



Changing Dimensions of Export of Leather and Leather products in India – A Markov Chain Analysis

KEYWORDS

Leather – export – India – Annual compound growth rate – Markov chain analysis

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ABSTRACT

Leather Industry in India, occupies a place of prominence in the Indian economy, in view of its massive potential for employment, growth and exports. The industry covers a vast spectrum of inputs, activities, skills and products i.e. livestock, hides and skins, tanning, leather products and exports. The tanning industry is concentrated in three states viz. Tamil Nadu, West Bengal and Uttar Pradesh. The other important states are Maharashtra, Andhra Pradesh and Punjab. The main products made out of leather are footwear, leather garments, leather goods such as hand bags, belts, wallets, gloves, sports goods, harness and saddlery, upholstery etc. In this article, the growth rate of leather export was measured by fitting an exponential time trend of the form. The growth rate was the highest for finished leather (14.77 per cent) followed by leather goods (13.79 per cent), leather foot wear (11.35 per cent) and foot wear components (6.3 per cent); it was the lowest for leather garments (4.8 per cent). For finding out the changes in the structure of the leather export of India, Markov chain analysis was used. The results indicated that the stability in leather export of India was higher with Germany and Spain. The stability was meager with UK and other countries. The leather exports to USA, Italy, Hong Kong and France were completely unstable.

INTRODUCTION

Leather Industry in India, occupies a place of prominence in the Indian economy, in view of its massive potential for employment, growth and exports. There has been increasing emphasis on its planned development, aimed at optimum utilisation of available raw materials for maximising the returns, particularly from exports. The Indian leather industry contributes export earnings of Rs.8650 crores (US \$1800 million in 2002-03) and provides employment to nearly 2.5 million. It is now poised for a big leap to double its global share from the present 3%. (FIEO News, 2004)

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Hides and Skins

Hides (from cattle and buffaloes) and skins (from goats and sheep) are obtained from their slaughter and mortality. The availability of hides and skins is determined by the demand for meat, and the rate of mortality. In other words, the supply is inelastic to the demand from the leather industry. About 60% of hides and 90% of the skins are obtained from slaughter. It is well known that in India, cattle and buffaloes are reared for milk and draught, and they end up being slaughtered when they become unproductive. On the other hand, goats and sheep are basically reared for meat.

Leather Products Industries

The main products made out of leather are footwear, leather garments, leather goods such as hand bags, belts, wallets, gloves, sports goods, harness and saddlery, upholstery etc. Of all these items, it is footwear that consumes about 60% of the total leather production. The manufacture and export of leather products is systematically promoted as their value addition is 4 to 5 times that of raw material.

DATA AND METHODOLOGY

Analytical Tools Employed

- (i) Conventional analysis in the form of percentages
- (ii) Compound Growth rate analysis

The growth rate of leather export was measured by fitting an exponential time trend of the form (Ramesh chand and Tewari, 1991 and Veena et al. 1995)

$$Y_t = b_0 (b_1)^t$$

$$\ln Y_t = \ln b_0 + t \ln (b_1)$$

The annual compound growth rate (r) was given by

$$r = \text{Anti-In} (b) - 1$$

(iii) Markov Chain Analysis – Transitional Probability Matrix
For finding out the changes in the structure of the leather export of India, Markov chain analysis was used. Markov analysis is an application of dynamic programming to the solution of a stochastic decision process that can be described by a finite number of states (Daniel, 1962). Any sequence of trials (experiments) that can be subjected to probabilistic analysis is called as stochastic process. For a stochastic process, it is assumed that the movements (transitions) of objects from one state (possible outcome) to another are governed by a probabilistic mechanism or system. A finite markov process is a stochastic process whereby the outcome of a given trial t (t = 1, 2... T) depends only on the outcome of the preceding trial (t-1) and this dependence is the same at all stages in the sequence of trials.

Consistent with this definition, the structural change in leather export of India was examined by using the Markov chain approach. Central to Markov chain analysis is the estimation of the transitional probability matrix P. The element P_{ij}, of this matrix indicates the probability that export will switch from category i to category j with the passage of time. The diagonal element P_{ii} measures the probability that the export share of ith country will be retained (Sreenivasamoorthy and Subramanyam, 1999). The value of export of particular country was considered to be a random variable which depends only on its previous exports and this dependence is the same among all periods. A process satisfying these conditions is called a first order stationary Markov chain.

RESULTS AND DISCUSSION**Export Performance of Indian Leather:**

The annual Compound growth rate of export of leather and leather products in India over a period of six years from 1996-97 to 2001-02 is given in Table 1.

Table 1.

India's Exports of Leather & Leather Products (1996-97 to 2001-02) (Figures in Crores# Rs.)

