



Report about the Bicycle Sector of Pakistan

Prepared By: Light Engineering

Updated on: March 2000

TABLE OF CONTENTS

CHAPTER 1. INTRODUCTION	1
CHAPTER 2. METHODOLOGY	3
2.1 Primary Sources:	3
2.2 Secondary Sources:	3
CHAPTER 3. GENERAL UNDERSTANDING OF A BICYCLE	4
3.1 Segmentation of Bicycle Industry:	4
3.1.1 Standard Bicycle Segment:	4
3.1.2 Fancy Bicycle Segment:	5
CHAPTER 4. WORLD MARKETS	9
4.1 Synopsis:	9
4.2 World Production:	9
4.3 Production of Major Countries:	10
4.4 World Exports:	12
4.4.1 Taiwan Exports:	12
4.4.2 China Exports:	13
4.4.3 India Exports:	15
4.4.4 USA Exports:	17
4.4.5 Italy Exports:	19
4.5 World Imports:	19
4.5.1 USA Imports:	20
4.5.2 UK Imports:	21
4.5.3 Japan Imports:	22
4.5.4 Hong Kong Imports:	22
4.5.5 Germany Imports:	23
4.6 Pakistan's Imports:	23

TABLE OF CONTENTS

4.7 Why is Pakistan not playing a better role:	24
4.8 Success Stories from Outside Pakistan:	25
4.8.1 Country wise Analysis:	25
4.8.2 Company wise Analysis:	27
CHAPTER 5. STATE OF PAKISTANI INDUSTRY	31
5.1 Pakistan Bicycle Market:	31
5.2 Per Capita Figure:	32
5.2.1 Per capita figure of other countries:	34
5.3 Installed Capacity:	35
5.4 Capacity Utilisation:	35
5.5 Capital Investment:	36
5.6 Workforce Employed:	37
5.7 Market Size:	38
5.7.1 Bicycle Ownership:	38
5.7.2 Demand of Bicycles:	39
5.8 Market Segmentation:	39
5.9 Share of Market:	40
5.10 Lahore Bicycle Retailers Market:	41
5.11 Customer Profile:	41
5.11.1 Urban:	41
5.11.2 Rural:	42
5.12 Resale Price:	42
5.13 Average age:	42
5.14 Bicycle Maintenance Cost:	42
CHAPTER 6. KEY PLAYERS	44

TABLE OF CONTENTS

6.1 Current Bicycle Manufacturers:	44
6.1.1 PCICS, Brand Sohrab:	44
6.1.2 PECO, Brand PECO:	45
6.1.3 Capital Industries, Brand Eagle:	45
6.2 Key Parts and Processes:	46
6.2.1 Bicycle Manufacturing Process:	46
CHAPTER 7. VALUE CHAIN ANALYSIS	50
7.1 Vendor's Value Chain:	50
7.1.1 Regulatory Bottleneck:	51
7.1.2 Institutional Bottlenecks:	51
7.1.3 Technology Bottlenecks:	51
7.1.4 Productivity/Skill/Managerial Bottlenecks:	52
7.1.5 Marketing Related Bottlenecks:	52
7.1.6 Financial Bottlenecks:	53
7.1.7 Potential Threats:	53
7.2 OEM's Value Chain:	54
7.2.1 Regulatory Bottleneck:	55
7.2.2 Institutional Bottlenecks:	55
7.2.3 Technology Bottlenecks:	55
7.2.4 Productivity/Skill/Managerial Bottlenecks:	56
7.2.5 Marketing Related Bottlenecks:	57
7.2.6 Financial Bottlenecks:	57
7.2.7 Potential Threats:	58
Dealer's/Retailer's Value Chain:	59
7.2.8 Regulatory Bottleneck:	60
7.2.9 Institutional Bottlenecks:	60
7.2.10 Technology Bottlenecks:	60
7.2.11 Productivity/Skill/Managerial Bottlenecks:	60
7.2.12 Marketing Related Bottlenecks:	60
7.2.13 Financial Bottlenecks:	61
7.2.14 Potential Threats:	61
7.3 SWOT Analysis of the Pakistani Market:	62

TABLE OF CONTENTS

7.4 Cost Competitiveness Comparison Bicycle Industry:	63
7.5 Problems being faced by the Bicycle Sector:	64
7.5.1 Constraints in Raw Material Imports:	64
7.5.2 Constraints in PSM Supplied Sheets:	65
Other Hindering Factors:	67
CHAPTER 8. RECOMMENDATIONS	68
8.1 Standard Bicycle:	68
8.2 Fancy Bicycles:	70
8.3 External Variables:	71
8.3.1 Availability of Raw Material at International Prices:	71
8.3.2 Start of a Bicycle Leasing Scheme:	72
8.3.3 Technological Improvements by Decrease in Wastage:	76
8.3.4 Increase Vendorisation:	78
8.3.5 Legislative Improvements:	78
8.3.6 Regulatory Environment:	79
8.3.7 Infrastructure Improvement:	83
8.3.8 Marketing Support Programs:	83
CHAPTER 9. PLAN OF ACTION	94
9.1 Future Developments:	94
9.2 Testing:	95
CHAPTER 10. APPENDICES	I
10.1 List of Key Institutions:	i
10.2 Bibliography:	i
10.3 The Installment Plan:	i
10.4 Picture of Components:	i

LIST OF TABLES

Table 1: World & Pakistan Bicycle Production 1950-1997	9
Table 2: Production of Major Countries in millions of units 1990-1997	10
Table 3: Chinese Production and Exports 1990-99	14
Table 4: Production of Indian Manufacturers	16
Table 5: USA Bicycle Market 1991-97	17
Table 6: USA Bicycle Exports, Country Wise, 1997 vs. 1996.....	18
Table 7: US Market Share by Type	18
Table 8: USA Bicycle Imports, Country Wise, 1997 vs 1996.....	20
Table 9: Replacement Market for Bicycle Parts	36
Table 10: Replacement Market for Smuggled Bicycle Parts.....	37
Table 11: Bicycle Production in Pakistan and Afghan Transit Trade	38
Table 12: Household and Bicycle Ownership	39
Table 13: Labour Force of Pakistan 1997-98	39
Table 14: Price Structure of Pakistani Bicycle vs. Indian Bicycle	63
Table 15: Cost of Parts added by a Retailer on Bicycle	64
Table 16: Effect of Costly Inputs.....	66
Table 17: Sales Tax Earning on Bicycles	73
Table 18: HS Codes related to Bicycle.....	80
Table 19: Bicycle related ISO Standards	80
Table 20: Pakistan Standards for Bicycle and Parts	81
Table 21: Bicycle Trade Shows in 1999.....	82
Table 22: Comparative Weights of Bicycles	94
Table 23: Comparison of Bicycle Part Dimensions.....	95
Table 24: Test Results of Tires and Tubes.....	96
Table 25: Bicycle Instalment Plan	iii

LIST OF FIGURES

Figure 1: Picture of a Standard Bicycle	5
Figure 2: Picture of a Mountain Bicycle.....	6
Figure 3: Picture of a Recumbent Bicycle	8
Figure 4: World Bicycle Production 1950-1997.....	10
Figure 5: Bicycle Production of Major Countries 1990-97	11
Figure 6: World Export Market 1997	12
Figure 7: Taiwan Exports 1997.....	12
Figure 8: China Exports 1997.....	13
Figure 9 : Production, Exports and Unit Price of Chinese Bicycles 1990-98.....	14
Figure 10: Indian Exports 1997	15
Figure 11: USA Exports 1997.....	17
Figure 12: Italy Export 1997.....	19
Figure 13: World Bicycle Import Market 1997	19
Figure 14: USA Imports 1997.....	20
Figure 15: UK Imports 1997.....	21
Figure 16: Japan Imports 1997	22
Figure 17: Hong Kong Imports 1997.....	22
Figure 18: Germany Imports 1997.....	23
Figure 19: Value of Imports of Bicycle by Pakistan.....	23
Figure 20: Quantity of Bicycle Imported by Pakistan	24
Figure 21: Pakistan Bicycle Industry Overview	32
Figure 22: Bicycle Ownership in China, India and Pakistan.....	32
Figure 23: Bicycle Ownership in Pakistan 1993-97	33
Figure 24: Bicycle Ownership in Various other Countries.....	34
Figure 25: Installed and Utilised Capacity in Pakistan.....	35
Figure 26: Capital Investment and other Market Related figures.....	37
Figure 27: Market Share by Bicycle type	39
Figure 28: Market Share of Bicycle Manufacturing companies in 1999.....	40
Figure 29: Picture of Rim and Spokes	47
Figure 30: Vendor's Value Chain.....	50
Figure 31: OEM's Value Chain.....	54

LIST OF FIGURES

Figure 32: Dealer's/Retailer's Value Chain.....	59
Figure 33: Price Elasticity of Bicycle.....	74
Figure 34: Expected Increase in Bicycle Demand at Different Prices.....	75
Figure 35: Prospective Market of Morocco 1997 Scenario.....	84
Figure 36: Prospective Market of Kenya 1997 Scenario.....	84
Figure 37: Prospective Market of Egypt 1997 Scenario.....	85
Figure 38: Prospective Market of South Africa 1996 Scenario.....	85
Figure 39: Prospective Market of Algeria - 1997 Scenario.....	86
Figure 40: Prospective Market of Mauritius - 1997 Scenario.....	86
Figure 41: Prospective Market of Zimbabwe - 1997 Scenario.....	87
Figure 42: Prospective Market of Madagascar - 1997 Scenario.....	87
Figure 43: Prospective Market of Tunisia - 1997 Scenario.....	88
Figure 44: Prospective Market of Malta - 1997 Scenario.....	88
Figure 45: Prospective Market of Latvia - 1997 Scenario.....	89
Figure 46: Prospective Market of Lithuania - 1997 Scenario.....	89
Figure 47: Prospective Market of Romania - 1997 Scenario.....	90
Figure 48: Prospective Market of Estonia - 1997 Scenario.....	90
Figure 49: Prospective Market of Slovakia - 1997 Scenario.....	91
Figure 50: Prospective Market of Russian - 1997 Scenario.....	91
Figure 51: Prospective Market of Hungary - 1997 Scenario.....	92
Figure 52: Prospective Market of Czechoslovakia - 1997 Scenario.....	92
Figure 53: Prospective Market of Poland - 1997 Scenario.....	93
Figure 54: Picture of a Bicycle with Components.....	i

Chapter 1. Introduction

Pakistan is a non oil producing country; crude oil and refined petroleum cost this country about US \$1-1/2 billion annually. Unfortunately the landmass inherited by this country also does not contain good quality coal, iron ore and non-ferrous ores. Hence large-scale industrial activity with steel as a base cannot be taken on board, as an engine for growth.

Other than agriculture, for which good ground conditions exist in this society, most industrial activity will involve huge capital investment, which this society can ill afford at this stage. Progressive manufacturing of trucks, buses, cars, pickups and tractors need critical parts, which cannot be made in this society, and are still a continual drain on the foreign exchange reserves of this country. Because of the high prices of automobiles and tractors as compared to the general income in this society, the volumes have dropped. In the past many years the new car sales in this country have dropped from 65,000 units to 35,000 units annually. New motorcycle sales have dropped from 125,000 to 83,000 units. Truck, bus, prime mover, jeep, pickup sales have dropped phenomenally over a period of the last decade.

With a population of nearly 140 million which includes about 5 million Afghan refugees and 2 million Bengali, Burmese and Iranian migrants, the workforce transportation from one location to another will remain a problem for many decades to come. The daily wager construction site workers, the semi permanent low skilled industrial workforce, the rural workforce, the low waged Government employees, all need a cheap, reliable and convenient mode of travel. Buses could be a solution, but buses cost huge foreign exchange, ply on fixed routes, and on fixed times, and may not be convenient for a worker who works odd hours.

Bicycle is the only viable solution for an ordinary Pakistani worker, which can create labor mobility, which is a good factor for economic activity rejuvenation. Bicycles is a low technology alternative, at a less cost to our foreign exchange reserves. There are many critical steps which we need to take in the bicycles sub-sector as a part of the

economic activity upswing, these steps can be taken singly or altogether, and will help in the betterment of the bicycle sub-sector and as a spillover will help the general public.

- Ban the import of Chinese bicycles through Afghan Transit Trade, but allow legal import to stir competition in the domestic market.
- Improve volumes in the domestic market, register new assemblers, start a bicycle installment plan scheme in the organized sector for permanent employees in the Government, Public and Private sectors.
- Invest in a new export based bicycle project, with a JV of a Taiwanese company with Aluminium frames to capture a partial share in a US\$ 2.4 billion global market.
- Open discussions with CBR on the need to allow swaged steel pipe materials, HSLA and free cutting steel raw materials at a 5% based duty structure for all registered bicycle assemblers, @ 22 Kg per bicycle assembly capability per annum.
- Open discussions with CBR to charge sales tax on the bicycles at the retail stage and not on the manufacturing stage.
- Taxation of all types on bicycle assemblers to be collected at one window, annual inspections of all Government departments to be a single one day event once per year.

For an amount of US\$ 21million, 1.5million bicycles could be assembled in the local market, benefiting 1% of the population per annum, raising their mobility standards, improving on this country's social indicators. This is based on 25 Kg weight of bicycle and US \$ = Rs54 as benchmarks.

Chapter 2. Methodology

2.1 Primary Sources:

Most of the primary research has been done through market surveys and interaction with shop owners/retailers/dealers and OEMs. We met with people in Sohrab, Eagle, PECO, Falcon and Hero amongst the big players and Olympia in the small players. Other than Hero, we visited their factories and saw their operations and working environment.

We also conducted a survey of a sample of people in two different locations in Lahore, which we felt would represent an urban Pakistan wide survey. This survey was done to give us a relationship between the price and demand model of bicycles. This survey forms the base on which we have estimated that a reduction of Rs800 in price will increase the sales of bicycles by nearly 600,000 units per annum.

2.2 Secondary Sources:

Most of the secondary research work has been done through internet. The secondary data collection sources include Chinese and Indian newspapers accessed through the web, UN/ITC data, PC TAS, Federal Bureau of Statistics of Pakistan's Publications, various other country reports and Taiwan Bicycle and Parts Guide.

There were some conflicting figures and a decision was made to include only one data, which seemed more accurate. Similarly the data collected by government sources and that by the industry was conflicting. This was the case with Chinese bicycle production figures given to us by our Trade Counsellor in China and this was the case for the 1997-1998 data collected by SMEDA against that which was reported by FBS.

As prior to 1997-1998, there exists no source from which to gather data about Pakistan's market, we took the 1965-1997 Pakistani production of bicycles data from FBS and 1997-1999 production figures from our market surveys and research.

Chapter 3. General Understanding of a Bicycle

"The two wheeled velocipede is the animal which is to supersede everything else. It costs but little to produce, and still less to keep. It does not eat cartloads of hay, and does not wax fat and kick. It is easy to handle. It never rears up. It won't bite. It needs no check of rein or halter, or any unnatural restraint. It is little and light, let alone it leans lovingly against the nearest support"

This editorial was written in the cyclists magazine *The Velocipedist* in 1869. Although most the comparisons refer to what was then it's rival in transportation, the horse, similar comparisons with the automobile can be made today.

The bicycle took the world by storm when it was first developed in the 19th century. The idea for it came from a two-wheel hobby-horse, when Scotsman Kirkpatrick Macmillan applied the dandy-horse principle to a model with pedals. The first true bicycles, with cranks on the front wheels, went into production in Paris in 1865. They were called 'velocipedes' or 'boneshakers' (for obvious reasons), but their popularity grew. To make them more efficient, the front wheels were gradually made larger, resulting in the 20-year vogue of the ordinary (or pennyfarthing) bicycle. The safety bicycle, with a chain and sprocket drive similar to modern bikes superseded this; this went into production in 1885. Pneumatic rubber tires (1889) and variable gears (1899) were additional refinements.

3.1 Segmentation of Bicycle Industry:

Globally the bicycle market is divided into 2 segments. First and the smaller segment is the *Standard bicycle* market and the second segment, which is bigger and the growing segment is the *Fancy bicycle* market.

3.1.1 Standard Bicycle Segment:

Standard bicycle market worldwide has stagnated and is now on the decline with more and more companies turning towards fancy bicycle which cater to a wider and a larger audience.

Standard bicycle is the most popular version of bicycle being produced and used in Pakistan. It holds the largest share amongst all types of bicycle. These are being produced in a variety of sizes ranging from 20" to 24" and come in 2 models, Single Bar and Double Bar. The picture below shows a double bar version of Sohrab Standard bicycle.



Figure 1: Picture of a Standard Bicycle

Standard bicycles in Pakistan are produced with Rexine covered bicycle seat, of steel structure and a single color. A recent development in this model of bicycle has been the introduction of plastic injection molded bicycle seat, which reduces the cost and the number of parts required and approaches a more modernistic look. Similarly, the introduction of a combination of colors for this bicycle has created an impact in the local bicycle market.

These bicycles are used for everyday work by the worker class and are usually bought with a carrier, stand, lock and bell. A ladies version of standard bicycle was introduced in Pakistan but it failed to catch on and hence it had to be disbanded.

Worldwide, China, India and to a smaller extent Bangladesh are the only 3 countries that are catering to this segment and they too are turning shifting towards fancy bicycles.

Africa is the only market where this model of bicycle can be exported and China and India are currently catering to that market.

3.1.2 Fancy Bicycle Segment:

Globally fancy bicycle is the fastest growing segment of the bicycle industry with nearly all Research and Development being done in this segment. This segment has been further divided into many sub-segments, which include:

Mountain Bicycle:



Figure 2: Picture of a Mountain Bicycle

The largest selling version of bicycle world wide is the Mountain Bike/All Terrain Bike (MTBs/ATBs) segment. It is also the largest growing segment in the Pakistani bicycle market. MTBs/ATBs are the technological improved versions of standard bicycle and are used mostly for trekking, recreational and sports purpose.

MTBs/ATBs have been further segmented into Sprinter/Racer bicycle, recumbent bicycles, electric bicycles, folding bicycle. These are highly value added segments of the bicycle market and although they cater to a niche market but the profits are high for these segments and the price of these bicycle can range in thousands of US\$.

The major difference between standard bicycle and MTBs/ATBs is the difference in weight. The lighter the weight, generally the higher the cost of the bicycle.

Another difference in MTBs/ATBs and standard bicycle is the multiple gear system. The MTBs/ATBs have multiple gearing system ranging from 6 gears to 24 gears and now come with front and rear Shock Absorbers for a smoother ride. Gears are changed by a

lever system. Plastic injection molded bicycle seats were introduced with these models in order to reduce parts and weight and save costs.

MTBs/ATBs are being made in low weight alloys usually of Aluminium although the professional bikers use bicycles made of Carbon Fiber. Taiwan is now moving towards Magnesium Alloy and eventually plan to make a bicycle weighing 7.9 kg.

Aesthetically this segment of bicycle is a major improvement over standard bicycles and come in a variety of colors appealing to the audience to which it caters.

BMX Bicycle:

BMX bicycle is being used as a generic name, which caters to the growing and school going children market. Nearly all manufacturers in Pakistan are producing a variety of these bicycles, ranging in size from 16" to 24" with multiple and single gear system. These too are made lightweight and multicolored to appeal to the younger generation.

Tricycle:

Tricycles are meant for toddlers and consist of 3 wheel or 4 wheel bicycles. These are meant to familiarize a child with a bicycle. To make this bicycle strong, these are mostly of steel structure with plastic and foam covered seats and multicolored plastic wheels. This too is a very niche market.

Recumbent and Electric bicycle:

A very niche and fast developing segment of the fancy bicycle is recumbent and electric bicycle segment. Taiwan is the largest manufacturer of electric bicycles and majority of its electric bicycle production is exported to Japan. Electric bicycles are being used primarily in developed countries, as these are environmental friendly and there exist a much better awareness of pollution free vehicles in these countries.



Figure 3: Picture of a Recumbent Bicycle

Recumbent bicycles are reclining bicycles, which are specifically meant for recreational purpose. A major benefit of a recumbent is the awesome power that a rider can deliver to the pedals. A recumbent provides the rider with something to push against (the back of the seat), so total leg power can be delivered to the pedals. This is in addition to the lower frontal area and reduced air resistance, which gives more speed. In contrast, a conventional bicycle limits the maximum push against pedals to roughly that of the rider's weight.

Latest developments in this fancy bicycle segment have made these bicycles lightweight with the use of aluminium and magnesium alloys and these have been made foldable to make them easy to transport.

As it is not possible to divide the bicycle market figures into standard and fancy bicycles, hence these have been taken collectively. All the export and import bicycle figures that have been reported in this report are inclusive of all segments with probably 80% of all figures consisting of MTBs/ATBs segment alone.

Chapter 4. World Markets

4.1 Synopsis:

The world production of bicycle was roughly 95 million bicycles with China being the world's largest manufacturer of bicycle, producing nearly 30 million bicycles in 1997. The production of bicycles has been declining since 1993 with China cutting down its bicycle production. India, Taiwan and USA are the other major manufacturers of bicycle. Biggest exporters of bicycles, in terms of value, include: Taiwan, China, USA, Italy, Netherlands and India. The major importers, in terms of value, were: USA, Germany, Japan, Hong Kong, UK and France. The bicycle market was worth US\$2.40 billion in 1997.

Amongst the major producers, China and India are still making standard bicycle, as their local market is predominantly of standard bicycle but they are shifting towards value added MTBs and ATBs in order to tap the export market.

4.2 World Production:

In a report done by the World Watch Institute, published in 1999, entitled "*Vital Signs 1999, the Environmental trends that are shaping our future*", the world bicycle production figure for 1997 was estimated to be 94 million units.

From that report, the figures for world production of bicycle since 1950 are:

Year	Production (million)	Pakistan Production	Year	Production (million)	Pakistan Production
1950	11		1988	105	654,693
1955	15		1989	95	560,277
1960	20		1990	94	530,166
1965	21	97,221	1991	100	428,824
1970	36	161,289	1992	103	478,407
1975	43	210,365	1993 (Peak)	109	588,568
1980	62	279,375	1994	107	563,687
1985	79	462,604	1995	107	473,385
1986	84	447,760	1996	99	545,114
1987	98	593,058	1997 (prel)	94	432,438

Table 1: World & Pakistan Bicycle Production 1950-1997

The data about Pakistani bicycle production, which has been given in table 1, is taken from Federal Bureau of Statistics (FBS).

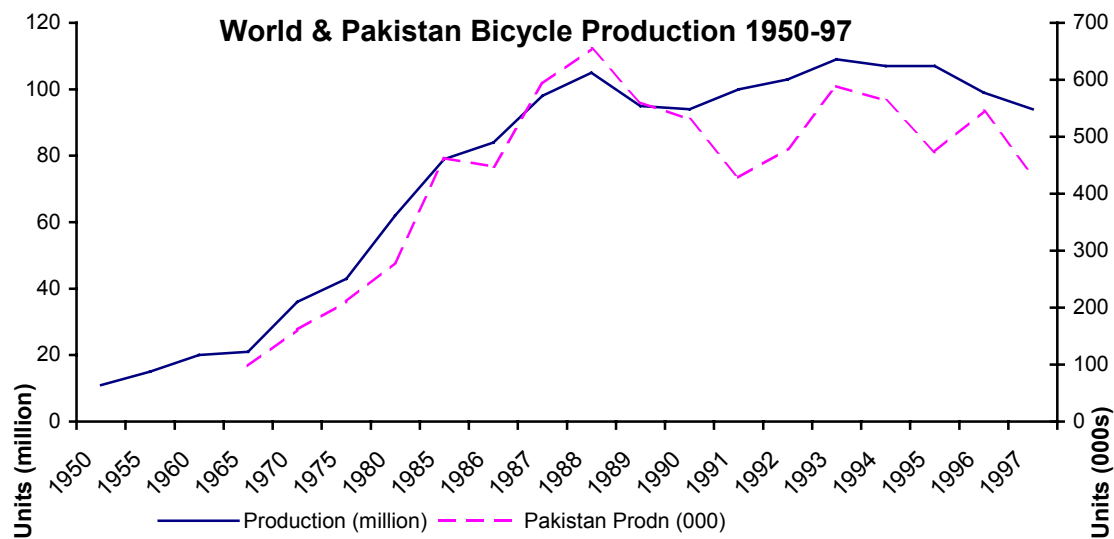


Figure 4: World Bicycle Production 1950-1997

For the rest of the report, the figures from 1965-1997 are taken from FBS publications while the 1997-1999 figures are based upon research work done by SMEDA.

4.3 Production of Major Countries:

According to the *World Market Report*, published by the Interbike Directory of 1999, the bicycle production of world's major countries from 1990-1997 was:

Country	1990	1991	1992	1993	1994	1995	1996	1997	Average
China	31.9	36.79	40.28	40.95	41.95	41	38	30	37.61
India	8.45	8.84	9	9.9	10.5	11.5	11.3	11.5	10.12
Taiwan	6.8	7.72	7.5	7.9	9.2	9.67	7.38	11.9	8.51
USA	5.56	7.58	8.88	7.68	7.3	8.47	7.4	6	7.36
Japan	7.97	7.45	7.29	6.86	6.7	6.58	6.14	5.98	6.87
Italy	3.5	3.6	3.5	4.2	5.6	5.2	3.95	3.4	4.12
Germany	3.86	4.83	4.55	4.1	3.5	3.2	2.9	2.82	3.72
Brazil	1.5	2.11	2.34	3.81	3.9				2.73
Indonesia	1.95	2	2.2	2.5	2.8	3	2.3	3	2.47
France	1.64	1.17	1.04	0.95	1.3	1.3	1.33	1.29	1.25
Thailand	0.7	0.85	0.95	1	1.1	1.8	1.5	1.8	1.21
UK	1.26	1.16	1.18	1.1	1.15	1.25	1.23	1.27	1.20
Korea	1.54	1.53	1.26	1.1	1.19	1.05	0.93	0.76	1.17
Canada	0.83	0.56	0.61	0.66	0.75	0.93			0.72
Malaysia	0.28	0.4	0.6	0.7	0.8	0.8	0.5	0.8	0.61
Total	77.74	86.59	91.18	93.41	97.74	95.75	84.86	80.52	

Table 2: Production of Major Countries in millions of units 1990-1997

China is the world's largest manufacturer of bicycles with India holding, on average, the 2nd position and Taiwan the 3rd.

