three companies and rest 10% is accounted by Avon Cycles and Hamilton.

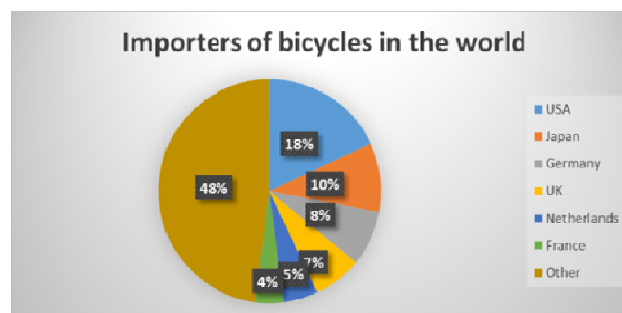


Fig. 5: Importers of bicycles in the world

A low cost structure is critical for competitiveness in the bicycle market since the bicycle industry is very sensitive to the prices. Standard bicycles offer little by way of differentiation. Operational efficiencies are the bases of a company's profitability. Approximately 70% of sales of bicycle companies consists of raw materials including steel parts, tubes, and components and selling and employee's expenses. Since companies don't have control over the prices of iron and steel (used as raw material) so manufacturing techniques, policy procurement, juxtaposition to ancillaries and consuming markets have a significant part in determining a manufacturer's cost.

Bicycle's utility varies according to the region, nationality, and status of economic development. In developing and under developed nations (including India, China, Nepal), the bicycle is a vital means of transportation whereas in the developed countries like UK, European and North American countries, the bicycle is used from basic transportation to sports.

Global economic prosperity, economic downturns and seasonal factors highly influence the bicycle industry. Generally, spring and autumn are peak seasons for bicycle sales. Therefore, manufacturers tend to adjust their output accordingly.

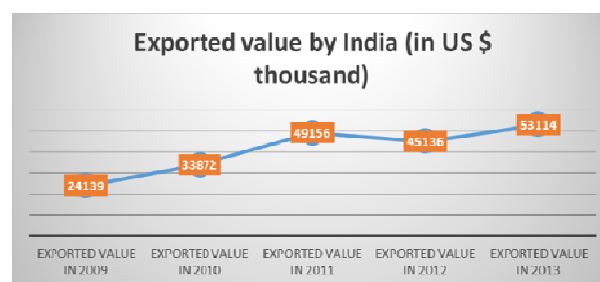


Fig. 6: Exported value by India

Indian bicycle market stands at second position with 10% units after China (50 % units). In India, bicycles can be divided into two categories: 'standard' and 'special'. The standard cycles are cheap, rugged and manufactured

specifically for rural economy. The specials are comparatively expansive and consists of fancy new generation bicycles.

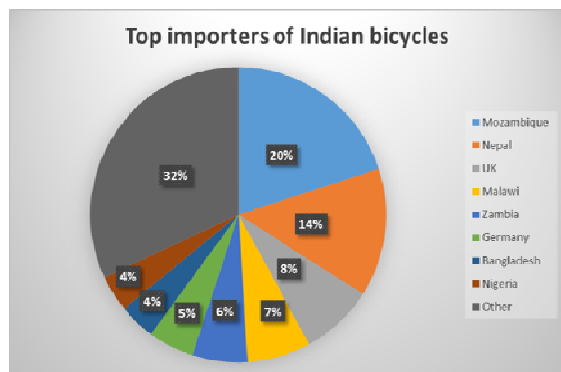


Fig. 7: Top importers of Indian bicycles

As can be inferred from Fig. 10 and Fig. 11, India's export destinations are mainly the African and South Asian countries. The similar consumer demographics brings Standard bicycles into a major portion of India's bicycles export. Hero has tied up with Japan's National Bicycle Industries in order to extend India's territory in the high-end-segment through producing high end bicycles.

India is world's second largest bicycle producer after China, accounting for about 10% of global bicycle production. India has exported bicycles worth 53 million\$ in 2013 increasing from 45 million\$ in 2012. Indian bicycle marketing is gradually growing up. In past 10 years African countries have shown special interest in Indian bicycles. Moreover, among export destinations, Indian cycles are gaining traction on UK, Nepal and Bangladesh as well. The Indian bicycle industry has significant potential in the international market and can enhance the bicycle exports substantially.

At international level India is far more behind in the export of bicycles. India is at 23rd position in exporting bicycles after China, Chinese Taipei, Netherlands, Germany, Cambodia, Belgium, Italy, Spain and sixteen more countries. The more intriguing fact is that the top most importers of bicycles are not in the list of importing markets for Indian bicycle industry.

From 2009, the number of bicycles exported from India has been non-uniformly distributed (somewhere decreasing and somewhere increasing). For Mozambique, Nepal and Malawi the curve between exported quantity and years is in zigzag form. For United Kingdom, Zambia, Germany, Nigeria and Democratic Republic of Congo the curve has been increasing gradually.

As we can see from Fig. 11, the top importing market for bicycles exported by India is Africa.