Year	Finished Leather	Leather Footwear	Foot wear Components	Leather goods	Leather Garments	Total
1996-97	1065	1212	833	1123	1545	5778
1997-98	1065	1062	853	1378	1547	5905
1998-99	1132	1238	1040	1973	1573	6956
1999-00	1035	1433	995	1823	1381	6667
2000-01	1658	1706	1091	2236	2156	8847
2001-02	2181	1880	1112	2108	1806	9087
Annual Compound Growth rate (%)	14.77253	11.35152	6.300361	13.79103	4.815457	10.30995

Table 2.

Transitional Probability Matrix for India's Export of Leather and Leather Products (1995-96 to 2000-01)

	U.S.A.	Germany	U.K.	Italy	Spain	Hong Kong	France	OTHERS
U.S.A.	0	0	0	0.45876	0	0	0	0.54124
Germany	0	0.7048051	0	0	0	0	0.12085	0.1743452
U.K.	0	0	0.078389	0	0.145612	0	0.09902	0.6769784
Italy	0	0.5047198	0.28395	0	0	0	0.058415	0.1529153
Spain	0.464542	0	0	0	0.498809	0	0.036649	0
Hong Kong	0	0	0	1	0	0	0	0
France	0.416163	0	0	0	0	0.5838369	0	0
OTHERS	0.499273	0	0.369242	0.046903	0	0.02571513	0	0.05886688

As could be seen from the table, the transition probability matrix indicated that India could not retain its previous export to USA during the study period. The entire share of USA was directed to Italy and other countries alone. Nearly 46 per cent of the USA's share of leather imports from India was lost to Italy and the remaining 54 per cent was lost to others. However, USA has higher probability to gain other countries import market (0.499) followed by Spain's import market (0.46) and of France (0.41).

A major share of India's previous leather export to Germany's market was retained to the tune of 70 per cent during the current period. Of the remaining 30 per cent, 12 per cent was diverted to France and 18 per cent to other countries. Also, Germany has probability to gain 50 per cent of the market share of Italy alone. India's previous leather export to the UK market was retained to the level of only 8 per cent during the current period. The remaining 72 per cent was diverted to Spain (14 per cent), France (10 per cent) and other countries (68 per cent).

During the current period India's leather export to Italy could not be retained. Italy lost its import market share to Germany (50 per cent), UK (28 per cent), France (6 per cent) and others (16 per cent). And has a probability to gain 46 per cent of the Indian leather export to USA, 5 per cent of the others and the entire import share of Hong Kong.

India retained about 50 per cent of her previous years leather export to Spain. Of the remaining 50 per cent, a major share of 46 per cent was diverted to USA and 4 per cent to France. Spain gained about 15 per cent of the Indian export to UK.

India could not retain the previous leather export to Hong Kong market. Hong Kong lost its entire leather export from

The annual compound growth rate analysis has shown that India's export of all kinds of leather and leather products was positive during the study period showing the potential and prospects for future export. The growth rate was the highest for finished leather (14.77 per cent) followed by leather goods (13.79 per cent), leather foot wear (11.35 per cent) and foot wear components (6.3 per cent); it was the lowest for leather garments (4.8 per cent).

Direction of trade and Changing pattern of Indian leather Exports:

The transitional probability matrix presented in table 2, depicts a broad indication of the changes in the direction of trade of leather and leather products. The time period considered is for six years (1995-96 to 2000-01).

The seven major importing countries taken for this analysis were USA, Germany, UK, Italy, Spain, Hong Kong, France with the remaining importing countries grouped as others.

India to Italy. However, Hong Kong gained 58 per cent of the import share of France and 2.6 per cent of the import share of other countries.

Similar to USA, Italy and Hong Kong, the previous period export of leather to France could not be retained during the current period. 58 per cent of India's export to France was diverted to Hong Kong and 42 per cent to USA.

With regard to other countries, only 6 per cent of the previous period leather imports from India were retained during the current period. The remaining 94 per cent was diverted to USA with a major share of 50 per cent followed by UK (37 per cent), Italy (4.5 per cent) and Hong Kong (2.5 per cent). However, the other countries gained 54 per cent of the leather import from India of USA, 17 per cent of Germany, 68 per cent of UK and 15 per cent of Italy.

From these results it could be inferred that the stability in leather export of India was higher with Germany & Spain. The stability was meager with UK and other countries. The leather exports to USA, Italy, Hong Kong and France were completely unstable.

CONCLUSION

The complexion of global trade is changing fast with issues relating to environment (eco-labelling), social cost (labour welfare, child labour), human rights (system of governance) becoming integral parts of trade. Increasing emphasis on resource utilization / recycling / bio-degradability are also concerns of present manufacturing / trading communities. These are the emerging realities of world trade and the Indian leather sector has to be prepared to face these new challenges.

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