The units produced in EU are on the decline due to the cheap imports coming from other countries, especially Asian countries. For this reason, EU has imposed an anti dumping duty on bicycle imports from China, Taiwan and other South East Asian bicycle manufacturing countries. The anti dumping rate imposed on Taiwan made bicycles varies from factory to factory, but ranges from 3% to 18% (with a weighted average of 5.2%). For this reason, Taiwanese companies are considering to set up their bicycle manufacturing plants in Europe. This will give them an open access to the European market and bypass the anti dumping duty law.

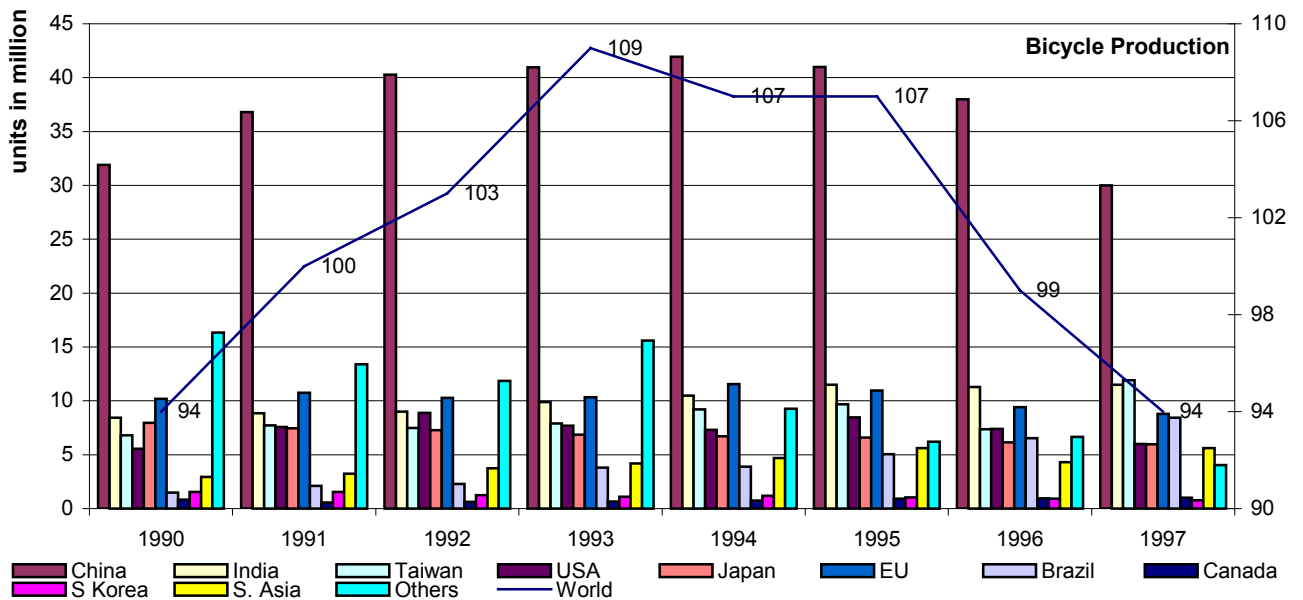


Figure 5: Bicycle Production of Major Countries 1990-97

The above figure indicates that the production of bicycles has been on the decline since 1993, but if share of China is taken out of the world bicycle production scenario, then the production of other countries has been in the region of 63-65 million units for the last 8 years; at an average of 64 million units. This indicates the market domination of Chinese manufacturers, in terms of production.

4.4 World Exports:

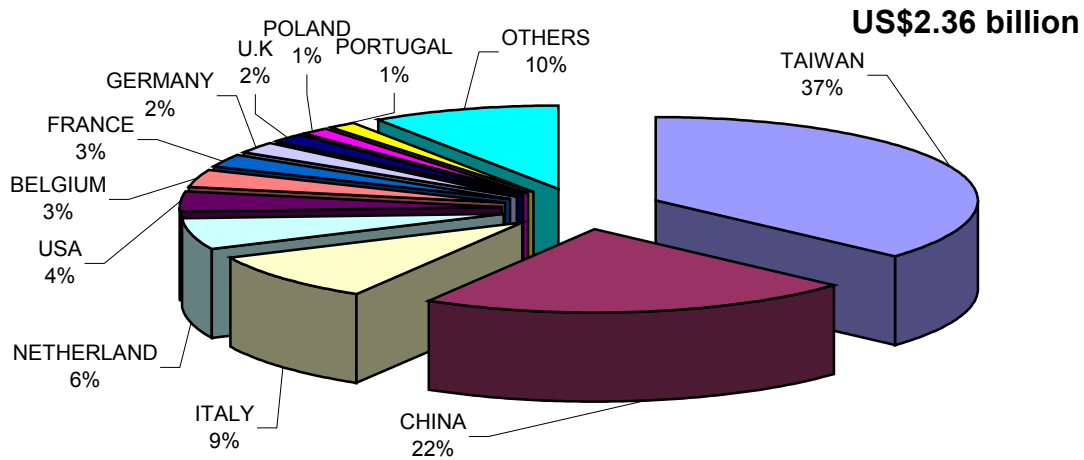


Figure 6: World Export Market 1997

According to the *UN/ITC* and *Taiwan Bicycle Industry* data of 1997, the total world export market of bicycles was approximately US\$2.36 billion.

According to the *Taiwan Bicycle Industry Background Information of 1997*, Quantity wise, China was the largest exporter of bicycles and value wise, Taiwan was the largest exporter.

4.4.1 Taiwan Exports:

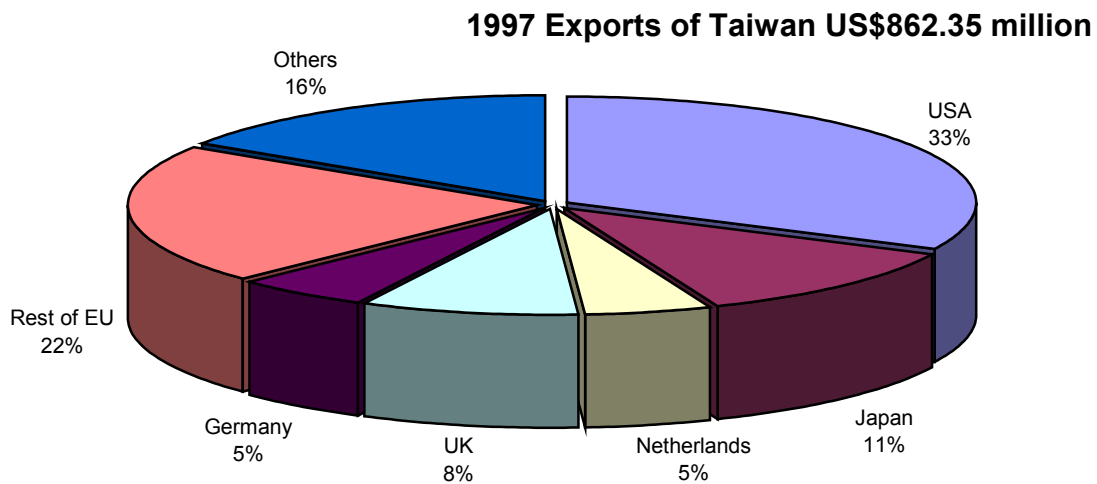


Figure 7: Taiwan Exports 1997

According to a Biknet *Taiwan Bicycle Industry Background Information report*, Taiwan has been the world's number one bicycle supplier, in terms of value, ever since 1980 and the export value reached its peak in 1992, with US\$1.06 billion.

According to *Taiwan Customs Bureau*, Taiwan exported a total of 8.8 million bicycles during the year 1997, which was a 7.1% decrease compared with the quantity exported for year 1996. The total export value was US\$ 862.4 million, 12.2% less than 1996. Although main land China had been selling more bikes globally since 1988 and was first in quantity exports, Taiwan was still considered to be the number one supplier, if the total export value is taken into account. The unit price of bikes made in China is comparatively low as compared to that of Taiwan. Taiwan is producing value-added bicycles and is into manufacturing electric bicycles, folding bicycles and alloy based frame bicycles.

Taiwanese manufacturers also exported US\$404 million worth of bicycle parts and accessories, which included: frames, front forks and related parts, tire, steps and related parts.

The largest bicycle manufacturer in Taiwan is Giant, which has set up a plant in Netherlands, which produced 180,000 bicycles in 1998. They plan to increase that plant's capacity to 500,000 bicycles per annum and are already manufacturing 1.9 million bicycles annually in Taiwan.

4.4.2 China Exports:

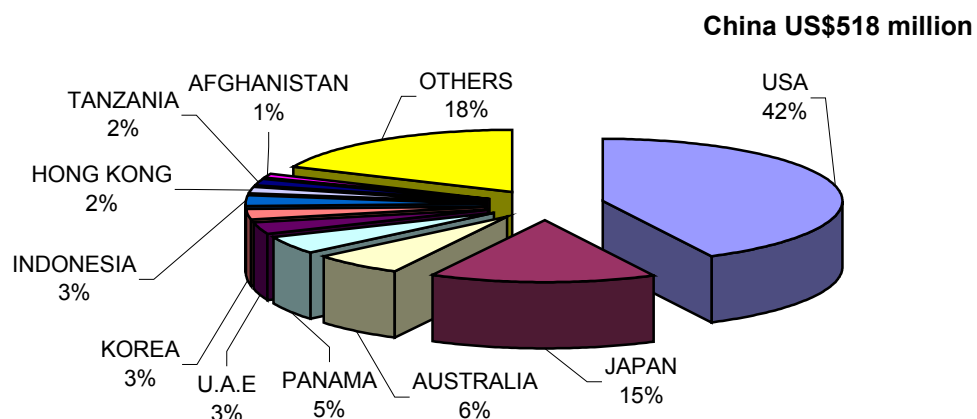


Figure 8: China Exports 1997

China with US\$518 million exports, held 22% of the world market share in 1997. Major portion of their exports went to USA, which accounted for roughly 42% of the total exports of China. According to a report in the *Bike Book News*, dated 3rd November 1998, approximately 30 million bicycles were sold in China. Out of these, 85% were traditional Chinese built utilitarian bicycles and 15% can be classified as recreational bikes such as mountain bikes.

Although the bicycle production in China has been on the decline, their export of bicycles has been on the rise. According to *China's Statistical Bureau*, the figures for the Chinese exports from 1990 to beginning of 1999 are:

Year	Total Production (million units)	Export (million units)	Export of Bicycles (10,000 US\$)	Export of Bicycle Parts (10,000 US\$)	Unit Export Price, \$
1990	31.42	3.38	14492	6255	42.9
1991	36.77	7.29	35838	6991	49.1
1992	40.84	10.24	42833	10384	41.8
1993	41.57	10.33	42065	15509	40.7
1994	43.65	13.42	50312	20218	37.5
1995	44.74	12.62	53512	35788	42.4
1996	33.61	12.17	46347	34677	38.1
1997	29.99	14.39	51262	43905	35.6
1998	23.12	17.61	61177	43294.8	34.7
1999 (Jan-Feb)	3.13	1.99			

Table 3: Chinese Production and Exports 1990-99

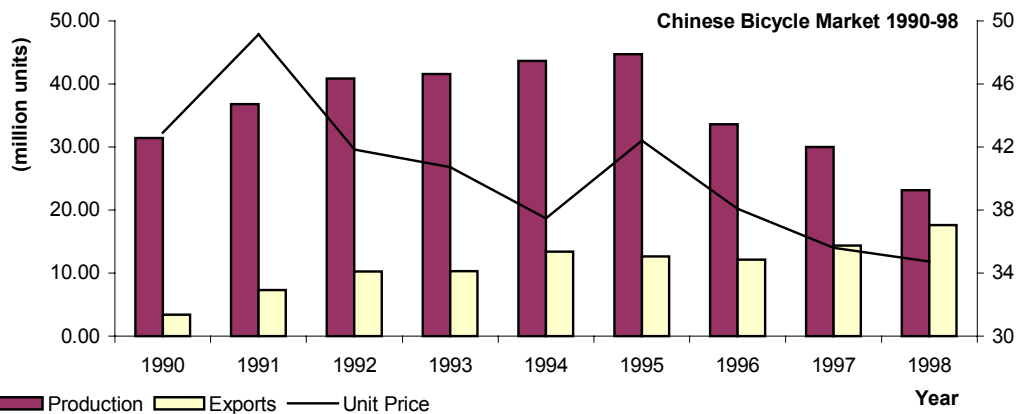


Figure 9 : Production, Exports and Unit Price of Chinese Bicycles 1990-98

The reason why Chinese bicycle production is on the decline can be attributed to various factors that include:

- Rising buying power of Chinese people, hence people are shifting towards powered vehicles.
- Banning of bicycles during daytime in some cities.

The price of a standard Phoenix bicycle, which is the only Chinese brand present in Pakistan, in China ranges from RMB 416-430, about US\$50.12-\$51.80. (8.3 RMB = 1US\$). Standard bicycles of other manufacturers cost in China anywhere from RMB 200-400 (US\$24.10-US\$48.19).

The export rebate applicable for the Chinese bicycle industry with effect from 1st January 1999 is 17%. This has been increased from 9%. Economists perceive that this has been done to boost Chinese exports and make them competitive in the international market in the wake of currency devaluation by other Asian countries.

4.4.3 India Exports:

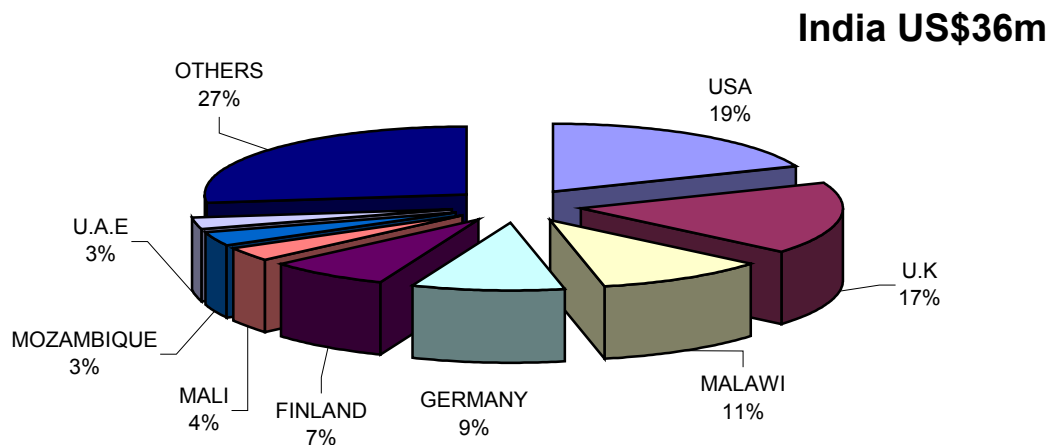


Figure 10: Indian Exports 1997

Indian bicycle exports accounted for roughly US\$36 million in 1997. Although USA was the largest importer of Indian bicycles, a heavy portion of Indian bicycles were exported to other third world countries like Mali, Mozambique, Malawi in East and Central Africa.

Hero cycles of India are *the largest manufacturer of bicycles in the world* and were making more than 16,000 bicycles a day in 1997. This year they expect to produce

in excess of 5 million units, of which they plan to export approximately 1.25 million units. They have now upgraded their plants to produce more than 18,000 units a day.

The *second largest manufacturer* of bicycles in India is *Atlas*, which makes more than 200,000 units per month and manufacture their own steel tubes.

The *third largest manufacturer* of bicycles in India is *TI cycles*, which is manufacturing 1.9 million bicycles per annum. They are the largest manufacturers of specialty (fancy) bicycles in India.

The *fourth largest bicycle manufacturer* in India is *Avon*, which produces 5,000 bicycles a day in India and exports to some 78 countries. They have bought a plant in Tanzania, National Bicycle Co Ltd., which has a capacity of 10,000 bicycles a month. They plan to increase production of that plant to 200,000 per annum. Avon manufactures its own Cold Rolling strips and steel tubes in India.

	Hero	Atlas	TI Cycles	Avon
Production of Bicycle per day	18,000	7,000	6,500	5,000

Table 4: Production of Indian Manufacturers

Nearly all the major players have set up specialized export oriented units (EOU) and acquired the status of trading houses.

Currently Indian standard bicycle costs in the region of Indian Rs.1200 to 1500 (US\$28-35, 1 US\$ = 43.3 Indian Rupees), depending upon the type, model, make and the Indian union state in which it was sold.

According to a news report that appeared on the 3rd May 1999 in *Economic Times of India*, bicycle sector in India has shown a negative growth rate of over 30% during the year 1998-1999. If the local market is shrinking and the manufacturers are expanding their operations, it indicates that they plan to increase their exports.

The Indian bicycle industry is based largely on vendorisation and even Hero cycles do not make everything. Some manufacturers have their cold rolling strip units and steel tubes manufacturing plants, which is not the case with Pakistani manufacturers.

4.4.4 USA Exports:

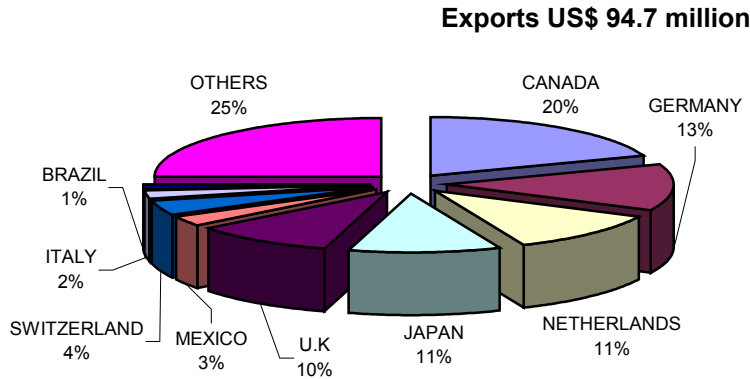


Figure 11: USA Exports 1997

According to the *UNITC/PC-TAS* data, USA exported nearly US\$95 million worth of bicycles in 1997. Canada constituted the biggest market of American bicycles with a major portion also going to EU.

According to the *Interbike directory*, the approximate retail value of US bicycle market (bicycle and related parts and accessories) in 1997 was US\$5.4 billion. A total of 15.8 million bicycles were sold, of which 9.8 million were imported and 6 million were domestically produced in the USA. The bicycles exceeding 20 inches and over segment sold 11 million units.

The top three sources of US bicycle imports were China with 5.7 million units (58%), Taiwan with 3.3 million units (33%) and Philippines with 271,829 units (2.7%). The average gross profit on retail bike sales was 34.4%, while the average net profit for a shop before tax was 5.3%.

US Bike Market 1991-97		
(million Units)		
Year	Imports	Exports
1991	6.5	8.6
1992	6.3	9
1993	7.1	9.9
1994	7	9.7
1995	7.2	8.8
1996	7.5	8
1997	9.8	6

Table 5: USA Bicycle Market 1991-97

US Bicycle Exports 1997 vs. 1996, units			
Country	1997	1996	% Change wrt 1996
Canada	88,208	49,343	79%
Central/S America	35,018	24,235	44%
Other EU Countries	30,819	22,107	39%
Pacific Rim	27,497	50,385	-45%
Germany	27,061	38,528	-30%
Holland	21,229	28,265	-25%
UK	18,628	14,713	27%
Mexico	17,959	9,836	83%
Italy	6,798	4,323	57%
France	5,539	4,650	19%
Other	6,716	5,641	19%

Table 6: USA Bicycle Exports, Country Wise, 1997 vs. 1996

US Market Share by Bike Type, Unit and Retail Dollar Sales, 1997		
Category	% 1997 Units	% 1997 Retail Dollars
Mountain	51%	60%
Road	1%	4%
Hybrid	3%	13%
Cruiser	2%	2%
Youth	15%	8%
BMX	18%	12%

Table 7: US Market Share by Type

Bicycles in USA are sold through two distinct distribution channels; independent dealer and the mass merchant. The average price of a bicycle sold at a bicycle shop was US\$ 355, though prices can range into thousands of US\$.

4.4.5 Italy Exports:

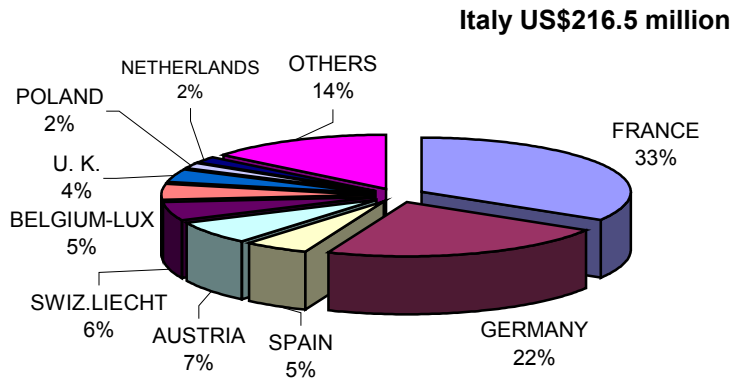


Figure 12: Italy Export 1997

Italy exported US\$216 million worth of bicycles in 1997. Majority of these were exported to European Union countries, with France and Germany accounting for 55% of the share.

4.5 World Imports:

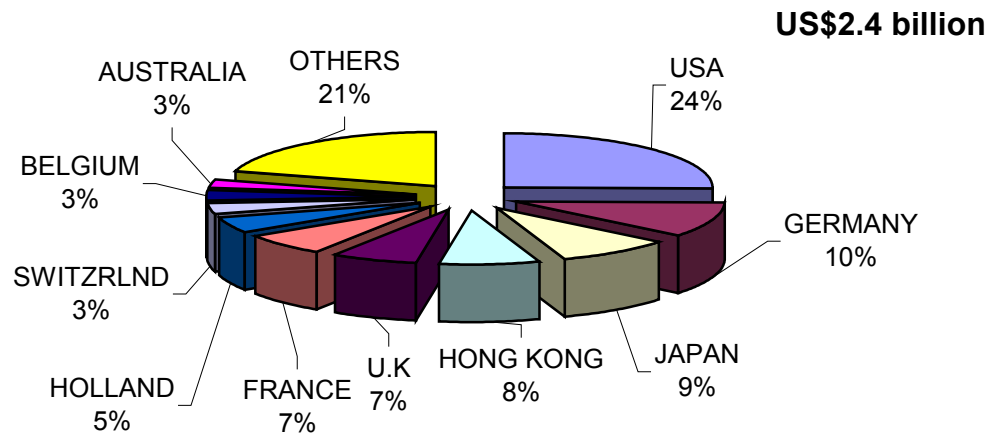


Figure 13: World Bicycle Import Market 1997

The world import market in 1997 was roughly equivalent to US\$2.4 billion with USA alone accounting for nearly a quarter of the import market. European Union has imposed anti dumping duties on low cost bicycle imports from China, Taiwan and other South Eastern Asian countries.

4.5.1 USA Imports:

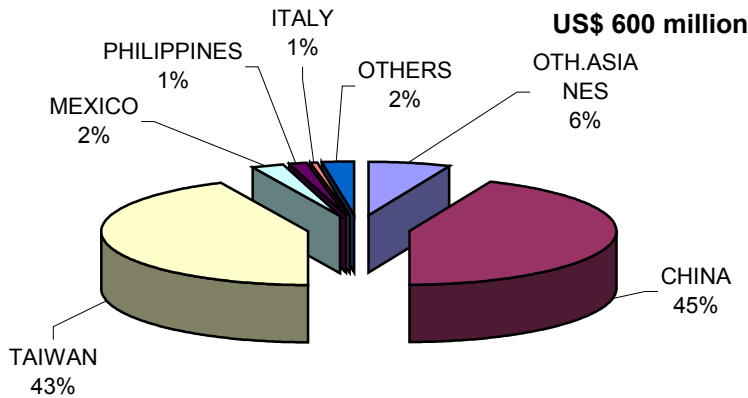


Figure 14: USA Imports 1997

USA imported US\$600 million worth of bicycles in 1997, of which China accounted for 44% of the market. Overall, Asian countries accounted for 94% of the USA market. This included a large amount of imports from Taiwan. According to Taiwan's Customs Figure, US\$265 million worth of imports to USA came from Taiwan, an overall figure of 43% for the whole of the USA market.

US Bicycle Imports 1997 vs. 1996, Units			
Country	1997	1996	% Change
China	5,770,132	3,890,994	48%
Taiwan	3,334,940	3,127,258	7%
Philippines	271,829	252,080	8%
Mexico	244,662	35,379	592%
India	55,777	107,312	-48%
Malaysia	43,090	18,576	132%
Other	69,043		
Total	9,789,473	7,431,599	

Table 8: USA Bicycle Imports, Country Wise, 1997 vs 1996

Note: India's exports to the US fell by nearly 50% in 1997 as compared to 1996. It was the only country whose exports of bicycle fell during that period.