Table 3: Existing and potential trade between Africa and India

Africa's imports from India			India's exports to world			Africa's imports from world			Indicative potential trade		
Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Value in 2011	Value in 2012	Value in 2013	Potential in 2011	Potential in 2012	Potential in 2013
19,722	20,724	26,297	49,156	45,136	53,114	163,133	189,042	181,472	29,434	24,412	26,817

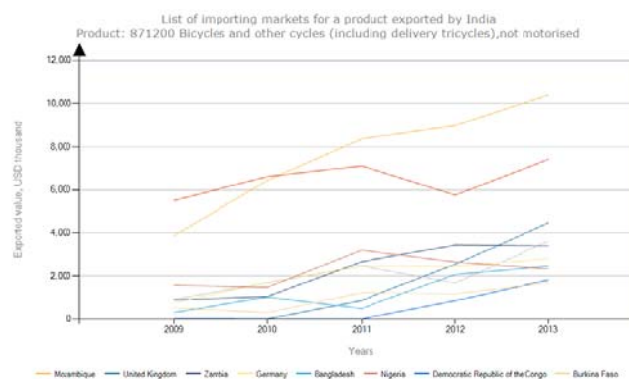


Fig. 8: Importing markets for bicycle exported by India

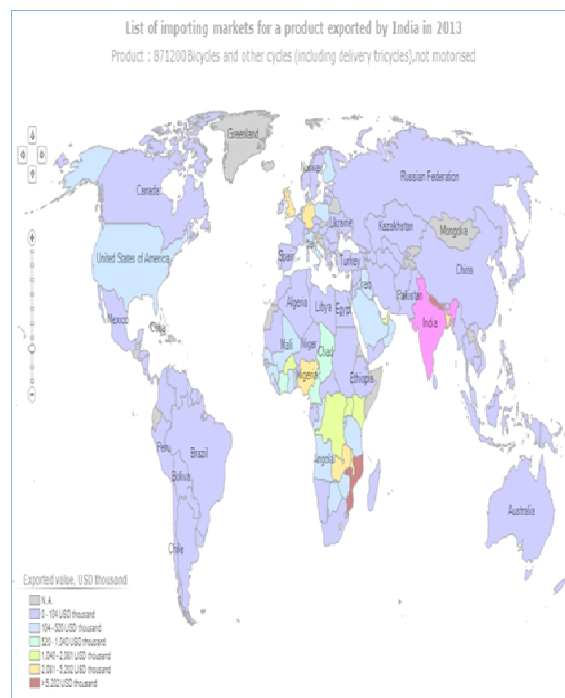


Fig. 9: Map of the importing markets for Indian bicycles

8. CONCLUSION AND RECOMMENDATIONS:

As we observe from table 1 and table 2 India has immense bicycle export opportunities in African countries like: Uganda,

Burkina Faso, Malawi, and Kenya, Germany and Nepal. Although the Revealed Comparative Advantage (RCA) is less than unity for Indian bicycle industry in last five years, still India has enormous scope for bicycle export. As the National Protection Coefficient comes out to be very high for African countries, we can say that the potential importers of Indian bicycles are the African countries.

Punjab supplies 90% of India's exports in bicycle and its parts. Indian bicycles are out-priced 20-30% by Chinese equivalents. Bicycle exporters in Punjab are making money only from the 16.7% in export incentives (of which 11.7% is in the form of Duty Drawback). Margin of 10-12% after incentives of about 17%. Clearly, the state government can boost this product's export potential (as India supplies just 1% of world's imports) by offering additional FMS and FPS-related enticements and additional relief on imports of production material with some export obligation and value-add floor through state-customized schemes.

In 2012, Europe has executed an anti-dumping duty on China-made bicycles and hence Indian manufacturers are moving towards the continent with finest offerings. Indian bicycle exports have the prospective to grow into a \$5-billion business from the present \$200 million. India used to export to European countries about 10-15 years ago and used to get large orders from countries such as Holland. Once Chinese entered the market with stylish and cost-effective cycles, Indian companies lost the market. But now again we match them in terms of pricing and quality. This is good time for Indian bicycle industry to enter European market.

Indian bicycle industry needs to focus on technology transfer and technology advancement. Even after being the 2nd largest manufacturer of the world, India isn't in the top exporters of bicycles in the world. Indian bicycles should meet the high quality requirements by advancing in technology and transferring technology from one field to another. There is a lot of scope in research and development for Indian bicycle market. The Indian manufacturers should work on research and development of bicycles.

Another field where Indian bicycles lack behind is manufacturing process. In other big exporting countries manufacturing of bicycles is done mechanically while Indian manufacturers still do it manually. Hence, automated manufacturing is strongly recommended for Indian manufacturers. Moreover, vendor development is also needed in the industry. There are not variety in bicycles produced by Indian manufacturers, there should be diversification and extension of bicycles which will lead India to improve its ranking in the exporting countries of bicycles list.

As discussed in the paper, China is the biggest exporter of the world whereas United States of America is the biggest importer of bicycles in the world. Global bicycle industry has

been growing up for last decade and is predicted to grow in the coming decade as well. For last 5 years, Indian bicycle market is stable and there is no significant progress in the market. Currently, the top importers of Indian bicycles are African countries, Nepal, Bangladesh and United Kingdom. The Revealed Comparative Advantage of Indian bicycle came out to be around 0.3 for last 5 years. The main competitors of India in bicycle industry are China, Taipei Chinese, Netherlands, Germany, and Cambodia etc.

As we observe from table 1 the National Protection Coefficients are very high for Uganda, Burkina Faso, Malawi, Kenya and Germany, there are a lot of opportunities for Indian bicycle industry to export bicycles to these African countries.

Though in recent past Indian bicycle industry is almost stable but the outlook for the future in bicycles is progressive. Since the bicycle industry is a seasonal business and can be obstructed by unusual weather. This industry relies on unrestricted expenditure and hence largely effected by economic conditions. The added advantages of bicycles (including environmental friendly, healthy and congestion free) can play an important role in developing importing markets for Indian bicycle industry. Indian bicycle industry has immense number of opportunities if it works on technology advancement, technology transfer, research development, automated manufacturing, vendor development, product diversification and product extension.

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