4.5.2 UK Imports:

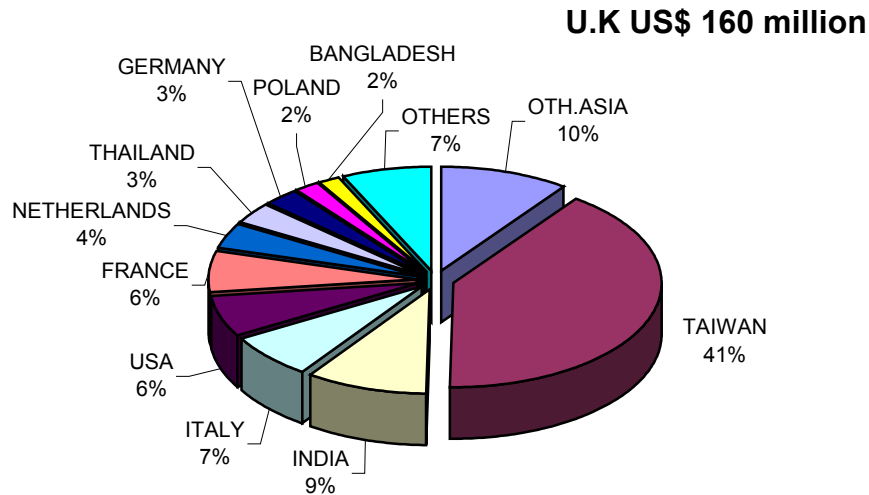


Figure 15: UK Imports 1997

UK imported US\$160 million worth of bicycles in 1997. Asian countries accounted for roughly 65% of this market. Out of this, India accounted for 9% and Bangladesh held 2% of the bicycle market share. In 1997, Taiwan's exported bicycles worth US\$64.5 million to UK; a share of 41% of the total UK import market.

It is interesting to note that Meghna Cycle Industries Limited of Bangladesh has entered into a joint venture with Universal Cycle UK to produce 20,000 units per month. This unit will be a hundred percent export oriented unit to be made operational in October 1999.

4.5.3 Japan Imports:

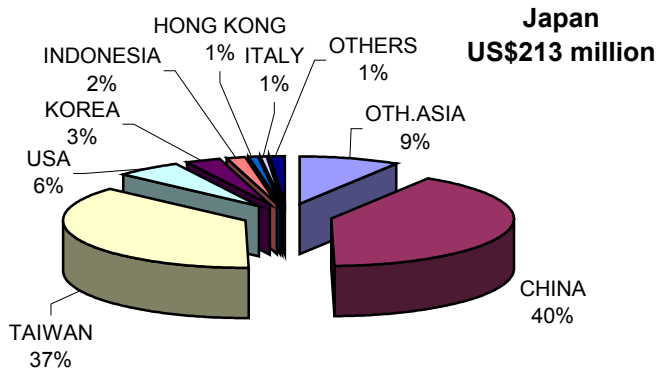


Figure 16: Japan Imports 1997

Of Japan’s US\$213 million bicycle market, Asian countries accounted for more than 90% in 1997. China alone accounted for 41% of the market while Korea and Indonesia combined held 5% of the share close to USA's share of 6%. In 1997, Taiwan's exported bicycle worth US\$78.8 million worth of bicycle to Japan; a share of 37% of the total Japanese market, second behind China.

4.5.4 Hong Kong Imports:

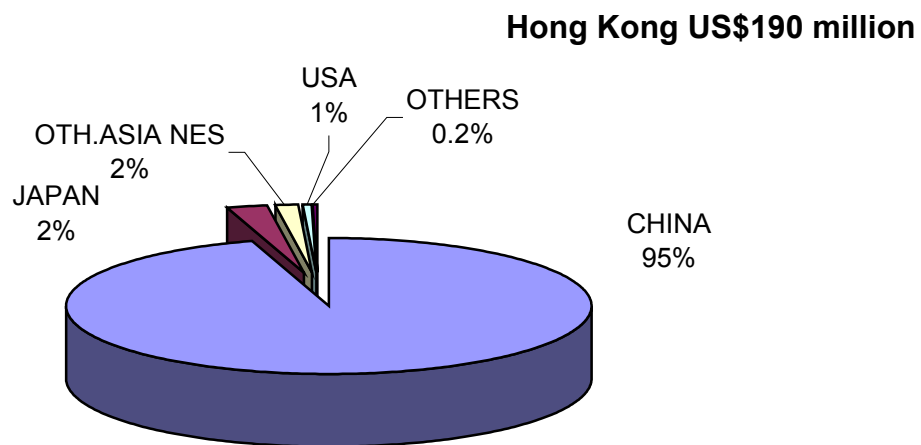


Figure 17: Hong Kong Imports 1997

Hong Kong’s bicycle market was dominated by China, which accounted for 95% of the total market in 1997. Nearly all the bicycles were supplied from Asian countries.

4.5.5 Germany Imports:

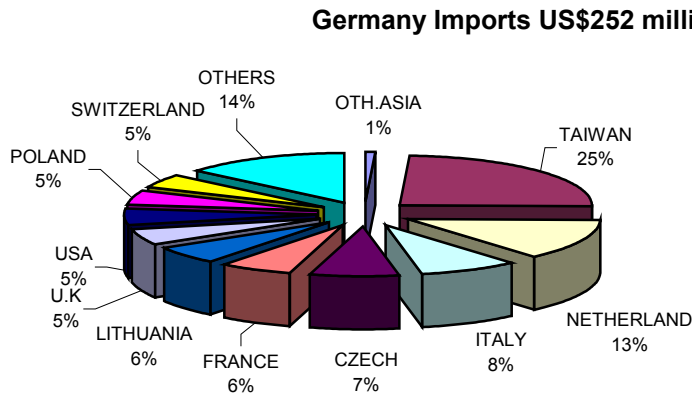


Figure 18: Germany Imports 1997

German bicycle market was worth US\$252 million in 1997 with Asian countries accounting for 26% of the market. Netherlands was a major exporter of bicycles to Germany with a 13% market share. In 1997, Taiwan's exported bicycle worth US\$61.7 million worth of bicycle to Germany; a share of 25% of the total German market, by far the largest share.

4.6 Pakistan's Imports:

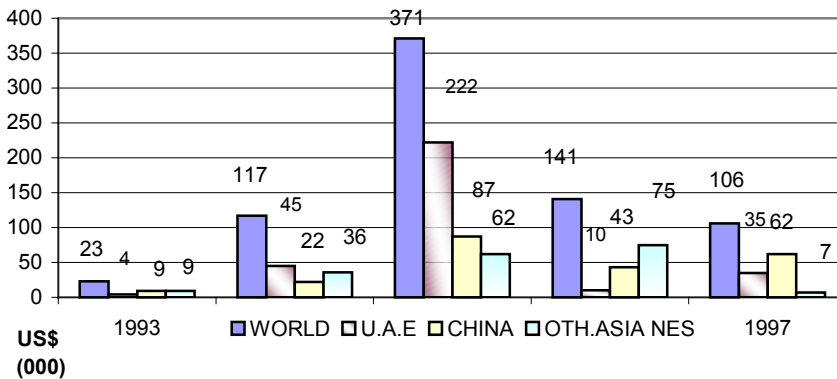


Figure 19: Value of Imports of Bicycle by Pakistan.

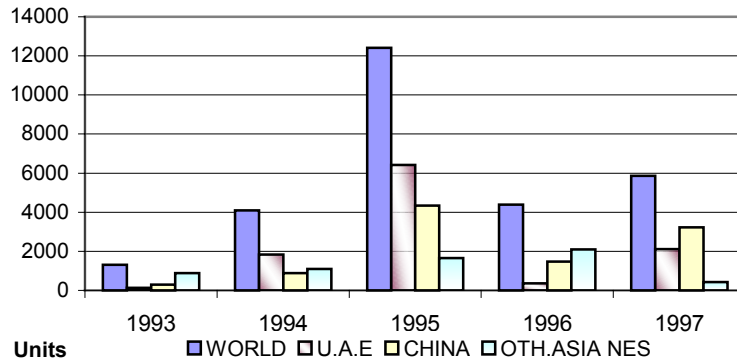


Figure 20: Quantity of Bicycle Imported by Pakistan

According to the UN Trade Statistics for 1997, US\$ 106,000 worth of bicycles were imported into Pakistan; amounting to 5857 units. US\$ 65,000 worth of bicycles came from China, approximately 61% of the total, while US\$35,000, approximately 33% worth of bicycles came from UAE. From 1993 to 1997, the imports of bicycles amounted to US\$758,000, a total of 28,054 units. The highest amount of bicycle imports were reported in 1995, when the imports were US\$371,000, with nearly 60% coming from UAE and nearly 24% coming from China.

All the imported bicycles that are coming into Pakistan are fancy bicycles, mostly of Taiwan origin.

4.7 Why is Pakistan not playing a better role:

Pakistan's market scenario is that of a monopolistic market. We have only one big player, Sohrab. The rest are comparatively too small and do not have enough of a local market presence to compete at par with Sohrab, let alone compete internationally.

The problem with Sohrab is that they are a co-operative society and they have shareholders interest to look after. According to market surveys, there are some 240 shareholders of Sohrab and each shareholder is getting roughly Rs20,000-22,000 per month per share. In order to compete internationally, they will have to lower prices, increase quality and increase technological investment. All these steps will cut into their profit margins and decrease the earnings per share. If the EPS falls then the shareholders can replace the management committee with new members.

Secondly, most of the members of the co-operative society are also the retailers/sellers of bicycle and are not well educated. They are not willing to take the risk that is associated with exporting to the African countries, as the terms of payment are credit based. They went to a trade exhibition in Kenya 2 years ago and they found a party, which wanted to buy their bicycles on credit. The party is the authorized dealer of Phoenix of China, Atlas of India and Avon of India. Sohrab informed us that if the party does not pay, then they will have to submit the dollars from their own pocket to State Bank of Pakistan. Hence they do not want to export to that party in Kenya.

Third, we feel that they are complacent and slow to react, within and outside the Pakistani market. They had actually stopped their fancy bicycle production for a period of 2 months. The market rumor was, they had done that because they were facing tough competition from Hero Sports cycle, which is a new player and is producing mostly fancy bicycles. Even Hero's standard roadster bicycle has plastic molded saddle and multiple colors, which is an innovation in the roadster model. When we asked Sohrab about the production stop, they said that they did that to get new designs of MTBs in the market as the old ones have been copied.

Currently, the import of bicycles from India is not allowed. It is amongst those items whose import is banned from India as is the case with steel. We feel that if bicycle import is allowed, we may not be able to compete with Indian bicycles as they are cheaper to import even after paying a 25% import duty. Knowing that it is a banned item has led Sohrab to be complacent.

4.8 Success Stories from Outside Pakistan:

4.8.1 Country wise Analysis:

Chinese and Indian Industry:

There is a lot of similarity between the markets of China and India and hence these two markets have been combined to discuss their bicycle industry.

Both China and India have a very large internal market of bicycles and hence their manufacturers have the instant advantage of economies of scale. They also have the

advantage of raw material, which is produced locally and cheap labor, both of which add to cost saving.

Both Indian and Chinese local markets are shrinking so they will have to move towards exports to sell their surplus production or they will have to decrease production. For this reason, they are trying to buy plants abroad to expand. Avon cycles of India has bought a plant in Tanzania for which Phoenix bicycles of China and Hero bicycles of India also bid.

China and India are not into high-end value added bicycles although they are moving in that direction. Hero bicycle of India has recently introduced a full suspension bicycle, which is nearly a 1/3rd less in price than comparable Taiwanese bicycles. The difference lies in the material being used. Taiwanese bicycle uses Aluminium casing while Indian bicycle uses steel casing. Both these bicycles are available in Pakistan, with Hero costing Rs8,000 and Taiwanese bicycle costing Rs12,000-15,000, depending upon the brand.

Taiwanese Industry:

The local market of Taiwan is approximately 600,000 units per annum, which is roughly the same as Pakistan's but they are exporting nearly 9 million bicycles per annum.

Taiwan is into value added bicycles and spends a huge amount of time and money into developing newer, better and lightweight components. They have private organizations and non-profit research organizations like Taiwan Bicycle Industry R&D Center (TBIRDC) to help the industry develop better products. Due to these efforts, they have managed to develop a folding electric bicycle weighing 17.5 kilograms, less than the average 25 to 30kg.

They have National Awards for innovative bicycle products sponsored by Taiwan Bicycle Exporters Association (TBEA) and China External Trade Development Council (CETRA). TBEA is urging the bicycle manufacturers to manufacture a complete bicycle weighing just 7.9kgs by using Magnesium Alloy which is lighter in weight than Aluminium alloy but stronger. This will be used in Frames, Front Suspension, Chain wheels, hubs, stems, handlebars and seat posts to reduce the weight but increase the strength of the bicycle.

Taiwan bicycle companies have diversified by establishing factories in Europe, to bypass the anti dumping law and in China to avail the cheap labor and reduce their production costs.

4.8.2 Company wise Analysis :

Hero Cycles Limited (Hero Group - India):

Hero Cycles Limited was the first company of the Hero Group. It has established itself as the largest manufacturer of bicycles in the world since 1986. Starting with modest figure of 25 bicycles a day in 1956 at Ludhiana, the company extended its wings to establish its second unit in Sahibabad (U.P.), and today the combined production of both the units is more than 16,500 units per day. The annual production figures went up as high as 4,650,000 units in 1998. Hero has a nation-wide dealer network comprising over 3,500 bicycle dealers.

The massive Hero Cycle plant at Ludhiana houses the centralized rim-making facility for the entire range of Hero two-wheelers which includes Mopeds. Besides all major components, it has in-house facilities for making pedals, handlebars, chain wheels, brakes and saddles. In the quest for technology up-gradation they have set up a special plant; like Gujrat Cycles Ltd. to meet international quality standards. In view of the radically divergent needs of the international bicycle markets, the Hero Group promoted Gujrat Cycles limited as a 100 percent export-oriented unit. A joint venture with the State-owned Gujrat Industrial Investment Corporation, this manufacturing division of the Group caters to the needs of sophisticated markets like the United States and Germany, and is now poised for entry into the markets of the UK and Australia. With state-of-the-art equipment imported from Europe and Taiwan, the unit is comparable to the best in the world, and is designed in line with the international practice of dispatching fully assembled cycles from the factory, another first for an Indian company.

Highway Cycle Industries limited a subsidiary of Hero Group was established with a view to manufacturing high quality freewheels to meet the growing production demands of Hero Cycles. Initially manufacturing single-speed free-wheels, the Company began

production of multi-speed freewheels in 1978, essentially to cater to the demands of foreign buyers. Producing about 30,000 freewheels per day, the Company enjoys a leader's status, and meets the exacting quality specifications of markets in Italy, Germany, France and buyers in South America. Presently, the Company exports 100 percent of its multi-speed and 30 percent of its single-speed freewheels.

Rockman Cycle Industries Limited is another Hero venture for self-reliance to cater for the extreme scarcity of cycle chains in India. Starting with 500 lengths of chains per day, the Company today manufactures about 25,000 single- and multi-speed chains everyday, exporting about 25 percent of its total production. In 1964, the Company began the manufacture of bicycle hubs, and today has a daily production of about 50,000 pieces. Rockman products have become well known in the bicycle industry in India and abroad, catering to the needs of some of the finest bicycle manufacturers in Europe. Equipped with the best technology for its requirements, the Company also has its own design and machine manufacturing section, nickel plating plants and a fully-equipped heat treatment department.

Hero Group also have their own Cold Forging Facility in addition to a Reversible Cold Rolling Combination Mills established in 1990 with a Capacity of 120,000 MT per annum with state-of-the-art features like:

- Hydraulic Auto Gauge Control
- Computerized Pass Schedule
- Auto Slow Down
- Elongation Measurement Control

And Downstream Facilities

- Hydrogen Annealing
- Cut to Length machine with an accuracy of 0.5mm on length
- C R Slitting line to have free edge conditions

Traditionally, few Indian bicycle manufacturers were interested in exports, being content with the country's internal market. Hero initially started its exports to Africa and Middle East in 1963, today more than 50% of its bicycles are being exported to the sophisticated

market of Europe and USA. Hero cycles has a clear market in the domestic arena besides having a fair representation in more than 60 international markets. In addition to this Hero is the largest exporter of two-wheelers in India.

The wide product range caters to the entire spectrum of buyers, and includes:

1. Roadsters (06 models; sizes from 20" to 26", both for ladies and gents),
2. All Terrain Bikes (13 models; sizes from 20" to 26", both for ladies and gents),
3. City Bikes (04 models; sizes from 21" to 26", both for ladies and gents),
4. Kids Bikes (11 models; sizes from 21" to 26", both for ladies and gents).

In addition to this, health equipment and bicycle components are also being sold in the market.

Major reasons for Hero cycles Ltd. growing as a leading player in world bicycle industry may be listed as below:

- A thorough understanding of fast-changing consumer behavior, new market segments and product opportunities.
- Development of a marketing mix sensitive to changing customer needs.
- Use of dealership as a catalyst for growth and a bridge between the customers and Hero Cycles Ltd.
- Promotion of more than 300 vendors to achieve quality and economy.
- Appropriate product development and exacting quality standards helped achieve penetration in export markets.

Meghna Cycles Limited (Meghna Group - Bangladesh):

Meghna Cycles Limited was established in 1974 to manufacture bicycle parts and later to develop into a complete cycle manufacturing unit. It has established itself as the only

major assembler of bicycles in the country enjoying monopolistic status in addition to a few small assemblers with negligible production. Meghna Bangladesh has a share of 60% of the domestic market, whereas, the rest of the market is of the imported bicycles. They are also manufacturing cycle parts such as rims, spokes, frames, mudguards, handlebars, steel balls and chains. Of these only the spokes are exported to Malaysia. Local distribution is carried out through the authorized dealer network. They produce their brand PRINCE, which is sold all over country through its 60 to 70 dealers. Meghna Bangladesh is also the sole distributor of Chinese PHOENIX Bicycles. Since 1992 Meghna has initiated 4 more subsidiaries manufacturing Bicycle rims, Ball bearings, Chains, Handlebars and Steel balls.

Meghna Cycles Ltd. claims that theirs is an Environment friendly production system based on recycling to the highest possible extent. The waste materials are treated before disposal and child labor is also avoided.

Meghna Bangladesh has entered into joint venture agreements with Innova of Thailand for production of Bicycle and Motor Cycle tires and with Universal Cycle U.K. to produce 20,000 units per month at its new manufacturing facility. This unit will work as exclusive export unit.

At the four-day fair 'Interbike Expo '97' held at Anaheim City of US, Meghna bicycle was been highly acclaimed. More than 850 bicycle manufacturers from all over the world participated in that exposition.

The product range caters to the entire spectrum of buyers, and includes 16 models of varying sizes including Fancy and Standard Bikes.

There is a lot of similarity between the market scenario of Meghna bicycles of Bangladesh and Pakistan's Sohrab bicycle. They were established much later than Sohrab's but they have expanded much faster and are now in a better position to export their bicycles.

Chapter 5. State of Pakistani Industry

5.1 *Pakistan Bicycle Market:*

There are approximately 300 bicycle vendors in Pakistan, employing 3000 workers. These vendors buy raw material worth Rs.49 million and after value addition sell it on to the manufacturers for Rs.98 million, a value addition of 100%. The 300 vendors supply to 7 big Original Equipment Manufacturers (OEMs) and 20 unorganized OEMs (small firms). These OEMs employ a total of 5000 workers.

According to SMEDA market research, the OEMs supply a further of Rs.1.32 billion worth of 658000 bicycle at an average price of Rs.2000, of new bicycles and Rs.100 million worth replacement parts of bicycles to the retail assemblers/dealers/puncture shops. Sohrab supplied Rs.77 million worth of spare parts in 1997-98, so we are assuming the Rs100 million spare parts figure.

The retailers are supplied spare parts (including tires and tubes) through some 175 component manufacturer, employing some 4000 workers in a market worth Rs.230 million as new parts, @ Rs.350 per bicycle, and Rs.1.62 billion as the replacement market, @ Rs.350 for 4636000 bicycles.

According to rough estimate, there are some 3000 retailers/assemblers, employing roughly 9000 people. These retailers cater to the Rs.1.71 billion, 658000 bicycles at Rs.2600, new bicycles demand and Rs.2.78 billion, 4636000 @ Rs.600, replacement bicycle market.

The annual foreign bicycle market is worth Rs.1.29 billion @ Rs.3000/bicycle, consisting of some 429,000 imported and smuggled bicycles. The foreign parts bicycle market is worth another Rs.1.19 billion, 1978000 bicycles @ Rs.600 per bicycle.

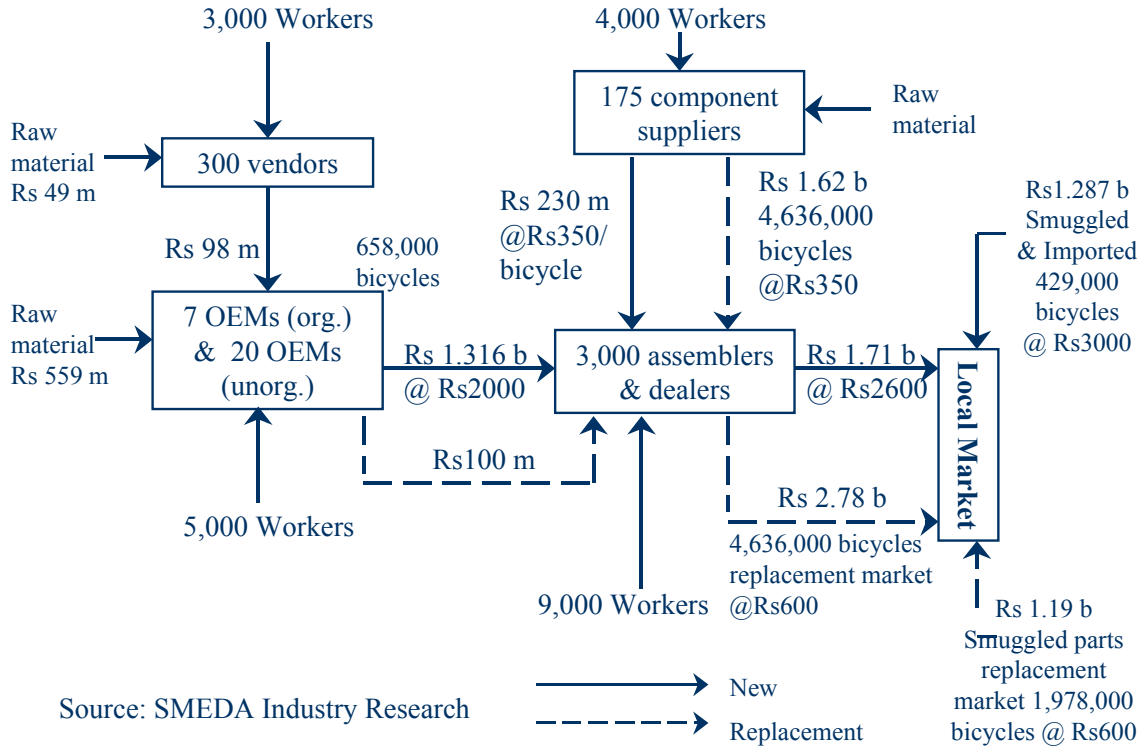


Figure 21: Pakistan Bicycle Industry Overview

5.2 Per Capita Figure:

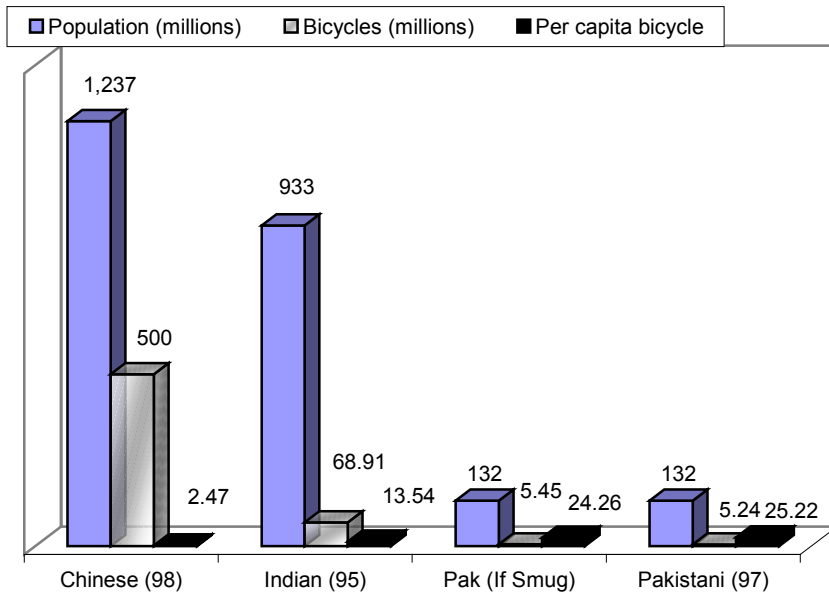


Figure 22: Bicycle Ownership in China, India and Pakistan.

According to a *newspaper article appearing in China Online*, dated 24th June 1999, China has more than 500 million bicycles. The population of China in 1998 was 1,237 million. Thus indicating that per capita figure of 2.47 people to a bicycle.

From the 1995 figures, India's population was 933 million and the number of bicycles was 68.91 million, indicating a per capita figure of 13.54.

Pakistan's population in 1997 was 132 million, bicycles 5.24 million, resulting in a per capita figure of 25.22.

The bicycle figures for Pakistan and India are based upon their official bicycle production figures for the last 10 years taken from their Statistical Agency. Pakistani figures do not take into account smuggling of bicycles into the country from Afghan Transit Trade (ATT); Chinese bicycle containers heading towards Afghanistan are opened inside the jurisdiction of customs at Jamrud Fort/Hayatabad.

If smuggling is taken into account, then the scenario for Pakistani market ownership of bicycles figure improves by 1% to 24%.

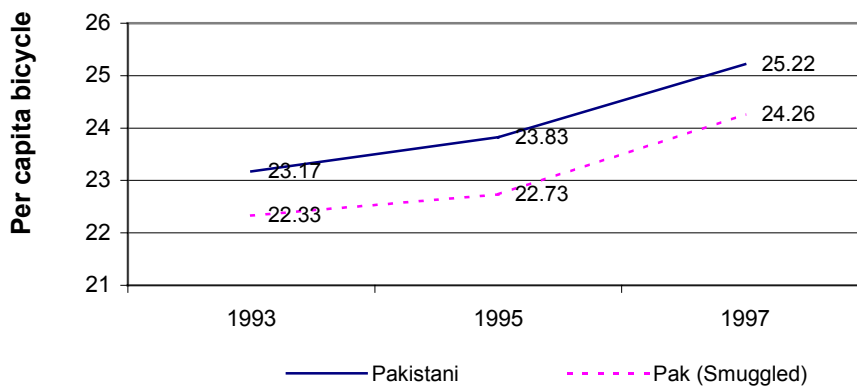


Figure 23: Bicycle Ownership in Pakistan 1993-97

In 1993 per capita bicycle figure was 23.17, which rose to 23.83 in 1995 and to 25.22 in 1997; which means considering the population growth, the sale of bicycles have actually dropped.

The per capita figure was taken by dividing the population by the number of bicycles in that year. The population of Pakistan was taken from the US census data of all countries. If one assumed that all the bicycles being reported outwards through Afghan Transit Trade (ATT) were smuggled back into Pakistan and were consumed in the Pakistani

market, then the per capita figure for 1993 was 22.33, in 1995 was 22.73 and in 1997 was 24.26.

Thus, the per capita figure varies from 24.26-25.22. It is not possible to accurately ascertain the per capita figure, as bicycles are not registered.

5.2.1 Per capita figure of other countries:

Country	Total Bikes (000's)	People per bike (96-97)	Country	Total Bikes (000's)	People per bike (96-97)
Austria (1995)	5000	1.5	Japan	72740	1.7
Brazil	40000	4.0	Netherlands	16500	1.0
Belgium	5000	2.0	Portugal (1991)	2322	4.26
Denmark (1988)	5000	1.02	South Korea	6500	2.6
Finland (1988)	3000	1.59	Spain (1988)	9000	4.35
Germany	63000	1.3	Switzerland	3800	1.8
Italy	26500	2.2	UK (1995)	18000	3.33
Indonesia	20000	9.6	USA (1994)		2.22

Figure 24: Bicycle Ownership in Various other Countries

Source: Interbike Directory, International Directory, ECF/UITD (Final Report)

These figures indicate a marked contrast between the bicycle ownership of developed countries and developing countries. Nearly 2/3rd of world bicycle production is in Asia, but it is used most in developed countries.

5.3 *Installed Capacity:*

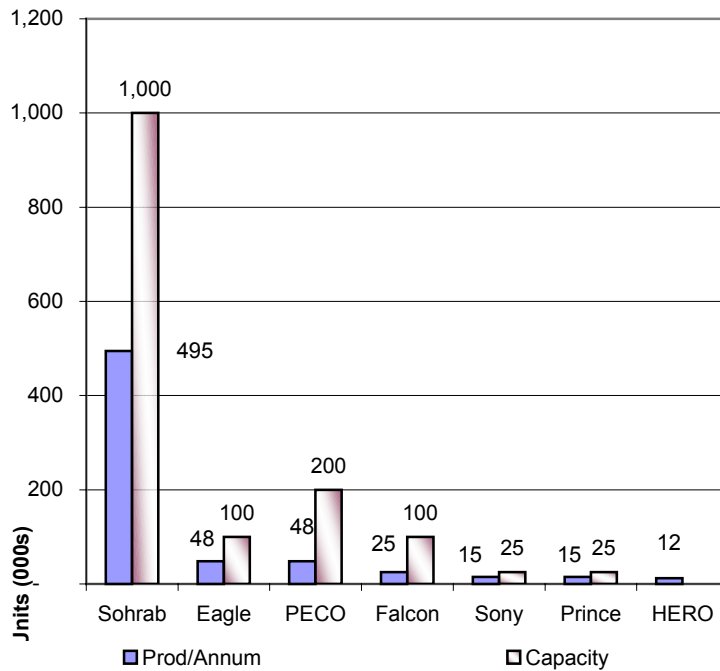


Figure 25: Installed and Utilised Capacity in Pakistan

Sohrab has the biggest capacity of producing bicycles at 1 million per annum. PECO (Pakistan Engineering Company) which is a nationalized company has the 2nd biggest capacity of 200,000 bicycles per annum. Eagle is the 3rd largest in terms of production capacity at 100,000 bicycle units per annum. The total installed capacity of bicycle plants in Pakistan is approximately 1.45 million bicycles per annum.

The figure above shows the production and capacity of the six major OEMs in Pakistan. Other than Prince, which is located in Karachi, all are based in the vicinity of Lahore.

This year, another bicycle manufacturing unit has been set up in Lahore, which is working mostly through vendorisation process. They are manufacturing mostly fancy bicycles at approximately 3,000 bicycles a month, under the name of Hero Sports Division. Hero's capacity is undetermined because they did not inform us about their manufacturing potential and neither have they shown us their factory.

5.4 *Capacity Utilisation:*

Of the total annual capacity of 1.45 million bicycles, roughly 658,000 bicycles were produced in 1998-99, showing a figure of 45.4% capacity utilization. Sohrab, the largest

bicycle manufacturer in Pakistan, has a utilization figure of nearly 50%, while Prince and Sony which together accounted for nearly 8% of the total production have a capacity utilization of 60%. Eagle was working on nearly 48% capacity utilization, while PECO and Falcon are working at approximately 25% capacity.

5.5 **Capital Investment:**

Market for Bicycle parts-New & Replacement	
Total Bicycle Production for 10 years	5,294,000
Avg. Yearly Replacement cost	200
Yearly Replacement Market	1,058,800,000
Average life of tire	1 year @120/tire
Average life of tube	6 months @40/tube
Cost of tire and tube over the year	400
Yearly Replacement market	2,117,600,000
Total Yearly Replacement market	3,176,400,000

Table 9: Replacement Market for Bicycle Parts

The market for bicycle parts has been estimated by taking Rs600 as the cost of parts that are replaced during a year. This includes Rs240 for a pair of tire and Rs160 for 2 pairs of tube. A tire cost can vary from Rs.70 to Rs150 per tire. The popular brands are in the region of Rs130-150. We have averaged a price of Rs120 per tire, which we feel is on the accurate side.

Similarly, the price of a tube varies from Rs35-45. We have taken the price of a tube as Rs40 as the more popular brand feature in that price range.

We feel that no tire lasts longer than one year and no tube lasts longer than 6 months and hence the Rs400 cost of replacing tire and tube annually.

Similarly, the Rs200 cost consists of carrier, stand, bell & lock in case of a new bicycle and pedals, front fork, reflectors etc. in case of an old bicycle.

Market for Smuggled Bicycle parts-New & Replacement			
Total bicycle smuggled	2,407,000		
Avg. Yearly Replacement cost	200		
Yearly Replacement Market	481,400,000		
Average life of tire	1 year	@120/tire	
Average life of tube	6 months	@40/tube	
Cost of tire and tube over the year	400		
Yearly Replacement Market	962,800,000		
Total Yearly Replacement Market	1,444,200,000		

Table 10: Replacement Market for Smuggled Bicycle Parts

Similarly, the cost to replace the tire and tube of a Chinese bicycle is Rs400 annually and its part is Rs200 and hence the yearly market is worth approximately Rs1.44 billion.

Installed Capacity (units)	1.45 million
Capacity Utilization	45.40%
Total Sales Market	Rs7 billion
Total Workforce	21,000
% Vendorization by	14
No. of Vendors	300
Market Size (units)	1.08 million
Market Size	Rs2.99 billion
Replacement Market	Rs3.97 billion
Export Rebate per Bicycle	Rs. 176
Export Rebate on Parts	4.6% of FOB
Export Rebate on Tires	Rs339.70/100 piece
Export Rebate of Tubes	Rs349.03/100 piece

Figure 26: Capital Investment and other Market Related figures

5.6 Workforce Employed:

According to SMEDA market research, the total number of people employed in the bicycle industry is approximately 21,000 people. This figure does not include those people who work along the roadside fixing and selling bicycle spare parts and puncture repair shops, as those are in the unorganized sector and it is not possible to count them.

5.7 Market Size:

Assuming that all the bicycles being reported outward through Afghan Transit Trade (ATT) come back into Pakistan, the total number of bicycles produced by Pakistani manufacturers was 658,000 while that being smuggled into Pakistan amounted to 429,000. Thus indicating a market size of 1.087 million in 1999. The figures for ATT were provided by Customs office, Peshawar.

In 1998, the market size using these assumptions was 1.283 million, with 673,000 bicycles coming through the ATT.

For the last 10 years, the average growth rate of Pakistani bicycles is 4% while that of bicycles coming in through ATT is 48%, indicating an overall growth rate of 13%.

Year	Pakistan (000's)	% Change	ATT (000's)	% Change	Total (000's)	% Change
1989-90	530				530	
1990-91	429	-19%	56		485	-8%
1991-92	478	11%	61	9%	539	11%
1992-93	574	20%	196	221%	770	43%
1993-94	564	-2%	237	21%	801	4%
1994-95	474	-16%	255	8%	729	-9%
1995-96	545	15%	293	15%	838	15%
1996-97	432	-21%	207	-29%	639	-24%
1997-98	610	41%	673	225%	1283	101%
1998-99*	658	8%	429	-36%	1087	-15%
Total/AV	5294	4%	2407	48%	7701	13%

Table 11: Bicycle Production in Pakistan and Afghan Transit Trade

Taking the age of bicycle as 10 year, the total production of Pakistan during the last 10 years (from 1989-1999) has been 5.3 million. The data about Afghan Transit Trade (ATT) has been collected from Customs Post, Peshawar. In our model we have assumed that all these outward reporting bicycles are being smuggled back into Pakistan.

Combining the two figures, we estimate that there are roughly 7.7 million bicycles in Pakistan, of which 5.3 million are Pakistan Manufactured and 2.4 million are Chinese Manufactured. This indicates that Chinese bicycles have nearly a 31% share of the overall Pakistani market.

5.7.1 Bicycle Ownership:

According to a survey done by Pakistan Advertisers Society (Dawn 4th June 99), 31% of the urban households have a bicycle. The latest population and census results show that:

	Households	Male	Female	Both Sexes
Urban	6,250,388	22,419,286	20,039,053	42,458,339
Average Urban Household Size	6.79			
Total Bicycles	1,937,620			
Rural	13,450,956	45,420,851	42,700,381	88,121,232
Average Rural Household Size	6.55			

Table 12: Household and Bicycle Ownership

31% of the total urban households indicate a figure of 1.94 million bicycles in the urban areas. We are assuming that there are 7.7 million bicycles in Pakistan and hence by our assumption, there are roughly 5.76 million bicycles in the rural area, indicating that 43% of the rural household own bicycle.

5.7.2 Demand of Bicycles:

Assuming that 25% of the male labor force require bicycle, then according to the latest figures:

	Labour Force (million)	Urban (million)	Rural (million)
1998-99	39	10.47	27.71

Table 13: Labour Force of Pakistan 1997-98

Hence the number of bicycles required are 9.8 million.

This indicates an unfulfilled demand of 2.1 million bicycles.

In the next chapter, we have shown that the market needs to grow at 12.30% whereas it is growing at a rate of 13%. This does indicate a backlog of demand that is being fulfilled albeit at a slow rate.

5.8 Market Segmentation:

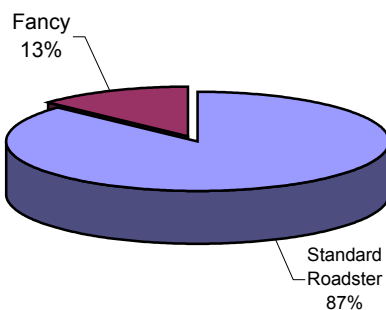


Figure 27: Market Share by Bicycle type

The bicycles manufactured in the Pakistani market consist of 87% roadsters and 13% fancy cycles. Most of the Pakistani bicycle companies make at least 2 models of the popular roadster bicycle. The most popular of the roadster model is the Double bar roadster, which comes in sizes of 24 inch, 22 inch and 20 inch. The double bar roadster consists of nearly all of the roadster market. The Chinese bicycles that are being smuggled into the country are Standard Roadster bicycles, measuring 22 inches along with light, dynamo and pump arrangement.

In big cities like Karachi and Lahore, the difference between the market share of standard and fancy bicycle is decreasing. In these cities, fancy cycles and standard cycles are being bought at an equal rate, thereby reducing the existing difference between the standard and fancy bicycles market share.

5.9 Share of Market:

Sohrab is the current market leader with approximately 47% of the market. It has been the market leader since its establishment in 1953. In 1998, its production was 450,000 and in 1999, they have increased it to 495,000. PECO and Eagle have lost their market share, percentage wise. The loss in market share has been attributed to internal organizational problems being faced by these two companies. PECO is a State Enterprise Unit and does not have funds, while Eagle has had a management change.

The 1999-market share of different brands of bicycle looks like:

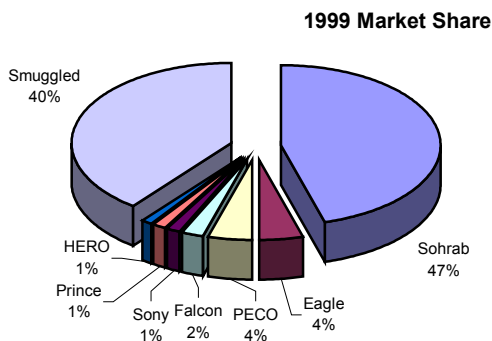


Figure 28: Market Share of Bicycle Manufacturing companies in 1999

Note: Sony only makes fancy bicycles.

5.10 **Lahore Bicycle Retailers Market:**

The Lahore bicycle market is situated at Nila Gumbad, which deals in Retail, Wholesale and Individual sales. On an average, a retail shop sells 4 bicycles a day. There are about 100 shops in the market selling bicycle and its components. The average profit is Rs.250 on a Pakistani bicycle and Rs.70 on a Chinese bicycle. According to the seller, bicycle sales are seasonal and related to a number of factors:

High Sales Period	Low Sales Period
After exam results	Before exams
After harvesting of crops	During planting season
During summer season	During cold winter days
Beginning of each month	Rainy Days
	During Ramadhan month

Most of the retailers have been in the business for a long time and their business is built around references, as they offer more or less the same products at the same price. They have a Lahore Cycle Dealers Trade Group, which helps them to maintain price. Some of the retailers are shareholders of PCICS, which makes them cahoots with Sohrab. Thus, the price of bicycles can be artificially inflated/manipulated. During our visits to the Nila Gumbad market we found out that many shop owners were also the shareholders of PCICS.

5.11 **Customer Profile:**

5.11.1 Urban:

In 1990's – The delivery people have mostly switched to motorcycles. The urban young people are turning towards fancy bicycle. In urban areas, the ratio of fancy bicycles to standard bicycles is 50:50. This ratio has been more or less constant over the years, probably due to a large number of imported fancy bicycles. The fancy bicycle cost ranges from Rs.3200, for a Pakistani manufactured bicycle, to Rs.15000 for an imported bicycle with suspensions. The people who buy standard bicycles are the low salaried workers who cannot afford to commute using public transport. These also include those people who do not have a job and are willing to go places in order to find a daily job, mostly construction work or work as farm hands.

5.11.2 Rural:

In 1990's – In the 1990's, the delivery people had switched over to either public transport or motorcycles with bicycle being used by workers of landlord and rural job shoppers.

5.12 **Resale Price:**

The resale price of Pakistan made bicycle, which costs Rs.2600-2700 at present, is less than the resale price of a Chinese smuggled bicycle, which costs Rs.3600. People consider Chinese make bicycle good value for money, also it has extra features and hence the resale price is higher.

5.13 **Average age:**

The China made bicycles are lightweight and aesthetically pleasant than those made in Pakistan. Chinese bicycles are not heavy load carriers but are mostly bought because of resale value, finish quality, accessories and aesthetics. There is a tendency amongst the customers of Chinese bicycles to spend more time on cleaning their bicycles than owners of Pakistani bicycles.

The average age of a bicycle varies with the time and amount of maintenance spent but for our model, we have assumed the average age to be 10 years. This is not an absolute figure as people have a tendency to pass on their bicycle to the next generation or sell it at a low price.

5.14 **Bicycle Maintenance Cost:**

The biggest maintenance cost incurred by bicycle owner is tire, tube and punctures. Depending upon the quality and usage, the life of a tube can vary from 3 months to a year. A tire can last from 6 months to 2 years.

The two most breakable items encountered by customer were pedal and front fork. Depending upon the usage, maintenance cost could vary from Rs.30 to Rs.200 in a month, as told by people in the survey done by SMEDA's Light Engineering section.

There was a tendency by Chinese bicycle owners to overhaul their bicycles or clean it more often than Pakistani bicycle owners.

Sohrab and Hero brands have now started giving a five-year guarantee on their bicycles. Sohrab's guarantee asks the person to give some money after six months period.

The large annual entry and presence of Chinese bicycles does indicate that the guarantee is not all that important to a customer, but more important features are finish quality, styling, status upgradation, value for money and extra accessories. Smuggled Chinese bicycle despite absence of guarantee is a great seller in the market especially with North Punjab and the two provinces of NWFP and Balouchistan.

Chapter 6. Key Players

6.1 Current Bicycle Manufacturers:

The following is the list of bicycle brands manufactured in Pakistan:

- Sohrab
- PECO
- Eagle
- Falcon
- Prince
- Sony
- Hero
- Unorganized Sector

Of these, there are three major players in the bicycle industry in terms of past performance of sales, quantity produced, installed capacity and market share.

Sohrab

PECO

Eagle

6.1.1 PCICS, Brand Sohrab:

PCICS is the biggest manufacturer of bicycles in Pakistan and produces most of its bicycle parts in house. They were established in 1953 and produced 60% of all bicycle in Pakistan. They hold 48% of the market in which 40% belongs to the Smuggled bicycle market. They have recently started exporting bicycles. Their first two orders were for USA and UK for fancy and standard bicycles respectively, as one container load each.

They have the best manufacturing processes amongst the large players and have a capacity of roughly 1 million bicycles per annum. The major bottleneck in Sohrab plant is their electroplating capacity as their current three electroplating plants can cope with roughly 70% increase in demand but not to 100% extent. To achieve 100% production another plating plant will have to be bought.

They are using bulging process, which has effectively reduced the number of processes and pieces required to make joint components for frame assembly and are the only manufacturer who are making their own freewheel. All the other manufacturers are importing freewheel from China. Sohrab are also selling their free wheel in the local market.

Bicycle chain and steel balls are the only imported items used in Sohrab brand standard bicycle assembly. For fancy bicycle, they are importing the multiple freewheel and brake sets.

Of the bicycle manufacturing plants in Pakistan, Sohrab is the biggest, which can cope with the increase in demand. The other manufacturers can cope with an increase in the demand but not to the same extent, as their assembly units do not have automated part-manufacturing facilities.

6.1.2 PECO, Brand PECO:

PECO is a nationalized company, currently in the process of being privatized. Although they have a re-rolling mill and a tubing mill of their own, but they are not in a financial as well as a mental position to manufacture bicycles at a large scale, because of their privatization process. One of the reasons why their bicycles are not doing well is that they do not deliver on time and are delivering the bicycles at a higher cost than their competitors to their retailers. Their cost at present is Rs.600 higher than other bicycle assemblers.

PECO has an improved plant and if they are privatized, then things can improve as PECO has the capability of producing extra number of bicycles without investing in new machinery and by running the plant in two shifts.

PECO, the second big manufacturer, are facing monetary problem and the overheads of their bicycle are too high.

6.1.3 Capital Industries, Brand Eagle:

Eagle has a small plant and was recently bought out by Diamond Group of Companies, who manufacture their own bicycle tires and tubes. Previously 2 family members who started bicycle assembly operations in 1953 were running the plant. They had brought in some personnel of PCICS.

The problem with Eagle bicycle is that they do not have the required space to expand their operations. Even at their current production level, their factory looks crowded and may not be able to increase their production by more than 20% at the current premises.

The new management plans to increase production and move the factory to new premises. The new management was also contemplating about providing tires and tubes with their bicycles.

In order to increase production, they will have to invest in machinery, paint shop, heat treatment process and conveyors to carry bicycle parts. Eagle-Capital plant is mostly manually operated and may not be able to cope with the demand without raising the labor costs and other overheads.

6.2 Key Parts and Processes:

6.2.1 Bicycle Manufacturing Process:

The main component used in the manufacturing of bicycles is Cold Rolled Steel Sheet (CRSS) and pipe. CRSS is used to manufacture frame, fork, chain stay and other parts used in a bicycle.

Bicycle is made in parts that are then assembled for the final delivery. At the delivery time, the bicycle does not contain tires and tubes which are supplied at the retailer stage, this is unlike India where we understand manufacturers supply their own branded tire and tube.

A standard bicycle available in the market does not contain carrier, bell, stand or a lock; these are added at the retailer stage, which can cause confusion to the customer who is buying the product for the first time in the market.

The major parts and process involved in bicycle manufacturing are:

Frame:

Pipes are bought from outside vendors. PECO is the only company, which manufacture their own pipes. Sohrab and Capital buy them from vendors. These are supplied covered with oil so as not to rust. They are then covered and washed with kerosene oil, wiped with sawdust and cleaned.

The pipes are notched and shape is rounded. A double bar seat lug is attached (this is only for a double bar bicycle). A BB (Bottom Bracket) shell and head tube are added on. Brazing (joint welding) is done. Eagle has one person doing brazing and Sohrab have 3

different sets of people each doing one joint at a time. Chain stay assembly is then done after brazing operation is completed. The whole assembly is then taken through the phosphating operation (whose tank is changed after 3 months). The joints are then filed. The methodology is slightly different for Eagle and Sohrab but they both eventually use the same processes.

Front Fork:

These are basically 3 basic tubes, which are reinforced, their crowns pressed and punched.

Rim:

Sohrab has an automatic rim-rolling machine. The machine takes a flat steel strip, turns the edges, bends and welds them. The sheet is rolled and a person sits and cuts the sheet according to the required size (with the help of a gauge). The spoke holes are punched simultaneously through a hydraulically operated machine. They also have a person who punches these holes manually for fancy and non-standard rims. They have a polishing machine that polishes the rims.

In Eagle the whole process is done manually. Although they have a rim rolling machine but they do not have an automatic punching machine. They have employed a person who with the help of a manual operation punches hole in rim, while it is mounted on a jig.

Mudguards are also made using a rolling machine and are then cut to the required specific size.



Figure 29: Picture of Rim and Spokes

The major bicycle manufacturing processes are:

Electroplating Plant:

Sohrab has a completely automatic electroplating plant. The parts are loaded from one end and then go through the electroplating process. At the end of the process, they are unloaded from the same end. They have 3 similar plants for different capacity. According to the production in-charge, if the production is doubled, the electroplating plants will not be able to cope with the increase. He said that they might be able to support 65-70 percent of the increased production but not 100% capacity production.

PECO have two similar automatic plants, although one is being used due to low production.

In Eagle, the electroplating process is done manually and hence it is more time consuming and highly labor intensive.

Heat Treatment:

Sohrab has an Italian fully automatic heat treatment plant installed, which has been shut down. The reason for the closure is that the plant needs to be run at full capacity and requires a big load. It also uses electricity, which is costlier than gas. With the dwindling production, the plant is not being used. Although the General Manager was not sure about the cost of the heat treatment plant but he mentioned that a smaller gas powered heat treatment plant (with nearly half the current plant's capacity) was costing between 7 to 8 million rupees in 1985. The gas powered was expensive than a similar capacity electric powered plant but had low running cost. He was sure that the current plant should have cost more than Rs.10 million.

The cycle components are carbonized. All the manufacturers are using furnaces filled with heat treatment salt for heat treatment. For quenching, oil and water tanks are used. Presumably the parts used by most bicycle assemblers are not properly heat treated, which leads to a low wear resistance in many moving bicycle parts and hence the need for more spares.

Finishing/Paint:

Sohrab has a fully automatic painting plant. They first prepare the surface of the part that is to be painted. Polyclean is used for degreasing. Zinc calcium phosphate layer is added for paint purpose. The pores are then sealed with chromic acid. The parts are then passed through an Electro-static spray painting plant. There is one for frame and another for front forks etc. There is wastage of roughly 5% in this process, which is fully automatic. The painted parts are passed through an oven where the temperature is kept between 150-160 degree C. The parts are first sprayed with primer and then re-coated with paint for luster finish.

This is true for only black and green colors. In case of the red color, the paint is sprayed with a manual spray gun. First the part is covered with black paint then an Aluminium colored undercoat is done and finally sprayed with red paint. The same process is applicable for frames with two or more colors.

In PECO and Eagle, the paint is applied manually through spray guns, which have a wastage of roughly 30%.

The problem with fully automatic painting is that the market perceives the finishing of Sohrab to be of lesser quality than their competitors. Sohrab uses the electrostatic plant for painting black and green on bicycles. Sohrab also has manually operated plants that they are using for painting fancy bicycles and red color.

The advantage of painting manually is that the painter can visually check for areas that are left out and repaint them. In case of an automatic system, this is not possible as the parts once painted are moved for baking. The problem with red paint is that an undercoating of silver is done and paint is then sprayed on the undercoating. That is why, a red color bicycle is more expensive than a black/green one.

Chapter 7. Value Chain Analysis

7.1 Vendor's Value Chain:

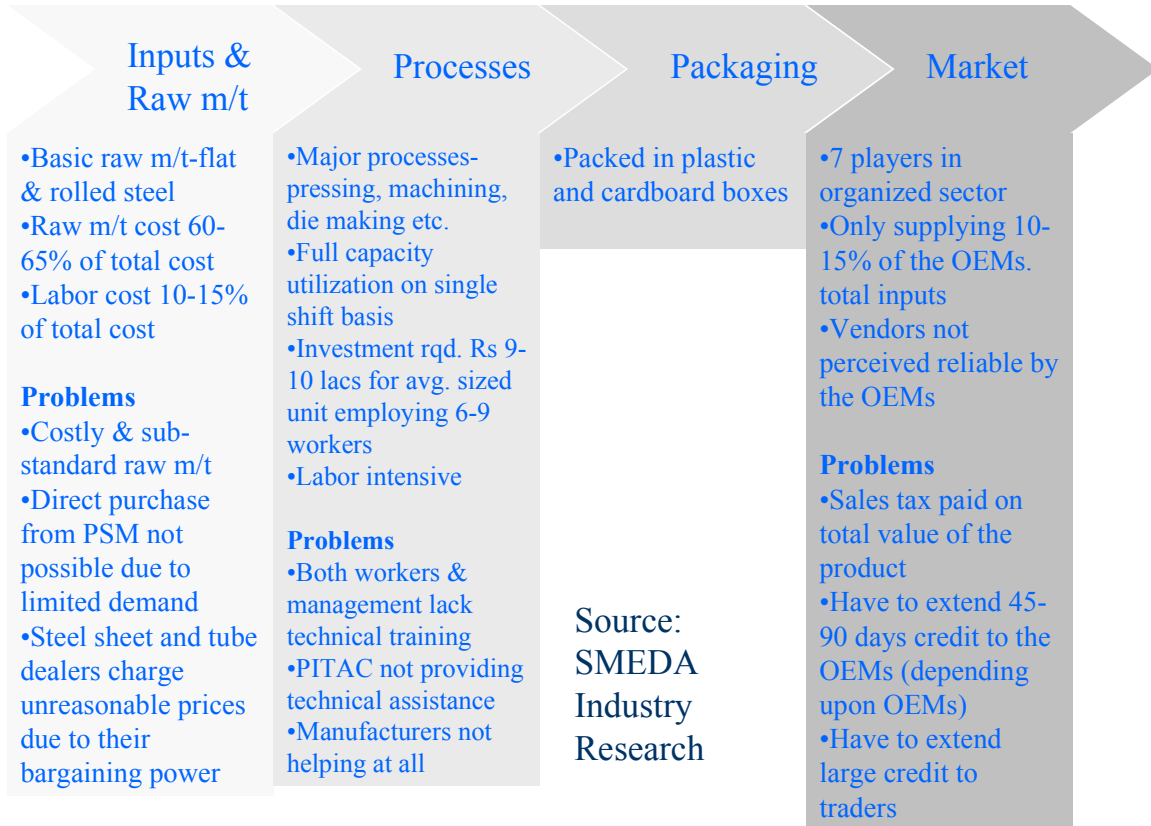


Figure 30: Vendor's Value Chain

The vendors buy raw material directly from the steel sheet market to manufacture parts for the OEMs. They cannot buy directly from Pakistan Steel Mill due to their small quantity requirement. Pakistan Steel Mill does not book any steel order below 100 tons and rolling steel to size order below 200 tons, which is a great hindrance. The vendors have a Parts Manufacturing Association, to which a proposed solution has been given to buy the material in the name of the association and then distribute it amongst the members. Thus, eliminating the middleman. The vendors want SMEDA's help in talking to the Pakistan Steel Mill.

The vendors supply the parts on credit basis. According to the industry, nearly 90% of the vendors do not take loan from institutes to finance the credit. They rather borrow money from people and then pay their debtors when they receive money from OEMs.

7.1.1 Regulatory Bottleneck:

- **Form S**
- **Sales Tax** - Most of the vendors are not sales tax registered. Most of these vendors assemble one part for OEMs or supply only one particular part to the market, hence for them being cost competitive is a high priority. The ones that are paying sales tax already have a cost disadvantage over others. Hence vendors avoid sales tax.

7.1.2 Institutional Bottlenecks :

- **PITAC** - A complaint that the vendors had was that the Pakistan Institute for Technical Assistance and Co-operation (PITAC) was not helping them in any way. They were getting no feedback from PITAC and no technical advice about parts and drawings. PITAC does not offer any assistance in research and development for new components.
- **Pakistan Steel Mills** - Pakistan steel mills does not allow manufacturers to directly order material, if the material requirement is less than a specified quantity. For the purchase of raw material, the vendors have to purchase it from the PSM steel sheet dealers who charge them their high price and charge their commission in the selling price.
- **28 Government agencies** - There are more than 20 government agencies with which a vendor has to deal. These include: Social Security, EOBI, Labor department, civil defence, municipal committee, City development agency, withholding tax, income tax, sales tax, wealth tax, WAPDA, Sui Gas, Railways/PIA, PTCL, Customs, Export Rebate, SBP, PCIS/SIE, District Administration, Ministry of Industrial Provincial/Federal, EPB, Federal Bureau of Statistics, Provincial Bureau of Statistics, Ministry of Science & Technology, Board of Investment.

7.1.3 Technology Bottlenecks :

- **Heat treatment** - None of the vendors has an established heat treatment plant. For this reason, they get their parts heat-treated from the local market, for which they pay

a high price and the heat treatment done is not up to the international standards. A lot of consumers complain about components failing due to improper heat treatment.

7.1.4 Productivity/Skill/Managerial Bottlenecks:

- **Labor Productivity** - The labor working with vendors is mostly on a contract basis and they are neither trained nor skilled to recommend changes in process that can save time, money and wastage. There is no institute that helps and works on skill enhancement for their workers. Even if there was, there will remain a question about sponsorship of those workers as most of them are on a contract basis and not permanent employees.
- **One man show** - Most of the vendors are owner/accountant/purchaser/manger. They do everything themselves and do not have a separate person for manage their operations. They have to deal with government agencies, procurement of raw material, manage operations, arrange for delivery on schedule, meet OEMs for payment etc. A delay in one area may delay everything.
- **Lack of costing skills** -

7.1.5 Marketing Related Bottlenecks:

- **Limited local market** - The market for their products is very limited. Most of these vendors can only survive if they start making products for OEMs and especially for Sohrab. Only if they can align themselves with Sohrab, will they be able to make money. If they cannot supply parts to an OEM, they will have to compete in the market on the basis of price.
- **No Exports** - Right now, the bicycle vendors are not exporting any components. Some of them are looking for export markets but they may not be able to offer a cheap price or a quality product without incurring some development costs.
- **Most Illiterates** - Most of the vendors are not well educated and cannot cope with the technological advancements or changes. They may not be able to correspond properly with foreign buyers and are not familiar with paperwork involved with export registration.

7.1.6 Financial Bottlenecks:

- **Steel Vendors** - Because of their low quantity requirement, the bicycle vendors have to purchase their raw material from PSM dealers who charge a mark up, if steel sheets are bought from them on credit. The rate varies from dealer to dealer but it can be as high as RS3 per kilogram of steel sheet. If the bicycle part vendor purchases the steel sheet on cash, then his money gets stuck in the raw material.
- **Most work on credit** - They supply parts to OEMs on credit ranging from 45-90 days, depending upon the understanding with OEMs. A major complaint by the vendors was that the OEMs does not give them a fixed commitment about payment and pressurizes them to lower their price. Some of the vendors have said that for the amount of money they are being given by the OEMs, they resort to using sub standard material, especially in rubber related parts.
- **Unavailability of Credit** - More than 90% of these vendors borrow money from their relatives, friends in case of urgent requirement and do not resort to bank loans because of the interest involved. According to the vendors, it is not viable for them to pay mark up on credit from PSM dealers and then pay interest to banks.

7.1.7 Potential Threats:

- **WTO** - With the opening of WTO regulations and lowering of trade barriers, bicycle components will start coming into Pakistan. This is especially true for bicycle tire and tubes as Pakistani tire and tubes are relatively expensive compared to Chinese and Indian. There already exists a segment of buyers who prefer to buy Iranian and Malaysian tires which are smuggled as well as legally imported into Pakistan. Although these tires are expensive than comparable Pakistani tires but they last longer and hence are preferred by a segment of the market. The lowering of trade barriers will make these components less costly and hence more attractive to buyers.
- **Child Labor** - Although child labor is not a serious issue at present but there are vendors who use child labor for manufacturing bicycle parts. Child labor is involved in manufacturing of bicycle parts, as they are relatively cheaper than a fully-grown male labor.

- **Smuggling** - Small bicycle components are being smuggled into Pakistan mostly from China. These include mostly free wheels, tires and tubes. Freewheels are also being smuggled into Pakistan from India while tires are also coming from Iran. This smuggling decreases the market for local players, as they are not in a position to offer the same quality product at a comparable price.
- **Opening of trade with India** - An Indian freewheel costs Pakistani Rs28 in Lahore, a Chinese costs Rs45 while a Pakistani, Sohrab brand, costs Rs55-60. Indian manufacturers have an enormous cost advantage over Pakistani manufacturers in the whole of light engineering products. The local vendors will not be able to compete with Indian bicycle components if bicycle trade is opened with India.

7.2 OEM's Value Chain:

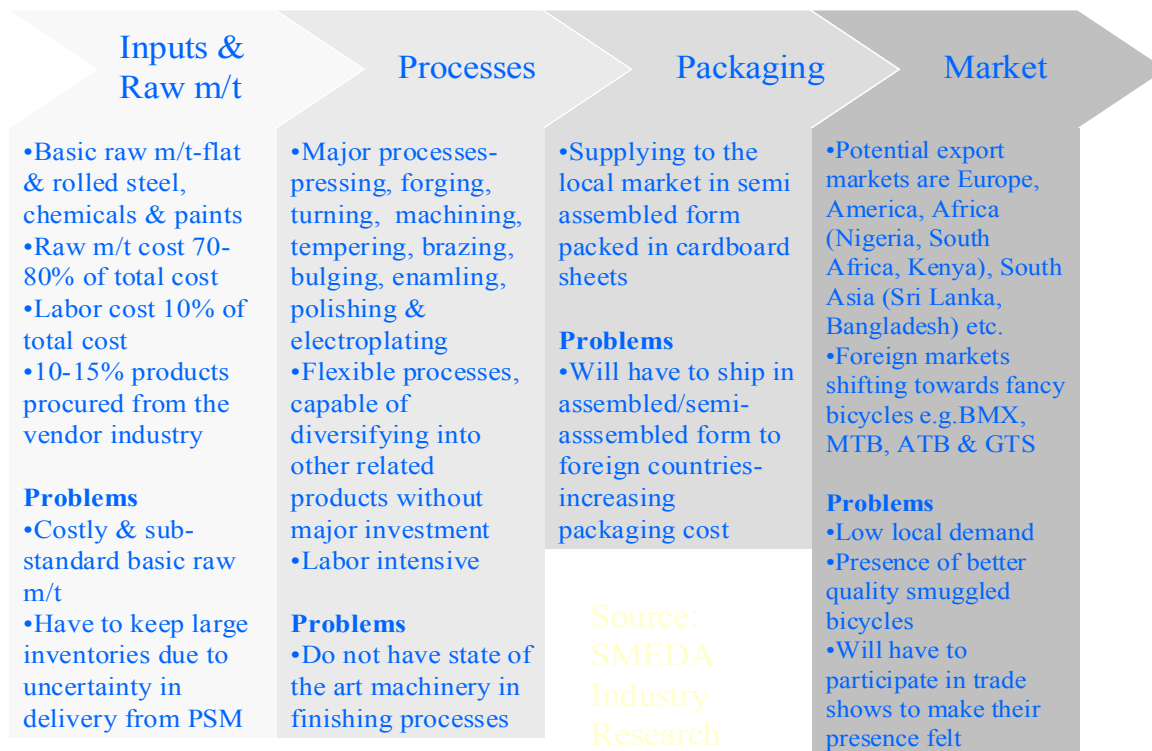


Figure 31: OEM's Value Chain

The manufacturers buy their raw material from local market and import that which is not being produced locally. According to the manufacturers, some 7-8 kg of material in a standard bicycle is imported and the rest is locally manufactured steel. The imported raw materials are mostly Cold Rolled sheets, which are not manufactured by PSM.

Sohrab, the biggest manufacturer, imports directly, while the smaller manufacturers buy the imported material from the local market. The rate of duty on imported raw material is 5%, while that on parts is 10%.

7.2.1 Regulatory Bottleneck:

- **Sales Tax** - Sohrab complained excessively that it is difficult for them to compete with their competitors as their competitors do not pay sales tax, or they falsify their production figures to pay less sales tax. Because Sohrab is importing raw material, they have to maintain their record and it becomes difficult for them to evade tax. So they already start with a 15%-18% cost disadvantage than their competitors.
- **Form S** -
- **Steel Import from India** - Currently, import of steel from India is banned. Steel is cheap in India and is available at the prevailing international prices. The OEMs are currently importing steel from Brazil, South Africa and Eastern Europe, wherever they can get it cheap. The high transport costs of bringing steel to Pakistan end up making the steel expensive than to otherwise import it from India.
- **CBR** -

7.2.2 Institutional Bottlenecks :

- **PSM (special grade material)** - Pakistan Steel Mills do not special grade steel sheets like CR3 and CR4 which are extensively used in bicycle manufacturing processes. These have to be then imported.
- **PITAC** - PITAC does not offer any assistance or training for workers of OEMs. There was a time, when some of the managers at these OEMs were from PITAC but PITAC does not offer any training courses for their workers or a technical collaboration.

7.2.3 Technology Bottlenecks :

- **Chain** - Nobody in Pakistan manufactures chain. There was a party in Karachi that started manufacturing bicycle chains but they too stopped, as it was cheaper for them

to import it from China then to manufacture it locally. Chain is imported in links and those links are joined locally.

- **Pedal Design** - One of the biggest complaints from customers was that they had to replace the pedal of a bicycle every six months. The reason for that is because the pedal is made of two rubber blocks which are screwed onto both sides of the frame. With continuous usage, the nut becomes loose and eventually falls off. This results in the rubber block falling off the frame and hence the pedal has to be changed.
- **Freewheel** - Only Sohrab manufactures its own freewheel while the rest of the OEMs buy it from the local market. These freewheels are Chinese made and costs less than Sohrab's in the open market. Multiple freewheels, which are used in fancy multiple gear bicycles are all imported. These are not manufactured in Pakistan.
- **Brakes (rubber parts)** - There is only one party in Lahore, which supplies rubber parts to all OEMs. This rubber is used for brakes in standard bicycle but not in MTBs. For MTBs, the brakes are imported.
- **Innovation** - No OEMs is spending any time, effort or money on new innovation. This includes thinking of new, cost saving and lightweight material. They are all making bicycles with steel structure. The rest of world is moving towards lightweight Aluminium alloys or Magnesium alloys. Similarly, Sohrab being the market leader should introduce new designs every six months but they are not doing that. For that reason, the designs in the local market are very similar.
- **R&D** - Other than Sohrab, which has a Research and Development section, none of the OEMs spend any money on R&D. Sohrab is also making motorcycles and hence needs the R&D section, while the other manufacturers just copy the design from either what's available in the market or they take it out from catalogues.

7.2.4 Productivity/Skill/Managerial Bottlenecks:

- **Electroplating plant** - Sohrab's electroplating plant is their bottleneck as with the current electroplating plants, they will only be able to go to 70% of their installed capacity. The other OEMs are also under utilizing their plant but Sohrab's plant are fully automatic and their combined capacity is more than all the other OEMs combined.

- **Heat treatment** - One of the biggest problem with bicycles parts being manufactured by vendors or by the OEMs is that they are not properly heat-treated. This results in more replacement parts. Sohrab has a state of the art heat treatment plant, which they are not using and have not used for more than 5 years. The reason for that is the heat treatment plant requires a lot of electricity and huge volume to operate and to make it cost feasible. At the time of buying this plant, they had an option to buy a smaller gas powered plant but they opted for electrical powered plant.

7.2.5 Marketing Related Bottlenecks:

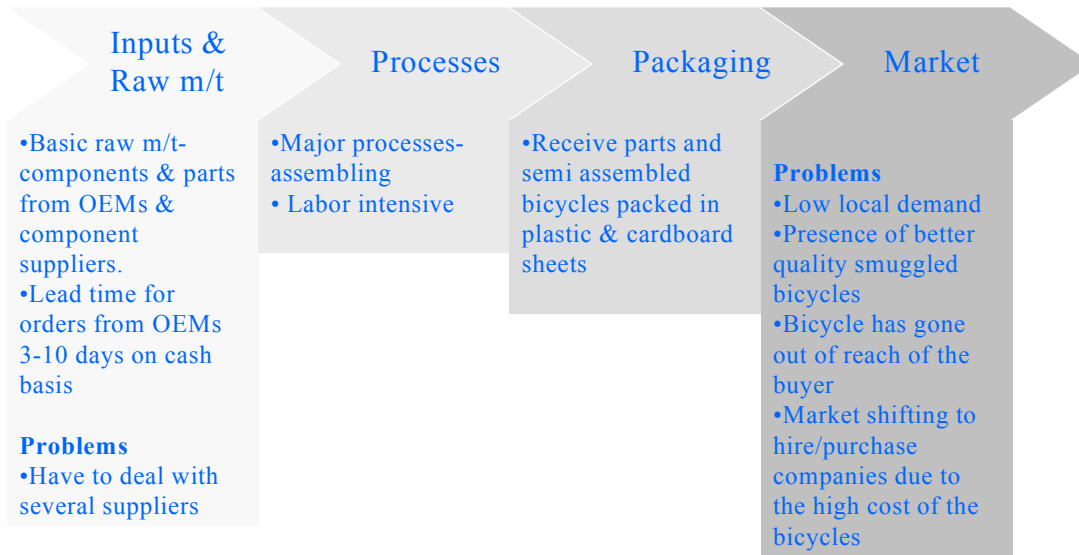
- **Limited internal market** - There exists a very limited internal market to give them the economies of scale that the neighboring countries are generating. This is one of the reasons why Pakistani bicycle costs more than Indian and Chinese.
- **Virtually zero exports** - Pakistan has virtually zero exports in the bicycle sector with Sohrab sending a couple of containers this year for exports. The advantage of having exports is that the customs duty on raw material is refunded and OEMs do not have to pay sales tax on bicycle. Exports, with increase in production, can decrease the overheads and hence increase the overall margin on bicycles.
- **Improper Segment** - Nearly 87% of the production of bicycles in Pakistan is of Standard bicycles, which worldwide is a dying segment. The standard bicycle segment has reached the end of its Product Life Cycle curve and needs to be phased out. The biggest OEM, Sohrab, does not feel confident in fancy bicycle segment, which worldwide is a reviving bicycle segment. Similarly, they have no presence in folding bicycles, electric bicycles or lightweight Aluminium alloy bicycles. They need to concentrate on bringing out new models fast.

7.2.6 Financial Bottlenecks:

- **Credit by small players** - The small OEMs have to sell their bicycles on credit. Thus, their money gets blocked and they have limited room for expansion. Sohrab is the only OEM that sells its bicycles on cash and hence has money to expand and do research and development.

7.2.7 Potential Threats:

- **WTO** - According to WTO rules and regulation, the trade barriers, which include customs duty, will have to be lowered. Even with a 25% customs duty tariff, an Indian bicycle, if legally imported, costs Rs1900 and can be sold in the Pakistani market (although Indian bicycles are on the banned item list). If Indian bicycle imports are allowed and trade barriers lowered, then a foreign bicycle will become cheaper to import and the share of local bicycle manufacturers will decline. Even now, smuggled Chinese bicycles have a roughly 40% share of the Pakistani bicycle market and Taiwanese fancy bicycles are being legally imported into Pakistan, which indicates their popularity.
- **Smuggling** - One of the biggest complaints that the OEMs had was smuggling of bicycles through Afghan Transit Trade (ATT). These bicycles are meant for Afghanistan and come in containers. These containers are opened before crossing Pakistan's border in NWFP and then supplied all over Pakistan. According to the customs bureau in Peshawar, in a 10-month period of 1998-1999, some 360,000 bicycles passed through ATT. We feel that all these bicycles came into Pakistan and are threatening our local industry.
- **Cottage Industry** - Bicycle manufacturing does not require extensive technical know how, heavy machinery or a big plant. There are some small players who are actually manufacturing bicycles on a small scale. The advantage of manufacturing on a small scale is that the OEM does not have to pay the right amount of sales tax. They can cheat on their production figures and hence pay sales tax less than the required amount. This results in them having a lower final price than the big OEMs. The low price makes their bicycle more attractive to the buyer.

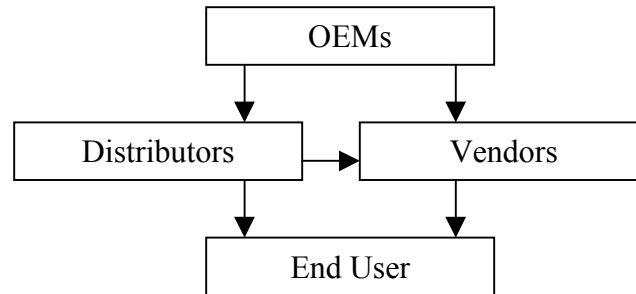
Dealer's/Retailer's Value Chain:**Figure 32: Dealer's/Retailer's Value Chain**

The vendors pay the money in advance to Sohrab. The credit period is usually a month. As for the other OEMs, they either supply their bicycles on confirmed order or in case of Falcon, even on credit. Sohrab also has an advantage in terms of its corporate structure as some of these vendors are also members of PCICS cooperative society.

Lahore dealers have a dealer association from which many dealer members are also PCICS members. They decide upon the price at which bicycles are to be sold and the price structure is agreed amongst its members for retail.

Another option for small retailers, who want to buy bicycles on urgent basis, is to buy them from the big distributors, who in turn buy these bicycles directly from OEMs. The OEMs give these distributors no discount, but these distributors charge a mark up when then sell to a retailer.

The selling price of a bicycle in Lahore was more than the price that was being charged in Karachi and Peshawar, even though the dealers outside of Lahore have to pay the transport and other charges for delivery. In Peshawar, the price of Pakistani bicycle start from Rs.2550 at retail as compared to a Chinese bicycle, which retails for Rs.2900 at Hayatabad.



7.2.8 Regulatory Bottleneck:

- **General Sales Tax -**

7.2.9 Institutional Bottlenecks :

7.2.10 Technology Bottlenecks :

- **Lack of Initiative** - Most of the vendors do not have an idea about the true needs of a customer because they are not aware of the advancements taking place all over the world. They do not pressurize the OEMs to change model and are happy with the status quo. They do not offer any advice to the OEMs regarding their models popularity and lack initiative to force OEMs to change models.

7.2.11 Productivity/Skill/Managerial Bottlenecks:

- **Lack of Scientific Instruments** - Most of the vendors assemble bicycle by hammering them. They do not have any precision scientific instruments like a wrench to precisely tighten the screw or nut. They do it without the help of any instrument and thus lack uniformity in their processes. At times, they end up denting the bicycle.

7.2.12 Marketing Related Bottlenecks:

- **Most Illiterate** - Most of the vendors are illiterate and do not know how to do public dealing properly. Similarly, they do not market their shop. Most of the vendors are operating on word of mouth promotion basis or from previous sales. It is difficult for a new customer to judge which shop to go to. A new customer has to go to 3-4 shops before they decide which model and brand to buy.

- **Lack of Credibility** - Customer's perception about Nila Gumbad vendors is that they exist a mafia in the shape of their dealer's association which fixes price and does not let vendors operate a healthy competition. The customers perceive that the Nila Gumbad Dealers Association is a potential hurdle in bringing about change. There exists a collusion of vendors and this does not benefit the customers. Similarly, customers perceive that they are robbed as they feel OEM supplied parts are replaced by the vendor and are instead replaced by low quality parts.

7.2.13 Financial Bottlenecks:

- **Advance Credit** - Most of the vendors have to give at least 1-month credit to Sohrab. Sohrab is the only OEM, which is working on cash. They take credit from other OEMs and vendors, including tire and tube manufacturers, but pay Sohrab in advance. This ties up their money.
- **Huge Inventory** - Even the smallest of bicycle vendors carry at least 3-4 different OEMs bicycles and 8-10 different models of bicycles, not counting the parts. They carry at least an inventory of Rs50,000 at any given time. In order to recoup their investment, the need to have a high profit margin on their investment.

7.2.14 Potential Threats:

- **Child Labor** - Although child labor is not a serious issue at the retailer stage but some retailers do employ children to work for them, as they demand less pay.

7.3 SWOT Analysis of the Pakistani Market:

SWOT analysis of the Pakistani market has been done based upon Sohrab only, as Sohrab is the only player who we feel has the potential to exports. This potential is based upon our knowledge of their production facilities, their knowledge about the local as well as foreign markets, the capability of their management, their presence in the local market and their willingness to export.

<p><u>Strengths</u></p> <ul style="list-style-type: none"> • Product Segregation • Large Experience of Bicycle Manufacturing • Biggest Player in Pakistan • Technologically Sound • Financially sound • Self reliant 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> • Co-operative Society, hence large number of decision makers • Not much experience of exports • Slow, pro-active and complacent approach • High cost of raw material • Low vendorisation • Imported bicycle parts, especially in MTBs • Low volume of MTBs
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> • Can move into MTBs • Can move into Wheelchairs and exercisers • JVs with foreign firms • Export markets of Africa for standard bicycle and EU and USA for fancy bicycles. 	<p><u>Threats</u></p> <ul style="list-style-type: none"> • Bicycle smuggling through ATT • WTO agreement • Imported High Value MTBs • Neighboring countries

7.4 Cost Competitiveness Comparison Bicycle Industry:

Retail Price Breakdown of 24" Roadster

							w tyre tube	
	Pakistani Pak Rs.	% agg	Indian Indian Rs.	% agg	Indian Pak Rs.	% agg	Pakistani Pak Rs.	Difference in Pak Rs.
Variable cost	1,200		798		958		1,520	562
Fixed cost	400		200		240		400	160
Cost of manufacturer	1,600		998		1,198		1,920	722
Profit	80	5%	30	3%	36	3%	80	44
Mfr's selling price w/o sales tax	1,680	15%	1,028	6%	1,234	6%	2,000	766
Mfr's selling price w sales tax	1,932		1,090		1,308		2,300	992
Cost of parts added	505		135		162		185	23
Labour costs	50		20		24		50	26
Cost to dealer	2,487		1,245		1,494		2,535	1,041
Profit	213	9%	55	4%	66	4%	165	99
Retail selling price	2,700		1,300		1,560		2,700	1,140

Table 14: Price Structure of Pakistani Bicycle vs. Indian Bicycle

The Indian bicycle prices are estimated figures, which were provided to us during a telephonic conversation with Hero Bicycles marketing person in India. He informed us that the retail-selling price of a standard bicycle in India varies from Indian Rs.1200 to 1300 and that the manufacturer's selling price is roughly Indian Rs.1030. He also mentioned that Hero group earns a maximum of Indian Rs.30 per standard bicycle as profit. The sales tax in Ludhiana, India is 6% and varies state to state from 6% to 11%. Using these figures, the rest of the figures have been estimated by backward calculation. The Pakistani prices are also rough figures and do not represent the price of any one company in particular.

The difference between manufacturing cost of an Indian bicycle and Pakistani bicycle is approximately Rs.600. After adding on the sales tax and the manufacturer's profit, this difference shoots up to Rs.1000. At the retailer stage, the difference in price between

Indian bicycle in India and Pakistani standard bicycle in Pakistan becomes Pakistan Rs.1200.

In India, the manufacturers supply bicycles with tire and tube to the retailer, as these are very cheap in India. A set of tire and tube costs roughly Indian Rs.70 (Pak. Rs.85) in India, while in Pakistan a good tire costs Rs.120 onwards and a good tube Rs.40 at retail, a total of Rs160.

In Pakistan, the retailer offers a variety of tires and tubes to the customer and allows him to pick and choose, which invariably gives the seller the option of substituting a quality tire with a cheaper or a smuggled product.

At the retailer stage, the following parts are added:

Component	Rs.
2 Tires	240
2 Tubes	80
Carrier	80
Lock	30
Paddle cover & bell	25
Assembly/Fitting of bicycle	50
Total	505

Table 15: Cost of Parts added by a Retailer on Bicycle

7.5 Problems being faced by the Bicycle Sector:

During discussions with the manufacturers, the following problems were pointed out which lead to the high cost of bicycle in Pakistan.

7.5.1 Constraints in Raw Material Imports:

The raw material that is used in the bicycle industry is Cold Rolled Steel Sheets (CR4). Pakistan Steel Mills (PSM) do not produce this steel sheet so companies have to buy commercially imported steel sheet either from the local market or they import it directly themselves with concessional permission from CBR. Small players like Eagle and PECO do not import it but buy it directly from the local market in quantities of few metric tons. PCICS imports it and pays concessional duty of 5% on them. According to PCICS, they are allowed to import their allowed raw material at 5% duty.

The requirement for raw material is based upon their production levels, which are assessed annually by the Provincial and Federal Industries Department and intimated to CBR who permit raw material imports on concessional rates.

Steel sheets import is not allowed from India where the raw material (CR4) sheets are 50% cheaper. PCICS are buying steel sheets from Hungary and the local market is flooded with CR4 sheets imported from Brazil and South Africa.

7.5.2 Constraints in PSM Supplied Sheets:

The biggest complaint with PSM supplied sheets was that the sheets were not uniform in thickness. A 0.8mm gauge thick sheet could vary as much as ± 0.2 mm or more. This results in a lot of wastage as well as broken dies and rejection. Nearly all the bicycle manufacturers buy local pipe material from IIL, which itself buys the sheets from PSM and roll them to make uniform thickness. They are facing the problem of irregular supply from PSM. This results in their supplying steel sheets to the bicycle manufacturers at an irregular supply rate.

According to the OEMs, the PSM supplied sheet has a big rejection rate of approximately 20% in manufacturing of parts, because of a number of reasons. This includes waviness in steel sheet, different than required chemical composition, variation in thickness of the sheet and the thickness exceeding tolerance limits for a particular grade of sheet.

Effect of Costly Inputs (in Pak Rs.)				
Weight of Pakistani Bicycle	24 kg			
Weight of Indian Bicycle	21 kg			
Difference in Weight	3 kg			
Price of Steel	31 /kg			
Difference in Rs.	93			
Steel				
Amount of Steel used	24 kg	Imported Mtrl (kg)		8
International Price	23 /kg	Local Mtrl (kg)		16
Pakistani Price	31 /kg			
Customs Duty (raw mtrl)	5%			
Other Charges	8% (bank charges, insurance, transport)			
Difference in Imported Mtrl	24	Diff. In Local Mtrl		128
Difference in Rs.	152			
Steel Rejection Rate				
PSM	20%			
India	5%			
Steel Purchase from PSM	30 kg			
Steel Purchase from India	25 kg			
Difference in Rs.	147			
Labor Productivity				
Indian Labor Productivity	20% more			
Labor Cost in Pakistan	137			
Labor Cost in India	114			
Difference in Rs.	23			
Electricity				
Unit Charges in Pakistan	4.5 /unit			
Unit Charges in India	3.25 /unit			
Units Consumed per Year	2643403	1997 units of Sohrah		
Production	320291 (1997)			
Difference in Rs.	10			
Sales Tax on Bicycle and Spares				
Sales Tax in Pakistan	16%			
Sales Tax in India-Ludhiana	6.0%			
	Cycle	Tire	Tube	Spares
After Sales Tax in Pakistan, Rs.	1944	74	31	115
Sales Tax in Pakistan, Rs.	268	10	4	16
After Sales Tax in India, Rs.	1222	40	30	96
Sales Tax in India, Rs.	69	2	2	5
Difference, Rs.	199	8	3	10
Total Difference in Rs.	220			
Gross Effect	645	12 US\$		@54 Pak Rs.

Table 16: Effect of Costly Inputs

In meeting with different vendors and OEMs, the above-mentioned points were repeatedly said which influence the price of bicycle and lead to a higher export price than our competitors. Of the above mentioned Rs607 difference, Rs363 pertain directly to

export market as when exporting, a company does not have to pay sales tax and the custom duty paid on imported raw material gets refunded.

Another problem mentioned was the high sales tax on a mode of transport, being used by a low salaried person. The sales tax being charged in Pakistan is 15% while that in India varies from state to state and is between 3.5% to 11%. This problem was stressed upon by PCICS, as it is difficult for them to evade sales tax because they are importing raw material for which proper documentation is required. The small players or the cottage industry players have an advantage because they are working without proper documentation and it is difficult for Central Board of Revenue to judge their production.

Other Hindering Factors:

The development of the bicycle industry is threatened by a number of factors:

- Raw material being supplied to the bicycle industry from PSM and raw material dealers, is 50% higher than international prices.
- Smuggling of Chinese bicycles through Afghan Transit Trade (ATT) and the Chinese export rebate of 17%.
- No development of cycle paths.
- Buses wagons and cars, not giving right of way to bicyclists.
- No government interaction to promote bicycle usage.

The problem in having a standardized bicycle is that the small players will have to invest heavily in order to match the automation level of Sohrab, is a limiting factor for new players in the field of bicycles. But as we see from Hero, some of the players with a full knowledge of market, with better attachments to the fancy bicycle are entering the market in a big way.

Chapter 8. Recommendations

We are suggesting a three pronged strategy for the bicycle sector. Two of these strategies relate directly to bicycles while the third one relates to the external variables which are not only related to the bicycle sector but can be applied to the overall light engineering sector.

8.1 Standard Bicycle:

We feel that the standard bicycle has more potential inside Pakistan than in exports. For this we recommend:

- **Decrease in Production Costs:**

The production costs of manufacturing a bicycle needs to be decreased. The overheads involved in manufacturing a bicycle needs to be cut down drastically as they are roughly 40% of the cost of a bicycle. The fixed costs involve:

1. Labor costs, which will decrease as production increases.
2. Electricity and other utilities charges which will decrease as production increases.
3. Administrative expenses
4. Manufacturing overheads

- **Make Aesthetically Pleasant:**

The standard bicycle needs to be changed and made more aesthetically pleasant. This calls from an out of tradition thinking and a radical approach. This approach has been seen in Pakistan's Hero Sports Division bicycles who have made their saddle of injection molded rubber, instead of the traditional spring seat with rexine cover. They also came up with multi colored standard bicycle that is a step ahead of the normal single color standard bicycles, which are mostly in black, green or red.

Similarly, the standard bicycle's design needs to be looked at. Most of the standard bicycles manufactured in Pakistan are of double bar, which weighs more and costs more than a single bar bicycle but there exists no need to make it a double bar. There is a perception in customer's mind that a double bar bicycle is stronger than a single bar

bicycle and hence they prefer buying a double bar bicycle. Concepts like these need to be addressed and changed.

Similarly, a colored bicycle tube is the standard for Pakistani bicycles. A black tube costs less and has more Carbon black in it, which makes it more durable than a colored one. A customer buys the tube because of its color. The reason is that nobody has informed the customer that a black tube is more durable than a colored one.

- **Uniformity in Quality:**

There exists virtually no uniformity in quality of an OEMs bicycle. Although the quality of Sohrab brand bicycles is uniform but the rest of the industry suffers with this problem. The advantage Sohrab has over other manufacturers is that they have more modern machinery and are applying for ISO9000 certification for their bicycle plant. For this they have set procedures and processes which other manufacturers have not.

- **Product Guarantee:**

Only Sohrab and Hero bicycles are giving 5-year guarantee on their bicycles. Hero has been established for nearly a year so customers are not sure whether the company will be there for 5 years to fulfill any guarantee Sohrab's guarantee is time factor based. Sohrab's charges nothing if the bicycle component fails 6 month after the bicycle has been bought. With the passage of time, the customer has to pay some amount for the part.

- **Bicycle Operator Manual:**

As yet none of the OEMs have published a bicycle operator manual which tells the customer how to look after the bicycle. None of the OEMs have addressed this need of the customer. The customer needs to be informed about greasing, oil replenishment and tire and tube maintenance.

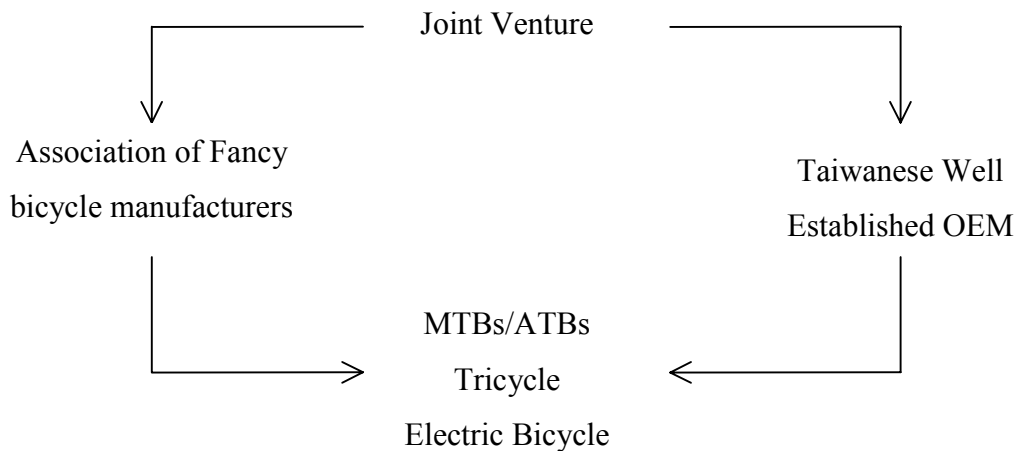
- **Affiliation:**

OEMs need to make affiliations with tire and tube manufacturers. The customer should not be given the option of choosing a tire or tube at the retailer stage. This leads to a lot

of confusion for the customer who feels that he has been cheated if the tire or tube gets worn out before a certain time frame set in his mind.

8.2 **Fancy Bicycles:**

We are proposing a joint venture between an association of fancy bicycle manufacturers and a big Taiwanese bicycle company like Giant or Merida company of Taiwan, who already have a well established brand and presence world wide. The primary advantage this foreign company will be having is of cheap labor. We are further proposing the following setup:



We are looking at an initial production figure of 10,000 fancy bicycles per month, which can be expanded to 20,000 in 2-3 year's time. At the rate of US\$60 per bicycle and at an export ratio of 80%, we are looking at an export potential of nearly US\$6 million for the first year.

The association of fancy bicycle manufacturers will consist of bicycle vendors and OEMs. It will work on a co-operative society basis, in which stakeholders get profit according to their investment.

The foreign partner will establish the supply side of bicycle components within the local industry, thus boosting the technological know-how of the local industry. The finished product will be the property of the foreign company, which will supply these bicycles worldwide, through their distribution channel.

Incentives for the Foreign Company:

Pakistan Steel Mills is not manufacturing Aluminium and Magnesium Alloys so these will have to be imported. In order to attract a foreign investor, these can be allowed to be imported duty free.

We estimate that the initial investment required for a plant of such capacity will not be more than US\$5 million. Against this investment, the JV will get a 100% Investment Tax Credit against machinery.

8.3 External Variables:

The third prong of the strategy is concerned with external variables. These include:

8.3.1 Availability of Raw Material at International Prices:

The raw material used in the manufacture of bicycle is Cold Rolled Steel Sheet (CR4) and Hot Rolled Steel Sheet (HR4). PSM does not manufacture CR4, therefore the manufacturers have to either import it or buy it from the local market at a high rate. PSM does not make CR4 or even CR3 sheets.

The raw material supplied by PSM has a quality problem with all the bicycle manufacturers complaining about steel sheet waviness and non-conformity of thickness. The material supplied by them is out of tolerances and varies in thickness. Nearly all manufacturers buy their pipe raw material from IIL (International Industries Limited) which is the largest supplier of small diameter pipes in Pakistan. IIL itself buys from PSM or local market, then re-rolls the sheets to bring them to specified tolerances and thickness and then makes pipes out of the sheets. Similarly, the varying thickness of steel sheet can lead to fracture of dies and other equipment used for deep drawing of bicycle part, which leads to rejection rate increase.

For Rim, a special grade of Cold Rolled steel sheet, SPCC-4B, is used which although listed in PSM price list but is not actually produced by PSM.

The prices of steel sheets are roughly 50% higher in Pakistan than that in India, while probably offering less rejection rate. According to the OEMs, a bicycle weighs in the region of 21-23 kg while material used per bicycle is approximately 28-30 kg. Most of the scrap is sold at a much-reduced rate.

Another complaint by the OEMs is that they are not allowed to supply imported raw material to their vendors. The vendors have to purchase from local market and hence the rejection rate is high leading them to pass overheads generated due to rejected parts being passed on as price increase to OEMs, which means supplying expensive parts to OEMs. The vendors cannot directly import steel sheets because of small volume. This statement has been checked from the CBR and found to be of fake premises.

8.3.2 Start of a Bicycle Leasing Scheme:

There exists a need for country wise bicycle leasing scheme that guarantees OEMs a fixed quantity of bicycle. These bicycles will be bought by the government and distributed through a leasing company. The advantage of this for the OEMs will be that they will be having confirmed orders. The bicycles will be distributed to customers after receiving a payment from them in advance. The payment will be a down payment with the rest of the money coming in easy installments. The OEMs in turn will lower their bicycle prices by reducing their margins, increasing their production and hence lower their overheads and reducing the margins of retailers/dealers.

The advantage of this for the customers will be the cost benefit of owning a new bicycle and payments in easy installments.

Cash Scheme vs. Loan Scheme:

We are proposing a price drop in Pakistani bicycles in order to widen the price difference between the local made bicycles and the Chinese make bicycles. We think this will discourage people from buying Chinese bicycles that are available in the market which come with accessories like Dynamo, Light and have better aesthetics than Pakistan made bicycles.

In Peshawar, a Chinese bicycle costs Rs.3000 while a Pakistani bicycle costs Rs.2600 onwards. Probably this is the reason why Chinese bicycles are outselling Pakistani bicycles 100 to 1 (conservative estimate) in NWFP. The Rs400 difference in price means customers prefer Chinese bicycles because it comes with accessories that compensate for the higher price.

By increasing the current price difference between Pakistani and Chinese bicycles and by selling Pakistani bicycles on easy installments, the Pakistani bicycle market can increase drastically. In 1998-99, according to Afghan Transit Trade, it is estimated that some 430,000 bicycles were smuggled into Pakistan. The sales of Chinese bicycles should drop down to a trickle because of they price difference and easy installment plan and their market share in new sales should reduce down from 1997-1998's figure of 50% to less than 5%.

In order to sell bicycles on installments, an organization/leasing company has to be established. It may be on the lines of a finance co-operative society. The society can adopt 3 plans for companies:

- The installment plan is meant for companies who will pay the total cost of the bicycle and then deduct the installments from their employee's payroll.
- Another option is that companies will undertake to make the installments on behalf of their employee. In this option, they will not make an outright full payment, but leasing companies could initially pay money.
- For individuals wanting to buy the reduced price bicycle, they can either make the full payment in cash or in order to pay on installments, get attested guarantees from 2 individuals who will be held responsible in case of any default.

If a bicycle scheme is started where bicycle manufacturers are guaranteed sales of one million units per annum, then the increase earning in the shape of Sales Tax for the government would be:

	Production, units	Price, Rs.	Sales Tax, Rs.	Sales Tax Earning, Rs.
Current	656,000	1,944	268	175,808,000
Estimated	1,000,000	1,365	218	218,000,000
Increase in Earning				42,192,000

Table 17: Sales Tax Earning on Bicycles

Thus by reducing the bicycle price and choking off the smuggled Chinese bicycle trade, government can earn roughly Rs42 million per annum more for the increased production. The increased production will also create a further direct employment of 2000 people, with companies going for double shift in order to meet the increase in production of 325,000 units.

Price Elasticity:

By surveying some households for new bicycle demand in a working class neighborhood in Lahore, we were able to come up with the following data

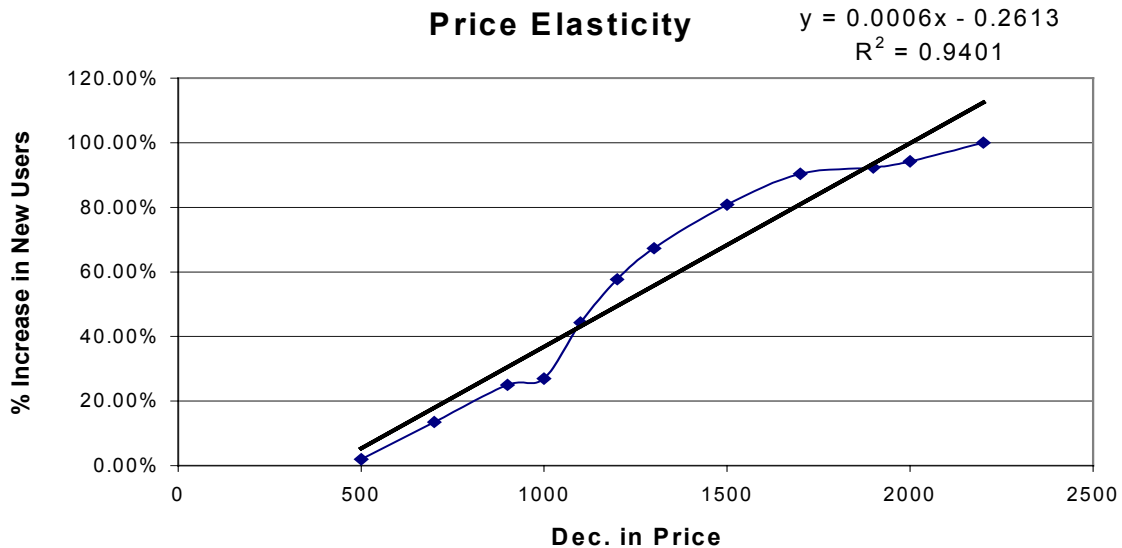


Figure 33: Price Elasticity of Bicycle

This data led to the following trend equation:

$$\% \text{ Increase in New User} = 0.0006 * \text{Decrease in Price} - 0.2613$$

The slope of this equation shows a positive tendency. This indicates if the price is decreased, then the new user base will definitely increase and vice versa.

Using the above Price Elasticity trend equation will lead to the expected increase in demand figures, shown in figure 44. The retail-selling price of a bicycle used to formulate the price elasticity trend equation is Rs.2700.

Expected Increase in Demand:

Total Labour Force		38,000,000
Total Demand	25%	9,500,000
Total Cycles in the Market		4,800,000
Unmet Demand		4,700,000
Slope		0.0006
Dec. in price	% inc. in mkt.	Inc. in demand
450	0.87%	40,890
500	3.87%	181,890
550	6.87%	322,890
600	9.87%	463,890
650	12.87%	604,890
700	15.87%	745,890
750	18.87%	886,890
800	21.87%	1,027,890
850	24.87%	1,168,890
900	27.87%	1,309,890
950	30.87%	1,450,890
1000	33.87%	1,591,890

Source: SMEDA Market Research

Figure 34: Expected Increase in Bicycle Demand at Different Prices

The above data indicates that by reducing the price by Rs.650, i.e., bring the price down from Rs.2700 to Rs.2050 will result in an increase demand of roughly 605,000 units or nearly double the current volume being produced by Pakistani manufacturers.

According to Economic Survey of Pakistan, the estimated labor force for the year 1998-99 will be approximately 39 million. Out of this labor force, an estimated 25% will require bicycles. The 25% has been taken as an arbitrary figure. This works out to be an estimated 9.8 million. According to SMEDA's market research, there are approximately 7.7 million cycles in Pakistan. This leaves an estimated unmet cumulative demand of 2.1 million bicycles.

From the previous 31-year figures of labor force, the estimated increase in labor force is on an average 2.5% amounting to roughly 1 million people annually. At the 25% estimated bicycle demand, the increase in new bicycle demand will be roughly 0.25 million. This will mean an existing pending cumulative demand of 2.33 million bicycles.

The Effect of Bicycle Scheme:

On Manufacturers:

The manufacturers will run their assembly units at the maximum output. This will lead to their reducing overheads and employing workers to meet the demand. They will get the money up front, which will then be retained by them or given to their vendors for manufacturing of vendorised parts.

On Vendors:

Now days the bicycle part vendors provide credit of 30-45 days to the OEMs. The vendors in turn borrow either from banks or from other people. According to one of the manufacturers, 90% or more of these vendors borrow from other people.

If the vendors are paid their money in advance, they will be able to reduce the cost of parts supplied to the OEMs. The OEMs will have to become more cost conscious in order to achieve same revenue as before. This will lead to their becoming competitive in international markets.

On Retailers:

The retailers will be pushed to reduce their profit margins. They will be able to sell more than before, because of the reduced price, in effect keeping their revenue constant. The retailers will be pushed to sell Pakistani make bicycle in order to keep their revenue constant.

Eventually, these foreign smuggled bicycles may no longer be feasible for smuggling, thus leading to a lessening in the smuggling activity of bicycles.

8.3.3 Technological Improvements by Decrease in Wastage:

In Paints:

Other than Sohrab, who have a fully automatic conveyor driven electrostatic painting plant, all the manufacturers are painting bicycle with a manual spray gun. This increases the wastage in spray paints by 30%-40% (a rough estimate). A locally manufactured furnace and spray gun paint system costs roughly Rs300000, of which Rs150000 will be

for the gun and Rs150000 for the transformer running it. It will be sufficient for roughly 5000 bicycles per month. A fully automatic conveyor driven plant will cost roughly Rs.1 million. An electrostatic painting plant can cut down the wastage level to 5% or less for paint.

In Electroplating:

The electroplating process, which constitutes roughly 13% of the total manufacturing cost of a bicycle, is dependent upon uninterrupted power supply. Sohrab and PECO have fully automatic electroplating units while Eagle has a manual operated electroplating unit. Sohrab has uninterrupted power source whereas Eagle and PECO do not have a standby generator. When the items are being electroplated, an interruption in the power supply causes the automatic machine to restart and hence the process has to be done all over again. This results in increased cost, which is then passed onto the customer. The power required for one plant for 500 bicycles per day is approximately 100,000 W i.e. 0.1 megawatts.

Indian bicycle manufacturers use horizontal plating plants whereas in Pakistan, the bicycle manufacturers use vertical plating plants. The advantage of horizontal plating is that the capacity increases. Roughly, Indians put 45 rims in a tank, while Pakistani manufacturers put 20 rims in an electroplating plant of a similar size tank. A plant similar to Sohrab's existing medium sized plants, PLC controlled and fully automatic horizontal plating plant, costs roughly Rs.10 million.

In Heat Treatment:

Sohrab had an Italian fully automatic electrically powered heat treatment plant installed in their factory, which has been shut down. The reason for the closure is the plant requires a big load every time it is run. With dwindling production, the plant is not being used. They are looking for buyers for the plant.

For now they use furnaces filled with heat treatment salt, which is a primitive way of heat treatment and without availability of metallo-graphic analysis cannot deliver results.

8.3.4 Increase Vendorisation:

In India, frame, front fork and rims are the only components that are manufactured by OEMs. In Pakistan, PCICS manufacture their own crank and chain wheel set, rims, hubs, axle, free wheel, frame, brakes, front fork and mudguard, i.e. nearly everything, other than saddle and chain. The only difference between PCICS, PECO and Eagle is that they buy free wheel whereas PCICS manufactures its own.

Vendorisation can lead to lower cost, as the vendor will be specialized in only one item. The vendor can then supply that item to different OEMs who will assure the purchase of its item. The vendor can also supply the item to the retailer and export it.

The advantage of this for the OEM will be the quality aspect for that item as the quality can be checked at the vendor stage. There will be less amount of wastage involved for the OEM and substantial cost saving.

When asked about vendorisation from the current OEMs, PCICS complained about the lack of good quality and standard vendors when their company was formed initially. With the passage of time, as the industry grew the companies enhanced their own capabilities rather than relying on vendors as PCICS were not getting quality items. This resulted in a dearth of vendor industry for majority of the components. A small vendor industry is already established, but till now PCICS, PECO etc. prefer to make in house.

8.3.5 Legislative Improvements:

Taxation:

The vendors when supplying the manufactured part to the OEM have to pay a sales tax of 15%, when the OEM sells the bicycle, they have to pay sales tax of 16% as some of their vendors are not Sales Tax registered. This results in double taxation and hence the cost of the final product increases.

Stoppage in Smuggling:

A lot of bicycle components are smuggled through Iranian border. This needs to be stopped as this trend is hurting the local industry especially the tire and tube industry.

According to a rough estimate, more than a 1 million tires are smuggled annually through this border.

Stoppage through Afghan Transit Trade:

In 1997-1998, some 673,000 bicycles and in 1998-1999 roughly 430,000 bicycles were smuggled into Pakistan. We feel that all these bicycles were smuggled into Pakistan, if not 100% then at least 80%, as Afghanistan market for bicycles is very small compared to that of Pakistan. All these bicycle containers are being opened within the Pakistani jurisdiction. There are big dealers of these bicycles who then distribute these bicycles by the container load within NWFP and other provinces.

8.3.6 Regulatory Environment:

Role of Government Agencies:

Currently there are some 28 agencies to which the bicycle manufacturers have to deal with. These include:

Social Security, EOBI, Labor Department, Civil Defence, Municipal Committee, City Development Agency, Withholding tax, Income Tax, Sales Tax, Wealth Tax, Wapda, Sui Gas, Railways/PIA, PTCL, CBR-Customs, CBR-Export Rebate, SBP, PSIC/SIE, District Administration, Provincial/Federal Ministry of Industry, EPB, Federal Bureau of Statistics, Provincial Bureau of Statistics, Ministry of Science & Technology, Board of Investment.

The role of some of these agencies needs to be merged. This in effect will lessen the hassle being faced by the vendors and OEMs e.g. the role of CBR Customs and Export Rebate can be merged. Similarly, Federal Bureau of Statistics and Provincial Bureau of Statistics role is the same.

Role of State Bank:

Revision in Pakistan Standards for Bicycle and bicycles components:

Harmonized System (HS) codes are used to describe a product. This is a universal system, which is used mostly by Custom Bureau all over the world to identify the product so that the import and export figures can be obtained. A previous standard adopted was SITC (Standardized Industrial Trade Classification) codes.

HS Code	Description
8712	Bicycles and Other Cycles, Not motorised
871491	Frames and Forks, and parts thereof
871492	Wheel rims and spokes
871493	Hubs, Other than coaster braking hubs and hub brakes, and free wheel sprocket wheels
871494	Brakes, including coaster braking hubs and hub brakes, and parts thereof
871495	Other saddles
871496	Pedals and crank gear and parts thereof
871499	Other parts and accessories (exc 871491 to 971496)
401150100/900	Bicycle tyres and tubes
401320	Inner tubes for bicycle tyres

Table 18: HS Codes related to Bicycle

ISO Standards	Description
4210	Cycle; safety requirements of bicycles
6692	Cycles; marking of cycle components
6693	Cycles; cotter pin and assembly of the axle/cotter pin/crank
6695	Cycles; pedal axle and crank assembly with square end fitting; assembly dimensions
6696	Cycles; screw thread used in Bottom Bracket assemblies
6697	Cycles - hub and free wheels - assembly dimensions
6698	Cycles; screw thread used to assemble freewheels on bicycle hubs
6699	Cycles; stem and handlebar bend; assembly dimensions
6701	Cycles; external dimensions of spoke nipples
6742-1	Cycles; lighting and retro-reflective devices; photometric and physical requirements; part 1; lighting equipment
6742-2	Cycles; lighting and retro-reflective devices; photometric and physical requirements; part II; retro-reflective devices
8090	Cycles; terminology
8098	Cycles; safety requirements for bicycle for young children
8098 AMD 1	Cycles; safety requirements or bicycles for young children; amendment 1
8488	Cycles; screw threads used to assemble head fittings on bicycle forks
8562	Cycles; stem wedge angle
9633	Cycle chains; characteristics and test methods
10230	Cycles; splined hub and sprocket; mating dimensions
11243	Cycles; luggage carriers for bicycles; concepts, classification and testing

Table 19: Bicycle related ISO Standards

PSI Code	Description
1841	Bicycle and its Parts; Cotter Pin
957	bicycle and its Parts; Crank and Chain Wheel
462	Bicycle and its Parts; Frame
1390	Bicycle and its Parts; Free Wheel
463	Bicycle and its Parts; Handle Bar
862	Bicycle and its Parts; Hub Assembly
1595	Bicycle and its Parts; Lighting & Reflecting Devices
1840	Bicycle and its Parts; Lighting & Retro-reflecting Devices
464	Bicycle and its Parts; Pedal Assembly
861	Bicycle and Its Parts; Rim
838	Bicycle and its Parts; Saddle Cycle Leather
1644	Bicycle and its Parts; Screw Threads used to assemble Free Wheel on Bicycle Hub
466	Bicycle and its Parts; Seat Pillar
465	Bicycle and its Parts; Spoke (inc. Nipples and Washers)
1559	Bicycle and its Parts; Steel Tubes
484	Bicycle and its Parts; Tubes
687	Bicycle and its Parts; Tires

Table 20: Pakistan Standards for Bicycle and Parts

Pakistan Standards (PSI) are a watered down version of JIS, ISO, BSI and DIN. Nearly all Pakistan Standards have been taken from Internationally recognized standards and modified to comply with the Pakistani conditions.

Most of these standards were established in 1980s with the latest being early 1990s. We feel that there is a need now to revise these standards as technologically things have advanced to a level where there exists a need for change in these standards.

Customs rules and regulation, including Export Rebate:

According to the CBR Notification S.R.O.175 (I)/99, the custom rebate on bicycle tires size about 70 cms * 3.75 cms is Rs.339.70 per 100 pieces while that on bicycles tubes size about 70 cms * 3.75 cms is Rs.349.03 per 100 pieces. Another CBR Notification S.R.O.174 (I)/99 specifies the custom rebate on Spare Parts of bicycle to be 4.60% of the F.O.B. value. According to the CBR Notification S.R.O.465 (I)/78, the custom rebate on bicycle is Rs.176 per set piece. This notification was issued in May 1978 and has not been modified since.

The export rebate on Pakistani bicycles is Rs176. This rebate applies to both standard as well as fancy bicycles. Other than the export rebate, customs duty on imported raw material is refunded and sales tax is not applicable. Export rebate in China is 17%, up from 9%, while in India the export rebate consists of refunding customs duty on raw material only. In percentage terms, the export rebate on Pakistani bicycles is 10.4%. This does not include the customs rebate on imported raw material.

The export rebate needs to be differentiated for standard and fancy bicycles as a simple fancy bicycle costs nearly 50% more than a standard bicycle.

Effort of EPB in Bicycle Trade Shows:

According to information from the *Biknet Website*, following is the list of trade shows that were held all over the world in the year 1999.

Event Name	Date	Location
Pa 2 hjul, Gothenburg	Jan. 28-31, 1999	Sweden
International Bicycle Trade Fair	Jan. 1999	Katowice, Poland
Rundt om Cyklen, Odense	Feb. 26-28, 1999	Denmark
Ride & Bike, Bremerhaven	Feb. 1999	Germany
Chicago Bicycle & Fitness Show	Feb. 1999	Istanbul, Turkey
Turku Bicycle Exhibition, Turku	Mar. 20-21, 1999	Finland
Bicycle/Motorcycle	Mar. 1999	Istanbul, Turkey
Taipei Int'l Cycle Show	April 9-12, 1999	Taiwan
Bike 99, Birmingham	April 9-11, 1999	U.K.
Moscow Int'l Motorcycle & Bike Show	April 22-25, 1999	Russia
Pan Am Int'l Bike Expo, Monterrey	May 26-28, 1999	Mexico
Motorcycle And Bicycles	Jun. 1999	Nizhny Novgorod, Russian Federation
Eurobike, Germany	Sept. 2-5, 1999	Germany
Bicycle Exhibition, Graz	Sept. 6-26, 1999	Austria
Inerbike, Las Vegas	Sept. 10-13, 1999	U.S.A.
Eicma Bici, Milan	Sept. 15-19, 1999	Italy
Interbike, Philadelphia	Oct. 24-26, 1999	U.S.A.
Bicycles, Vejle	Oct. 9-11, 1999	Denmark
Bicykl, Poznan	Oct. 21-24, 1999	Poland
Norsykkel, Sandvika	Oct. 1-3, 1999	Norway
Japan Int'l Cycle Show, Osaka	Nov. 5-7, 1999	Japan
A B A. Grand National	Nov. 1999	Oklahoma City, OK, United States

Table 21: Bicycle Trade Shows in 1999

The only way to penetrate the foreign markets is to make the brand name felt in these fairs. EPB should encourage the OEMs and ask them to make their presence in these shows. Similarly, EPB needs to organize shows of its own.

8.3.7 Infrastructure Improvement:

One of the biggest complaints that the OEMs, vendors and retailers had was that the customer perception about bicycle usage is poor and that the government is not helping in any way to improve that perception. With the new road construction all over Pakistan, government should make it compulsory to add on a bicycle lane as well. With increasing air pollution, there will come a stage where fuel powered vehicles will have to be banned or decreased. At that stage, there will be an acute shortage of bicycle lanes and facilities. European countries have already started addressing this and they plan to increase the usage of bicycles from its current level. For this the governments have intervened and started arrangements to increase the bicycle usage in these countries.

8.3.8 Marketing Support Programs:

Prospective Markets:

We have taken those countries as prospective markets where India and China are already selling as we feel that the product we are offering is similar to that of Indian and Chinese. We feel that by targeting these countries in the short term, we will be able to make headway and sell our bicycles.

African Market:

Morocco Imports:

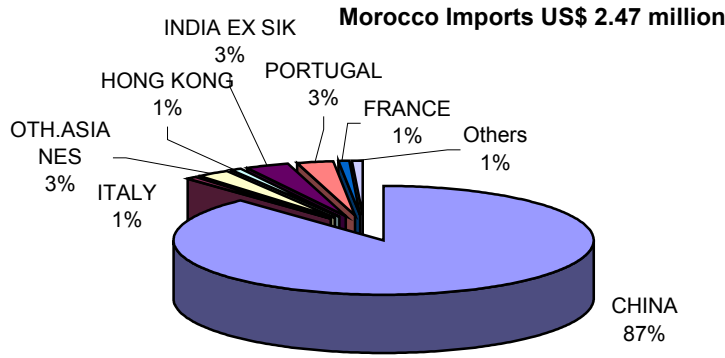


Figure 35: Prospective Market of Morocco 1997 Scenario

Morocco imported US\$2.47 million worth of bicycles in 1997 with the majority coming from China. India also featured in the imports to the Morocco. Nearly all the imports came from Asia.

Note: Other Asian States include imports from Taiwanese.

Kenya Imports:

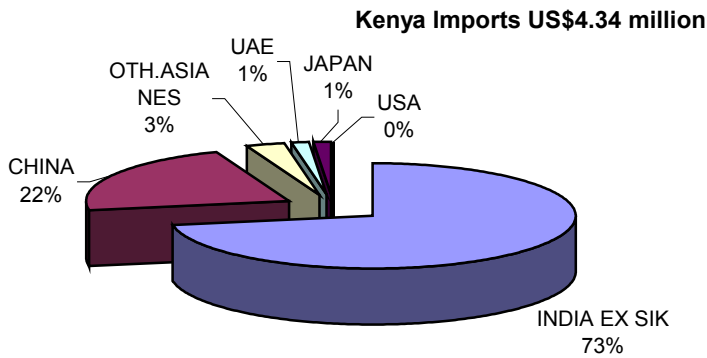


Figure 36: Prospective Market of Kenya 1997 Scenario

Kenya had a bicycle import market worth US\$4.34 million in 1997, which was nearly all fulfilled through imports from Asia. India supplied nearly two thirds of the imports while China supplied one fifth.

Egypt Imports:

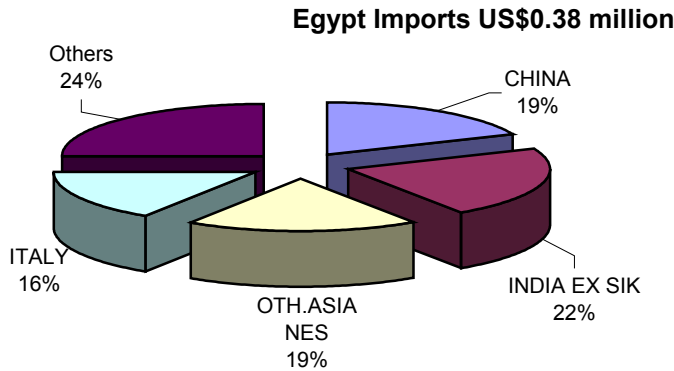


Figure 37: Prospective Market of Egypt 1997 Scenario

Egypt had a market worth US\$0.4 million, with nearly 60% of bicycles being supplied from Asia. China and India held major shares of the Egyptian bicycle import market.

South African Imports:

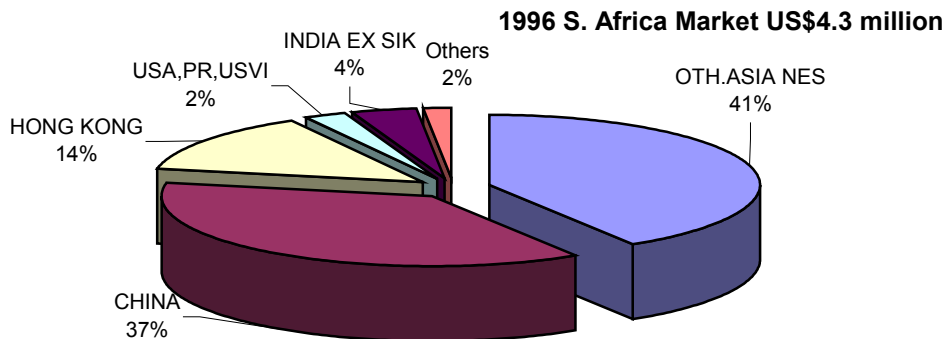


Figure 38: Prospective Market of South Africa 1996 Scenario

China controlled 37% of the South African market in 1996. India accounted for 4%, while Hong Kong accounted for 14%. Overall, Asian countries accounted for more than 95% of the total market.

Algeria Imports:

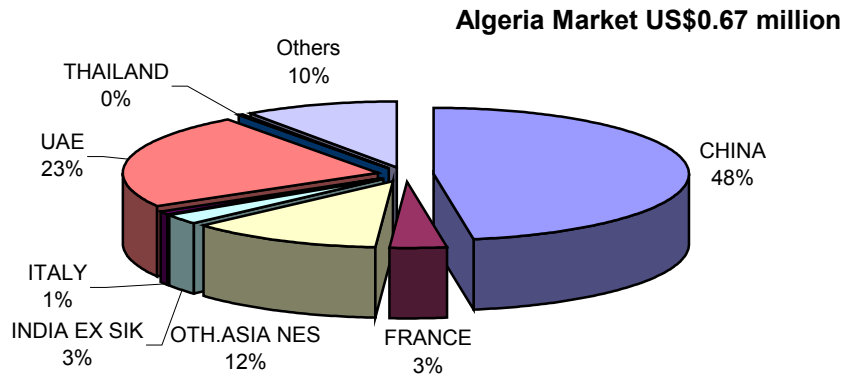


Figure 39: Prospective Market of Algeria - 1997 Scenario

China had a 48% share in the Algerian bicycle market while India had 3%. Overall, Asian countries supplied more than 60% of the market.

Mauritius Imports:

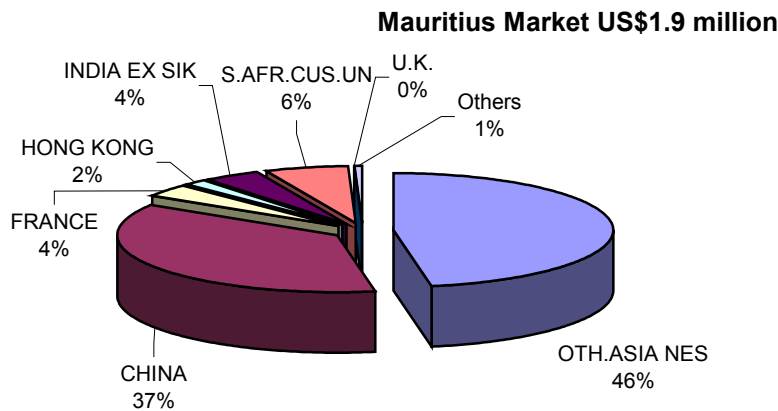


Figure 40: Prospective Market of Mauritius - 1997 Scenario

China accounted for 37% of the Mauritius market with India accounting for another 4% and Hong Kong 2%. Overall, Asian countries accounted for roughly 90% of the total market. Probably, the biggest share amongst the *Other Asian Nations* was that of Taiwan.

Zimbabwe Imports:

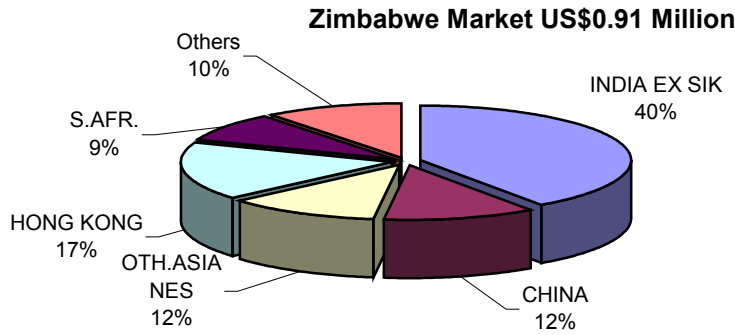


Figure 41: Prospective Market of Zimbabwe - 1997 Scenario

India held the major share of the Zimbabwe market at 40%. China accounted for 12% and Hong Kong accounted for another 17%. Overall the Asian countries supplied more than 85% of the total Zimbabwean bicycle market.

Madagascar Imports:

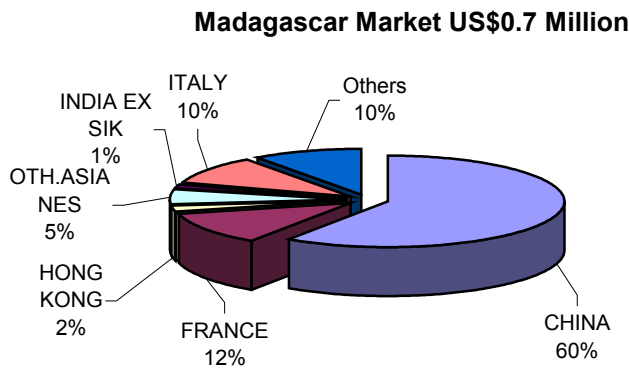


Figure 42: Prospective Market of Madagascar - 1997 Scenario

China held a 60% share of the Madagascar market in 1997. India and Hong Kong were also small time exporters to Madagascar. Overall, the share of Asian countries was roughly 70%.

Tunisia Imports:

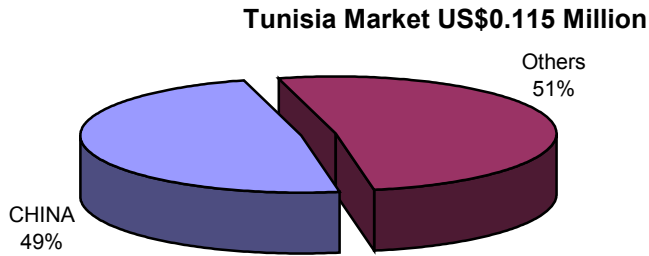


Figure 43: Prospective Market of Tunisia - 1997 Scenario

China held a 49% share of the Tunisian bicycle market in 1997.

Malta Imports:

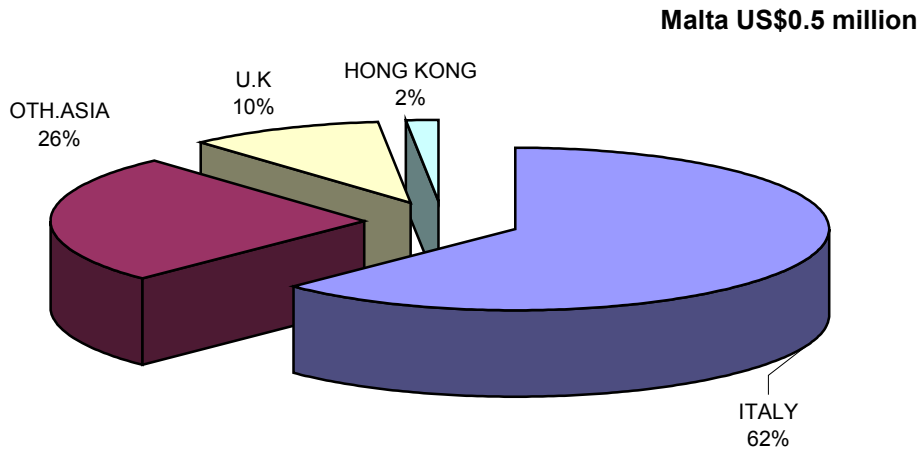


Figure 44: Prospective Market of Malta - 1997 Scenario

Malta has an import market of US\$0.5 million, most of this coming from Italy. 30% of the imports are coming from Asia but because of being a European country, most of the imports are coming from Europe.

Eastern Europe:

Latvia Imports:

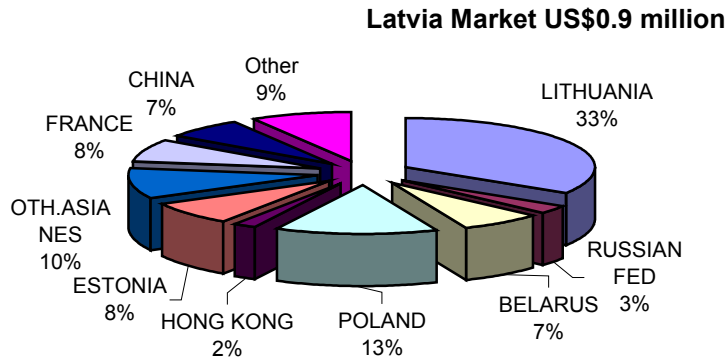


Figure 45: Prospective Market of Latvia - 1997 Scenario

Latvian US\$0.9 million bicycle market was supplied through Lithuania, which had a 33% share. Asian countries had a roughly 20% share, of which China held 7%, Hong Kong 2% and other Asian countries accounted for 10%.

Lithuania Imports:

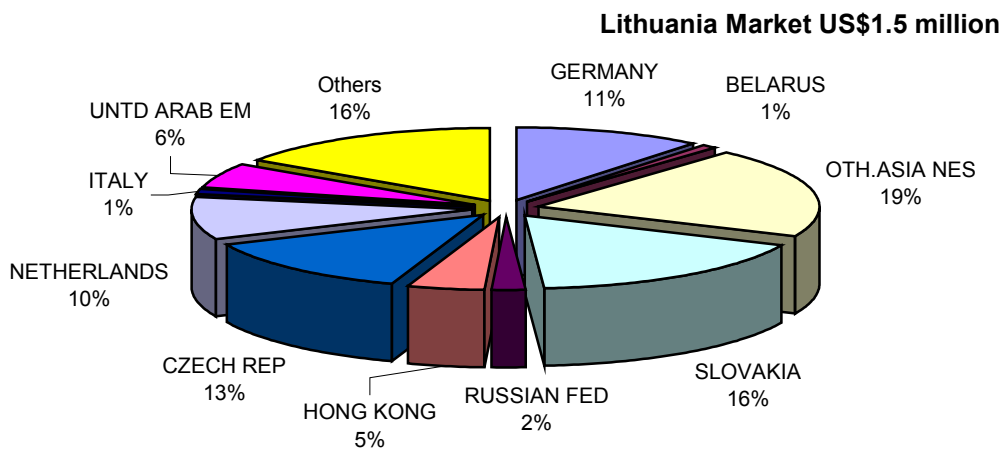


Figure 46: Prospective Market of Lithuania - 1997 Scenario

Asian countries held a roughly 30% share in the Lithuanian US\$1.5 million bicycle industry. Hong Kong accounted for 5%, UAE held 6% while other Asian countries, presumably Taiwan, held 19%.

Romania Imports:

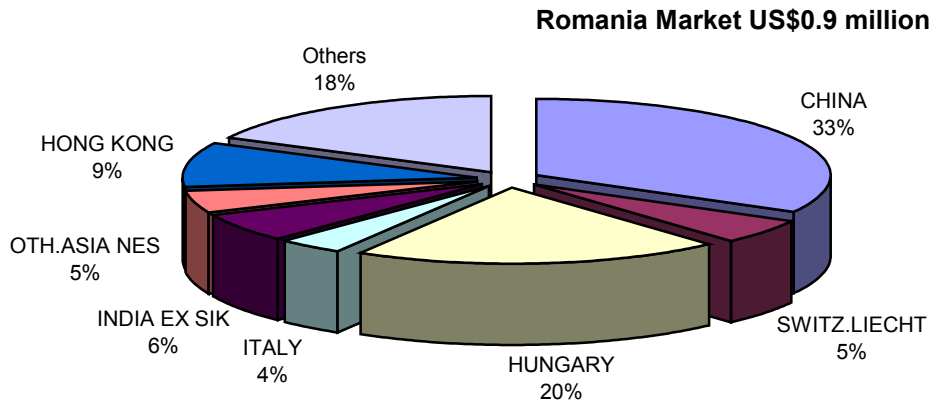


Figure 47: Prospective Market of Romania - 1997 Scenario

China was the dominant player in the Romanian market with 33% of the bicycle market share. Hong Kong with 9% and India with 6% were also present. Overall, Asian countries accounted for more than 50% of the Romanian market.

Estonia Imports:

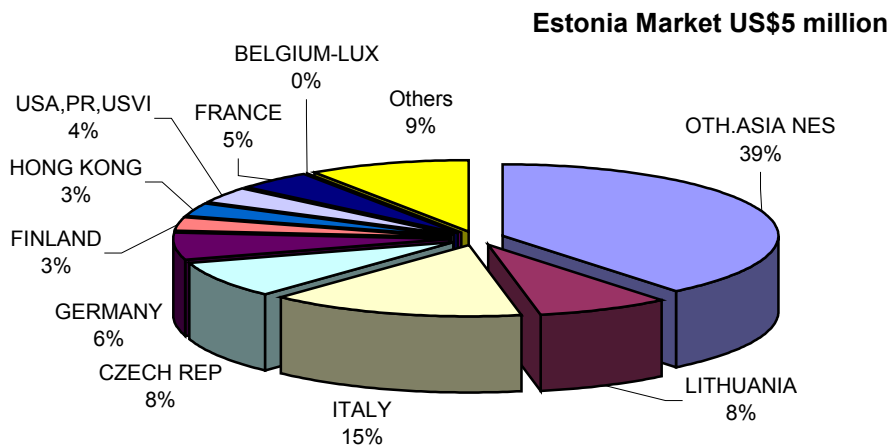


Figure 48: Prospective Market of Estonia - 1997 Scenario

Asian countries held a 42% share of the Estonian market US\$5 million bicycle industry in 1997, of which Hong Kong accounted for 3% while other Asian countries, presumably Taiwan, held the rest.

Slovakia Imports:

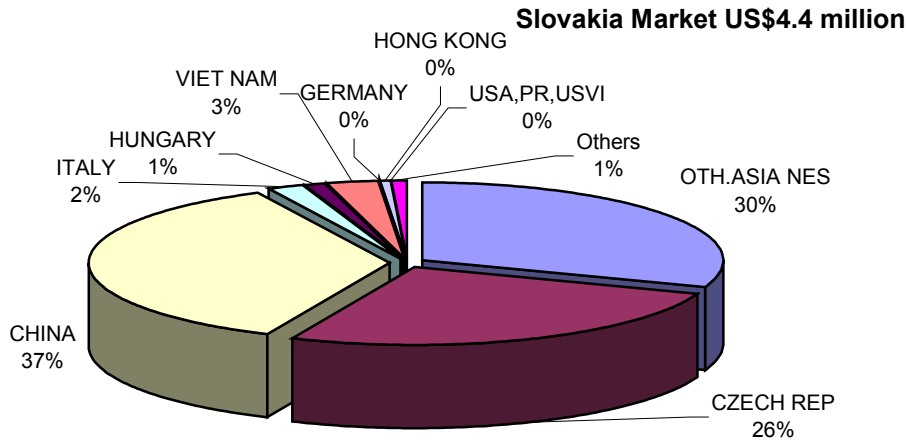


Figure 49: Prospective Market of Slovakia - 1997 Scenario

Asian countries held nearly 70% of the Slovakian US\$4.4 million bicycle industry. Of this 70% share, China alone accounted for 37% and Vietnam held 3%. Other Asian countries, presumably Taiwan, held the rest.

Russian Imports:

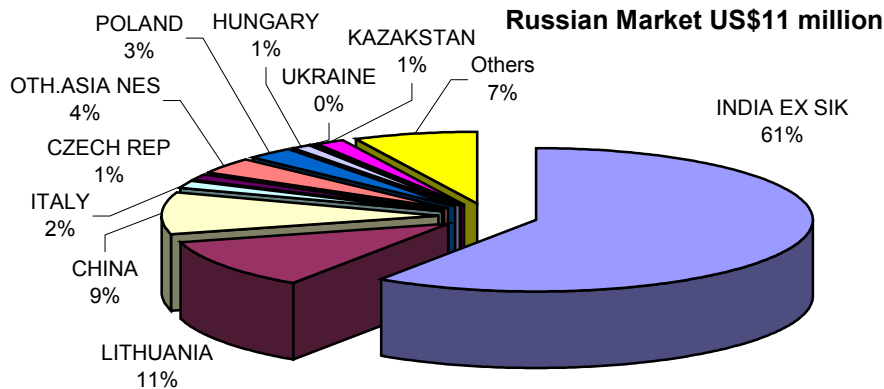


Figure 50: Prospective Market of Russian - 1997 Scenario

India held a 61% market share of the Russian market. This may be in the shape of barter trade. China accounted for another 3%. Overall, Asian countries held a roughly 68% of the Russian bicycle market.

Hungarian Imports:

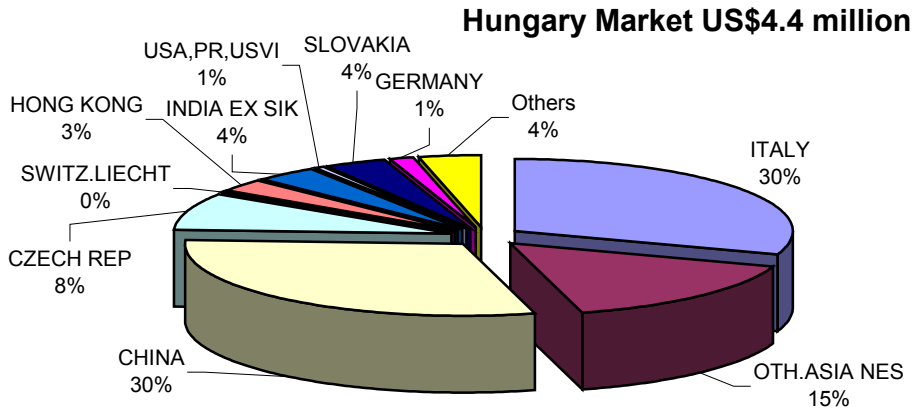


Figure 51: Prospective Market of Hungary - 1997 Scenario

China held a majority share of 30% in the Hungary market. India accounted for 4% while Hong Kong accounted for another 3%. Overall, Asian countries held more than 50% of the Hungarian bicycle market.

Czech Imports:

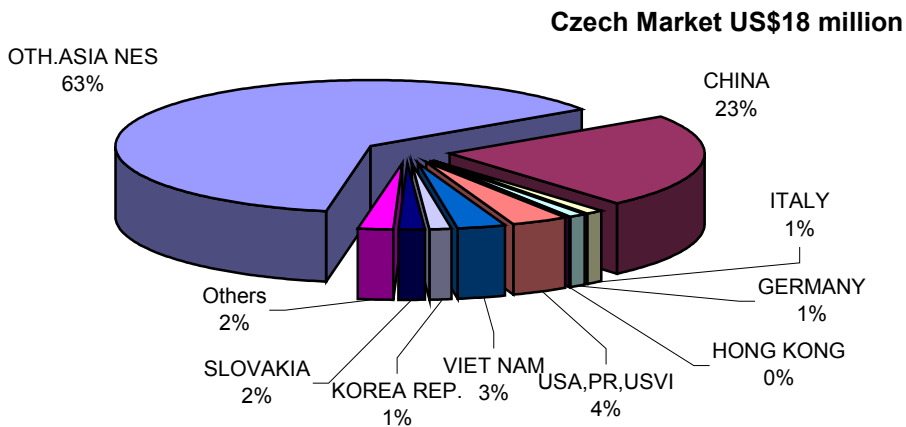


Figure 52: Prospective Market of Czechoslovakia - 1997 Scenario

China held 23% of the Czech bicycle market, with Korea and Hong Kong having small share as well. Overall Asian markets, probably Taiwan, held a majority share of more than 85%.

Poland Imports:

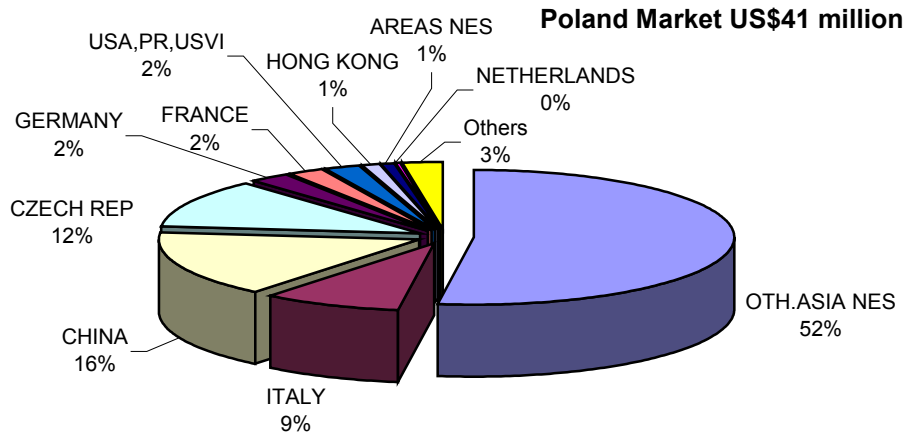


Figure 53: Prospective Market of Poland - 1997 Scenario

China held a market share of 16%, while Hong Kong held a 1% share. Overall Asian countries accounted for roughly 70% of the Polish bicycle market share. Presumably, Taiwan held the biggest share amongst Other Asian countries.

Chapter 9. Plan of Action

9.1 Future Developments:

We have bought 2 Indian, 2 Pakistani and a Chinese bicycle which have been weighed and will be destructively tested for quality purpose.

Components	Eagle	Sohrab	Hamilton	Hero	Phoenix
Frame	4.5 (with chain wheel)	3.73	3 (single bar)	3.68	4.1
Front Fork	1.16	1.13	0.95	1.04 (inc. stopper)	0.94
Handle	1.64 (inc. 4 grips)	1.66 (inc. 4 grips)	1.39 (inc. 2 grips)	1.42 (inc. 2 grips)	1.41 (inc. 2 grips)
Mudguard (FT)	0.4	0.39	0.28	0.32	0.26
Rear	0.7	0.88	0.6	0.65	0.5
Rim (FT)	1.92	1.95	1.57	1.63	1.71
Rim Rear (inc. tire, tube, valve)	3.66	3.65	3.06	3.07	3.34
Chain Wheel	(inc. in frame)	0.72	0.67	0.66	0.76
Crank (inc. nut and bolt)	0.37	0.37	0.34	0.34	0.36
Saddle	1.86	1.87	1.74	1.86	1.05
Chain	0.47	0.48	0.4	0.37	0.48
Brake	0.2	0.16	0.17	0.15	0.15
Pedal	0.86	0.88	0.59	0.32 (one side)	0.69
Chain Cover	0.32	0.25	0.80 (full)	0.24	0.94 (full)
Misc (other small components)	0.89	0.83	0.67	0.65	0.82
Chain Stay	0.28	0.27	0.39	0.35	(inc. with frame)
Carrier	1.42	1.42	1.68	1.27	1.07
Stand	1.2	1.34	1.01	1.05	1.04
Bell			0.18	0.2	0.18
Tire	0.9 (B.Stone)	0.93 (Ceco)	0.85	0.8	0.73
Tube	0.34 (B.Stone)	0.30 (Service)	0.26	0.26	0.26
Total	23.09	23.21	20.6	20.65	20.79

Table 22: Comparative Weights of Bicycles

Chinese and Indian manufactured bicycles are approximately 2.5kgs less than Pakistani manufactured bicycle.

COMPARISON OF MUDGUARD DIMENSIONS

Mudguard	Eagle	Sohrab	Hero	Hamilton	Phoenix
Front	Length: 33" Width: 3.75"	Length: 33" Width: 3.5"	Length: 29.5" Width: 3.5"	Length: 28.5" Width: 3.5"	Length: 31" Width: 3.5"
Back	Length: 51" Width: 3.75"	Length: 50" Width: 3.5"	Length: 49" Width: 3.5"	Length: 48" Width: 3.5"	Length: 48.5" Width: 3.5"

COMPARISON OF MUDGUARD'S ROD DIMENSIONS

Mudguard	Eagle	Sohrab	Hero	Hamilton	Phoenix
Rod/each	Length: 16.5"	Length: 16.25"	Length: 16"	Length: 16"	Length: 16.5"
Rod's Thread	-	Length: 3cm	Length: 2cm	Length: 2.4cm	-

* Eagle & Pheonix has a joint rod & there is no Thread with the rod

Table 23: Comparison of Bicycle Part Dimensions**9.2 Testing:**

The testing of these bicycles have been started with initial testing done on bicycle tires and tubes. The results were:

Tire Test Results		Pakistani				Indian		Chinese	
		Nylex	Servis	Ceco	Falcon	Hero	Hamilton	Phoenix	
		Blackstone	LongLife	Shanghai	King Kong	Hero-Ralson	Hamilton	Double Coin	
Weight	gms	970	926	944	995	830	846	740	
Cord Used		Nylon	Nylon	Cotton	Cotton	Cotton	Cotton	Nylon	Nylon is better
Ply to ply	kg/cm	7.51	2.96	4.31	3.46	2.4	4.06	4.5	Higher is better
Diameter of wire	mm	2	1.9	2	2	0.9*3	0.9*3	1.9	
Specific Gravity		1.2888	1.2662	1.2735	1.3887	1.2955	1.2985	1.311	
Abrasion	mm ³	39.9607	54.8879	36.9833	64.1597	51.7957	44.0523	40.503	Lower is better
Abrasion (Plain)	mm ³	33.3652	48.8068	N/A	55.3747	45.1572	36.736	29.2903	Lower is better

Tube Test Results		Pakistani		Indian	Indian	Pakistani	Chinese	
		Servis	Nylex	Hero	Hamilton	Mian	Phoenix	
		Supreme	B/Stone	Hero-Ralson	Hamilton	Panther	D.Coin	
joint type		O/Joint	O/Joint	O/Joint	Moulded	Moulded	Moulded	
weight	gm	322	357	285	270	385	270	
Nozzle strength	kg	25	22	30	41	25	26	higher value is better
thickness	mm	1.32	1.33	1.07	1.22	1.425	1.135	
tensile strength	fkg/cm ²	119.5	110	132.5	121.65	121.5	138.55	higher value is better
elongation	%	662.5	637.5	450	412.5	737.5	525	judge against standard
joint strength	fkg/cm ²	6.02	5.36	8.1	62.8	67.4	30.3	higher is better

Pedals	Pakistani		Indian		Chinese	
	Sohrab	Eagle	Hero	Hamilton	Phoenix	
Specific Gravity	1.505	1.536	1.505	1.438	1.641	Lower value is better

Table 24: Test Results of Tires and Tubes

The comparison between bicycles of different origin will help us determine their strengths and our weaknesses.

Indian bicycles were Zinc electroplated while Chinese and Pakistani bicycles are Ni-Cr electroplated. This increases their cost. Similarly, the Indian bicycles are more aesthetically pleasant than Pakistani bicycles and their tire and tube are of a better quality.

All these quality aspects need to be looked into.

Chapter 10. Appendices

10.1 List of Key Institutions:

Manufacturer of Bicycle:

- Pakistan Cycle Industrial Co-operative Society Ltd - Sohrab
 1. S. Z. Rahman Moulvi - Director/Secretary. National House, 47-The Mall. Lahore.
Ph: +042-7312076, 7312026-28. Fax: 7235143
 2. Salman Rehman - Marketing Manager
Ph: +042-7312026-28. Fax: 7235143
 3. Muhammad Asim Akram - Director Works. Rustam & Sohrab Factory, Sheikhpua Road, Shahdara. Lahore
Ph: +042-271219, 7920101-06. Fax: 270717

- Raheem Industries - Hero Sports Division Bicycle:
 1. Ch. Muhammad Ali - Chairman (also President Lahore Cycle Dealers Trade Group).
1st Floor, Abid Chmaber, 12 Maclagun Road, Nila Gumbad. Lahore.
Ph: +42-7351072, 7224105
 2. Ch. Muhammad Yasin Ali - Chief Executive. 1st Floor, Abid Chmaber, 12 Maclagun Road, Nila Gumbad. Lahore.
Ph: +42-7351072, 7224105

- Pakistan Engineering Company - PECO Cycles
 1. Maqbool Rizvi - G.M. Marketing. 6 Ganga Ram Trust Building, the Mall, Lahore.
Tel: 7320227 Fax: 7323108

- Briter Cycle Industries - Falcon Cycles
 1. Umar Farooq Butt - Director. 24 Industrial Estate, Kot Lakhpat, Lahore.
Ph: +42-5152118
 2. Shafi ur Rehman - Manager. 24 Industrial Estate, Kot Lakhpat. Lahore
Ph: +42-5152118

- Capital Cycle Industries Ltd. - Eagle Cycles

1. Tipu Sultan - Manager Accounts. Ahmad (Luxmi) Building, Mcleod Road. Lahore.

Ph: +42-7243352, 7220567. Fax: +42-7322528

2. Arshad Mehmood - Production Manager. Industrial Area, Gulberg II, Near Pepsi Factory, Lahore.

Tel: +42-878969. Fax: +42-7322528

- Mehran Cycle Industries Ltd. - Price Cycle

1. Amin Ali Sadaruddin - Chief Executive. L-10B, Block 21, F.B. Industrial Area, Karachi.

Tel: +21-6326572. Fax: +21-2416816

- Sony Cycles

1. Khalil Ahmed - Chief Executive. Qureshi Street, Sandah. Bund Road. Lahore.

Tel: +42-7238497.

Manufacturer of Bicycle Parts:

- Febcon Engineering

1. Iftikhar - Proprietor (General Secretary, All Pakistan Cycle Parts Vendors Association). 236-Q, LCCHS. Lahore.

Ph: +42-760922, 5728894

- Shaheen Industries

1. Mohammad Jahangir Abid - Proprietor (President, All Pakistan Cycle Parts Vendors Association). 60/A, Abdul Sattar Park, Pindi Stop, Kot Lakhpat. Lahore.

Ph: +42-5118925, 851687

- Novelty Group of Companies

1. Ikram-ul-Haq Chaudhary - Chief Executive. 69 Fruit Market, Iqbal Town, Lahore.

Tel: +42-7830060.

- Mian Tire and Rubber Co Pvt Ltd

1. Fida Hussain - General Manager. 29.5 km, Lahore-Sheikhupura Road. Sheikhupura.

Ph: +42-6405, 6705. Fax: +42-6661674

- Darson Industries Pvt Ltd

1. Sajjad Rubbani Butt - Director. G.T. Road, Darson Road, Wazirabad.

Ph: +437-603616. Fax: +437-600053

- Servis Industries Limited

1. Hassan Javed - Resident Director. G.T Road, Gujrat.

Ph: +4331 521061-4, Fax: +4331-521068

Bicycle Retailers

- Universal Sales Pvt Ltd

1. Azhar Saeed Chishti - Distributor Sohrab Bicycles. 47 National House, the Mall. Lahore.

Ph: +42-7352511, 7322571

- Gul Brothers Cycle Works

1. Mohammad Ajmal Khan- Proprietor. Shop No 12, GT Road, Qutba More, Kamra Cantt. Attock.

Ph: +597-640102

- Punjab Cycle Store

1. Khalid Siddique - Proprietor. 3 Raleigh House, Lahore.

Ph: +42-7231296, 7355847

- Khawar Cycle Store

1. Khawar Tanveer Malik - Proprietor (General Secretary, Lahore Cycle Dealers Trade Group). Nila Gumbad. Lahore.

Ph: +42-7322364, 7354070.

10.2 Bibliography:

1. Lester Brown; Micheal Renner and Brian Halweil. *Vital Signs 1999: the Environmental Trends that are Shaping our Future*. World Watch Institute. <http://www.worldwatch.org>
2. BikNet. <http://www.biknet.com.tw>
3. Taiwan Bicycles and Parts Guide, 1999-2000. Trade Winds.
4. PC-TAS/UN Trade Statistics of 1997.
5. Interbike Directory. <http://www.interbike.com>
6. Biknet International Directory. <http://www.biknet.com.tw/~bikint/report/>
7. Taiwan Bicycle Industry Background Information. <http://www.biknet.com.tw/~bikint/report/tw-ind.htm>
8. Taiwan Bicycle Industrial Report - 1997. <http://www.biknet.com.tw/97-report.htm>
9. World Market Report - International Bicycle Market Statistics. Interbike Directory.
10. Government of Pakistan. 50 Years of Pakistan in Statistics 1947-1997. Volume I, II, III & IV. Federal Bureau of Statistics, Statistics Division.
11. Transport Demand of Modes not Covered in International Transport Statistics. Published by Cycling. European Cyclists Federation (ECF), December 1997.
12. China Online. <http://www.chinaonline.com>
13. Hero Cycles Website. <http://www.herocycles.com>
14. China's Statistical Bureau
15. Economic Times of India - 3rd May 1999
16. Netherlands Report from CBI
17. <http://www.bicycleretailer.com>
18. International Bicycle Fund. <http://www.ibike.org>
19. Austral Bike Book News. <http://austral.bikebook.com.tw>
20. Thailand to Promote Bicycle Use. <http://tradeport.org/ts/countries/thailand/mrr/mark0146.shtm>
21. National Bicycle Dealers Association. <http://www.nbda.com>
22. Bicycle News Agency. <http://www.bikenews.org>

10.3 *The Installment Plan:*

The initial proposal for the bicycle industry was an installment plan for bicycles on the line of the Yellow Cab Scheme.

The proposal was to involve the government in the early stages of the plan for an assurance to the manufacturer that 1 million bicycles would be bought and financial involvement in the form of payment of interest on the bicycles would be guaranteed. The manufacturer, in turn, would reduce the price of bicycle on assurance of guaranteed sale and payment. The manufacturer would be able to decrease overheads by better forward planning.

Eventually, the customer would pay the installments as well as the interest and the financial involvement of government after one year would be zero.

A board was to be set up which would distribute these bicycles through employers. In order to guarantee payments, the bicycles would be sold to companies, which would buy them in bulk and distribute amongst their employees. The companies would also guarantee payment to the board.

The idea was to start this plan from NWFP and Balouchistan in order to meet the threat of Chinese bicycles head on in those provinces. The plan could be started for industrial labor and Federal and Provincial Government employees of lower cadre.

The aim of the installment plan was to:

- **Break Chinese Bicycle Market** by starting this installment plan from NWFP and moving it to Balouchistan and other provinces. The current ratio of Chinese bicycles to Pakistani bicycles in NWFP is probably 25:1 or more. In Balouchistan, this ratio goes down to 4:1. In other provinces this ratio is in manageable proportion. By tackling the Chinese bicycles on their home ground, the influx will not only stop but people who want to buy a bicycle will opt for a Pakistani brand.
- **Encourage people to buy bicycles** by selling bicycles on installments. This will encourage people who had been saving money to buy a bicycle. Similarly, households who do not have a bicycle now may decide to buy a bicycle when the price comes down or they feel that they can afford the bicycle on an installment plan.

- **Bring in Replacement Buyers** who are currently spending more money on monthly maintenance of their bicycle. In our survey, there were a lot of people who indicated that they were spending more than Rs.150 per month on the maintenance of their old bicycles. There were other people whose bicycle was more than 10 years old. These are the people who can buy a new bicycle on easy monthly installment in order to cut down their maintenance cost.
- **Encourage Low Income Buyers** who cannot afford a bicycle at this price and cannot afford high monthly installments. These are the people who either walk to a job or use public transport when they find a job. By selling bicycle on easy monthly installment, these people will be encouraged to own their bicycle.
- **Public transport users** will also be encouraged to use bicycles as a lot of people indicated that they pay Rs.10 per day on public transport, amounting to roughly Rs.250 per month. By giving them a bicycle on easy terms, they will be actually saving money.

If 1 million cycles are sold, then the sales tax earned will be Rs.218 million or Rs.218 per bicycle. The customer will pay Rs.300 as the down payment and later pay 11 installments of Rs.175 each and 1 installment of Rs.45. The total interest over the 12-month period will be Rs.170 million or roughly Rs.170 per bicycle. Thus at the end of the 12 month period, the bicycle will cost Rs.2270 to the customer.

If customer bears all the interest charges:

In this case, the customer will pay Rs.170 as interest. This amounts to roughly Rs.14.17 per month over a 12-month period. The government will pay nothing and will not bear any charges.

Per bicycle:

Total Interest, Rs.	Government Pays Rs.	Customer Pays Rs.	Average monthly interest, Rs.
200	0	170	14.17

If government bears half the interest charges:

In this case, the customer will pay Rs.85 as interest and Rs.85 per bicycle will be borne by the government. So the customer will be paying roughly Rs.7 per month for a 12-month period.

Per bicycle:

Total Interest, Rs.	Government Pays Rs.	Customer Pays Rs.	Average monthly interest, Rs.
200	85	85	7.08

If Sales tax is withdrawn:

If sales tax of Rs.218 per bicycle were withdrawn, then the total subsidy would amount to roughly 218 million for 1 million bicycles. This will lower the price of bicycle to Rs.1882, and after paying a down payment of Rs.300, the customer will pay Rs.175 for 10 months and Rs.50 for the 11th month. The withdrawal of sales tax will result in installment period of 11 months.

If customer bears all the interest charges:

The total interest over the 11-month period comes out to be roughly Rs.152.7 per bicycle. This works out to be approximately Rs.13.89 per month over a 11 month period. At the end of the 11-month period, the total expenses incurred by the government will amount to zero.

Per bicycle:

Total Interest, Rs.	Government Pays Rs.	Customer Pays Rs.	Average monthly interest, Rs.
152.7	0	152.7	13.89

If government bears half the interest:

In this case, the customer will pay Rs.76.35 as interest and Rs.76.35 per bicycle will be borne by the government. So the customer will be paying roughly Rs.7 per month for a 11-month period.

Per bicycle:

Total Interest, Rs.	Government Pays Rs.	Customer Pays Rs.	Average monthly interest, Rs.
153.3	76.35	76.35	7

Problem:

The problem with the installment plan is that if a person who was not employed and they wanted to buy a bicycle, then the only possible way to guarantee payment of installment was an insurance policy. This made the bicycle expensive and hence the installment plan was scrapped. Instead, it was decided to consider an export market for bicycles.

10.4 Picture of Components:



Figure 54: Picture of a Bicycle with Components

Axle:



Brake:



