PERFORMANCE OF SELECTED EXPORT INDUSTRIES OF PUNJAB SINCE 1990 – AN ANALYSIS

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By

Manish Gupta

Guide

Dr. Jasdeep Kaur Dhami

Faculty of Business and Arts

LOVELY PROFESSIONAL UNIVERSITY

Phagwara

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DECLARATION

I declare that the thesis entitled **"Performance of elected Export Industries of Punjab since 1990-An analysis"** has been prepared by me under the guidance of **Dr Jasdeep Kaur Dhami**, Professor Department of Management, Lovely Professional University**.** No part of this thesis has formed the basis for the award of any degree or fellowship previously.

DATE:

Manish Gupta
Department of Management,
Lovely Professional University
Phagwara, Punjab

CERTIFICATE

I certify that Manish Gupta has prepared his thesis entitled "Performance of elected Export Industries of Punjab since 1990-An analysis" for the award of PhD degree of Lovely Professional University**,** under my guidance. He has carried out the work at the Department of Management, Lovely Professional University.

DATE:

Dr. Jasdeep Kaur Dhami
Department of Management,
Lovely Professional University
Phagwara, Punjab.

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ABSTRACT

In this study exports performance of six selected (readymade garments and hosiery, sports good, leather good, yarn and textile, hand tools/machines and cycle and cycle parts) industries from Punjab since 1990 had been analyzed. Punjab has achieved remarkable growth since independence and is now one of the richest States of India. The success of industrialization in the context of dependence of industrialization not only on the capability of agriculture to generate surpluses but also on whether and how these surpluses could be channeled into industrial development. Punjab is mainly an agrarian state with 85.6 per cent of its total area under cultivation. It also accounts for 1 per cent of the world's rice production and 2 per cent of the world's wheat and cotton production. Being biased towards agriculture, much industry situated in the state is food and beverage based.

The various studies had conducted on India/Punjab industrial export performance at national as well as State levels. These industries were playing very important role in terms of exports, employment, output, profitability and scope of development. Before the liberalization period the industrial exports was not able to achieve economies of scale, employment level etc. Various studies stated that after the liberalization period, there were huge increments in exports of Punjab as well as India at large scale due to up gradation of technology, increasing economies of scale. Another important factor that played important role was education which further leads to skilled labour and investment by MNC's. To sum up, growth of industrial exports leads to economic development of nations as well as states.

No country, state or region can make progress on the basis of primary productive occupations alone, especially when such a region has a large and rapidly increasing population. To achieve increasing income, higher standard of living, higher purchasing power, greater opportunities for jobs and over all development, better and efficient use of natural and agricultural resources is essential. Punjab is basically an agricultural state but after liberalization it shift from agriculture to industries and noticed a huge increments in industrial exports. The main industrial districts in Punjab are Ludhiana, Jalandhar and Amritsar and account for 90 per cent of exports from Punjab. Ludhiana is

known for yarn and textile/Readymade garments/hosiery/Bicycle and bicycle parts industry, Jalandhar is known for Leather, sports and hand tool industry and Amritsar is also known for its Yarn and Textile /Ready Made Garments/ Hosiery industry. Punjab has highly developed small scale industries and has surplus of various small scale and other industrial and manufactured products such as bicycles, sewing machines, hosiery goods, leather goods, tools etc. Besides these medium and major industrial units, a large number of small scale and tiny units are also engaged in the manufacture of the same products. Export of Punjab was Rs. 10819 crore out of the total exports of Punjab Rs.19366 crores in 2012-2013. A large part of (about 94.5 per cent) of industrial exports of Punjab originated from its three major industrial districts; namely Ludhiana (51 per cent), Amritsar (18 per cent) and Jalandhar (21.7 per cent) in 1999-2000 and in the year 2001-2002 total exports from Jalandhar was Rs. 94764 Lakh , Amritsar Rs. 69512 Lakh and from Ludhiana Rs. 230364 Lakh. Punjab's total export in 2001-2002 was worth Rs. 440790 Lakh. From 2001-02 to 2011-12 the export as percent of GDP was 4.82. The per cent of ratio export to import was 70.37 per cent. There are no more variations in the share from the year 1989-90 to 2011-12. Only in the year 1997-98 this share increased to 3.32 but again this share reduced to 2.12 per cent in the year 2001-02. After 2003-04, it reduced 14 per cent to 7 per cent in 2011-12. Major exports from Punjab in international market are USSR, Arabian Countries, Hong Kong, UK, Italy, USA, France, Malaysia & Singapore, Australia etc. Export Promotion Councils provide useful information and assistance to increase exports from Punjab.

Punjab is a land of boundless opportunity for agriculture as well as industry development. The state has number of small, medium and large-scale industrial units. Major Industries in the state include metals, manufacturing textiles, hosiery, yarn, sports goods, hand tools, bicycles, and light engineering goods. The areas of industrial thrust include agro-industry, electronics, dairy industry, pharmaceutical Industry and white goods industry. There are nearly 194,000 small scale industrial units in the state in addition to 586 large and medium units. Ludhiana is an important centre for industry. The average of total exports of selected industries from 1990-91 to 2001-02 was Rs. 2992 crore. It increased to Rs. 13693 crore during the period 2002-03 to 2013-14.

Technology up gradation and improvement in infrastructure was the main cause to increase in the average of total exports from Punjab. Percentage share of exports increases because industry get R&D benefits and adopt new technology, which save input costs drastically and importing state-of-the-art machinery and the latest technology from Taiwan, especially Cold Forging Technology and Blue Moulding Technology. GDP and Exports had highly positive correlation i.e. 0.953**.** The correlation coefficient between the GDP and EXP was very high and statistically significant at 1 per cent level throughout the study periods. The Augmented Dickey Fuller Unit Root Test was significant on Export with second difference**.** In this case Durbin Watson statistics was 2.26 which means test was reliable (no auto correlation among residuals). ADF was -3.58 which was less than the critical values at 1% level of significance. The series was stationary at second difference. The Augmented Dickey Fuller Unit Root Test on GDP was significant with second difference**.** In this case Durbin Watson statistics was 1.7 which means test was reliable (no auto correlation among residuals). ADF is -4.36 which was less than the critical values at 1%, 5% and 10% level of significance. The series was stationary at second difference. GDP and Export of selected industries has long run relationship**. T**he null hypothesis is accepted i.e GDP does not Granger Cause EXPORT because in this case probability value was more than 0.05. In second case, the null hypothesis is rejected and concludes that EXPORTS Granger Cause GDP. From analysis, the chief findings were that the major sectors which have made significant contribution towards exports from the state were woollen textiles, bicycles and parts, hosiery goods, hand tools, leather products, and sports goods. Technology up gradation and improvement in infrastructure was the main cause of increase in the total exports from Punjab.

Punjab is on its way to rapid industrialization through coordinated development of small, medium and large scale industries. Industrial sector of Punjab plays a significant role in the development of state. Ludhiana leads in industrialization, accounting for more than 35 per cent of the industrial output, 23 per cent of industrial units and 33 per cent of industrial workforce of Punjab Ludhiana is leading player in readymade and

hosiery industry. Ludhiana accounts for about 21 per cent of all industrial units and over 28 per cent of the industrial output of the State. The hosiery and garments sector is much more labour intensive, small scale, employing 5-40 workers per unit. The Ludhiana cluster produces about 60 per cent of the total cycles manufactured in the country in the large and small scale sector and more than 80 per cent of the parts and components in the small and tiny sector. Hero Cycle Ltd. commenced production of complete cycles in 1956 as an SSI unit in Ludhiana and became the world's largest producer of bicycles in 1989, with a record production of 29,36,076 units and entered the Guinness Book of World Records. Jalandhar was main cluster for the sports good industry in Punjab. Jalandhar contributes 55-60 per cent of the total sports good exports from India. The sports goods industry in Punjab provides direct employment to about 10,000 workers and indirect employment to 40,000 workers. Ludhiana district was worldwide famous for yarn and textile industry. In recent years this industry progressed gradually. Till recent years main trading partner for the export of textile and yarn was the USSR. However, after its disintegration, exports have diversified to other markets, viz., Europe, USA and other advanced countries. Production in the textile and yarn industry achieved an impressive average annual growth rate. Abundance of raw material, trained labour, enabling infrastructure, cluster development and an established industrial ecosystem ensure an ideal environment for the booming textile and yarn industry in Punjab. Jalandhar was the main cluster of leather industry in Punjab. Items produced by this sector include, bags, handbags, hand gloves and industrial gloves, wallets, ruck sacks, folios, brief cases, travelware, belts, sports goods, upholstery and saddlery goods. The main importers of leather goods are USA, European Union, Africa, Hong Kong, Australia. The hand tools industry was concentrated in Jalandhar and Ludhiana. The use of hand tools covers almost all types of industries, viz., engineering, electrical and electronics, construction, plumbing, etc. Absence of these tools would in fact paralyse every type of industrial activity. Unavailability of major raw material such as iron or coal, was a definite hindrance for the establishment of large and medium scale units in Punjab. Punjab Government stepped in to help make large & medium scale

production profitable in Punjab. Punjab has not been able to achieve faster growth of industries in the state because of Unavailability of major raw material. Projections have been made for the industrial exports of Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export goods worth Rs. 43814 crore in 2020-21. Thus, based on Punjab's actual exports, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

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2. INDUSTRIALIZATION AT THE COST OF ENVIRONMENT DEGRADATION- A CASE OF LEATHER AND IRON AND STEEL INDUSTRY FROM PUNJAB ECONOMY", *Innovative Journal of Business and Management* , Jan – Feb (2013) 19 - 21.

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CHAPTER – 1

INTRODUCTION

1.1 INTRODUCTION

International trade helps in widening the size of the market, extending the international division of labour and specialization and expanding the scale of production. Robinson noted that foreign trade has two functions. First, it enables a country to obtain food, materials and other things which it does not possess or in which it does not have a comparative advantage. Second, almost as important, it enables a country to overcome short period bottlenecks resulting from the failure of production or exports to develop as planned, Robinson (1947). International trade helps to improve the economic conditions of an economy. The basic reason for different nations entering into trade is that no nation has the capability to produce by itself all the commodities and services that are required by its people. There has been unequal distribution of productive resources by nature. Nations differ in respect of climate conditions, accessibility of cultivable land, forests, mines, mineral products, labour, capital, technological capabilities and managerial and entrepreneurial skills. Due to these diversities, no country has the potential to produce all the commodities in the most efficient manner or at least cost. International trade has been given pride of place in the economic progress of nations. According to Alfred Marshall, "The causes which determine the economic progress of nations belong to the study of international trade." Roberston expressed it in a different manner. According to him, "international trade is an engine of growth." Haberler explained that, "International trade has a made tremendous contribution to the development of less developed countries in the 19^{th} and 20^{th} centuries and can be expected to make an equally big contribution in the future." International trade ensures the application of principles of division of labour and specialization to the fields of production and international exchange of commodities. Given the specific natural endowments, every nation should concentrate in the production and export of only that commodity of which it has greater comparative advantage. Through international trade, the domestic surpluses in production can be offset through exports and shortages can be

removed through imports. The necessity of promoting restriction free international trade, for ensuring efficient system of exchange and payments adjustments and removing of international liquidity, led to the growth of several multilateral institutions like IMF, IDA, UNCTAD, WTO etc. We are in the era of globalization, liberalization and privatization. International trade has become essential and the trend is towards less restrictions. The establishment of WTO is a move towards liberalization of the world economy. The WTO is a rule based multilateral trading system of the world. It was established on 1st January 1995 by replacing General Agreement on Tariffs and Trade (GATT), which was in existence from 1947 to 1994. India is a founder member of WTO (www.wto.org). The recent political and economic developments over the world have brought into limelight the strategy of growth through the maximum expansion of exports. This strategy assists in domestic specialization in production and consequent expansion of export industries and other complementary industries. The industrial expansion ensures greater generation of employment and which further leads to increase in the level of income and standard of living. The export led growth provides sufficient export earnings that can be ploughed back for the development not only of exports sectors but various other sectors of the economy.

Economic development is one of the most important objectives of each society in the world and economic growth is essential to economic development. There are various contributors to economic growth. Export is considered as one of the extremely essential contributor among them. There are also various concerns about the trade, particularly among the primary and industrial goods exporting nations where the terms of trade are deteriorated against the poorer nations. (Sampath & Anwer, 1997) The huge trade deficits and the alarming balance of payments position have convinced most nations of the need for making all possible efforts to boost their exports. The famous statement of Pandit Jawaharlal Nehru, “export or perish”, explained the importance of exports to a developing economy. A developing economy with an impressive development plan may require large import of capital goods, technology, raw materials and other relevant goods to implement the plan effectively. As imports are financed by exports, the capacity of a nation to import, obviously, depends on its export performance.

Exports are essential for a nation. It makes the economy of the country healthy and strong by maintaining positive trade balances. Exports have become vital especially when the markets are becoming global. Almost all the nations of the world make an effort to develop exports because of the importance of exports to the concerned economy. Exports provide foreign markets, which provide opportunity to achieve economies of scale and growth, earn foreign exchange etc. The present liberalized economy of the country has given a boost to exports from India to almost every nation of the world. Now India is also a partner in international trade and business. The strategy of India's export policy has been changed since 1991. Major changes in exchange rate and reduction of tariff barriers in imports have been introduced. Indian economy is a developing economy and is moving quickly towards the targets of higher rate of growth. In 2013 the growth rate of India's Gross Domestic Product (GDP) was 5.0 percent. Today, sustained export growth or increased openness is good for economic growth. In order to achieve high economic growth, there is a need to exploit export potential at a national level.

Since the execution of the Final Act of the Uruguay Round in 1995, the WTO concords have become main factors in determining the patterns of world trade. Their full impact is not yet understandable as many requirements of these agreements are yet to be implemented because of the transition period provided. Most of the remaining provisions of the WTO concords would be implemented in the coming five years. Therefore, the patterns of trade in 2020 would have to be speculated keeping in mind the impact of full implementation of the WTO concords. (Nagesh, 2001)

According to the World Development Report, during 2002 the GDP of India was USD 501.5 bn, the share of India's GDP in world was 1.6 per cent, and the share of total India's exports in the world was 0.8 per cent. India's share in world total exports has increased from 0.8 per cent in 2004 to 1.3 per cent in 2010. According to the IMF, in the year 2010 the GDP of India was USD 1,631.970 at current prices, the real GDP at current prices in US dollars in India was reported at 1235.98 billion U.S. dollars in 2009. In 2013, the GDP of India was US $ 1.877 trillion. In 2015, India's GDP at current prices in US dollars is expected to be 2185.20 billion U.S. dollars. In 2009,

India's economy share of world total GDP, adjusted by Purchasing Power Parity, was 5.06 per cent. In 2015, India's share of world total GDP is forecasted to be 6.12 percent. In 2011, India‘s economic growth slowed to below 7 per cent and the stock markets reflected the weakening economic situation. Industrial sector output growth briefly slipped into negative territory. On the demand side, fixed investment and consumption growth slowed. Through 2011, India‘s exports were increasing very strongly despite worsening economic conditions in Europe, which is continuously to be India‘s most essential export market. India exports were worth 24618 million USD in February of 2012. Exports amount to 22 per cent of India’s GDP. And it increased by US $ 314415.7 million in 2013. Gems and jewelry constitute the single largest export item, accounting for 16 per cent of exports. India is also leading exporter of textile goods, engineering goods, chemicals, leather manufactures and services. (tradingeconomics.com) India’s exports during 2010-11 amounted to USD 245.9 billion, as compared to USD 178.8 billion recorded during 2009-10. (Report- EXIM Bank).

The present study analyses the Performance of Selected Export Industries of Punjab since 1990. Punjab state is located in northwestern India, bordered on the north by Jammu & Kashmir and Himachal Pradesh, on the east and south by Haryana, and on the west by Pakistan. Punjab covers an area of 50,362 sq. km (19,445 sq. mi). Punjab is basically an agrarian economy. However, the importance of agriculture sector in Punjab economy has declined over the period. The Gross State Domestic Product (GSDP) of Punjab was US$ 2524.16 in 2009-2010. In 2013-14, the GSDP at current price of Punjab was US $ 52.9 billion. And Punjab’s Net State Domestic Product (NSDP) at current prices was US$ 47.6 billion in 2013-14. The growth rate of GSDP was 13.48 per cent in 2009-10, it increased by 14.19 per cent in 2012-13. The growth rate of tertiary sector was 8.95 per cent and it was higher than primary and secondary sector i.e. -0.34 per cent and 3.54 per cent respectively. Tertiary sector in Punjab is growing rapidly than other sectors (Economic Survey, 2013-14). The share of tertiary sector in GSDP of Punjab during 2013-14 was 44.78 per cent. Primary sector contributes 28.94 per cent and secondary sector contribute 26.28 per cent in total GSDP of Punjab during 2013-14 (Government of Punjab, 2013-14). The compound annual growth rate (CAGR) of

GSDP from 2001-02 to 2009-2010, was about 11.8 per cent. Punjab is mainly an agrarian state with 85.6 per cent of its total area under cultivation. Having a fertile plain, nearly cent percent area under irrigation, a favorable climate and an adequate use of fertilizers, it has the highest yield of food grains in the entire country. It also accounts for 1 per cent of the world's rice production and 2 per cent of the world's wheat and cotton production. Being biased towards agriculture, much industry situated in the state is food and beverage based. The textile sector is also vibrant as it is the second largest producer of cotton and blended yarn. It produces 80 per cent of India's bicycle output and is a key player in tractor, auto component and hand tool industries. The share of registered units is much larger. Punjab has done well to provide its population with basic facilities. The network of roads is among the most developed in India, with state and national highways providing convenient access to all parts of the state. It is also well connected with rail to facilitate the movement of goods and food grains to outside markets. Punjab has one international airport at Amritsar and two domestic airports. Few dry ports are located in Ludhiana and Jalandhar.

Punjab ranks 13th amongst all the Indian states in terms of Gross State Domestic Product (GSDP). The state's economy is driven by 2 sectors i.e. Agriculture and services. According to the Planning Commission of India, the state position amongst the top five states interims of per capita income. Punjab State Industrial Investment Development Corporation (PSIIDC) and Punjab Small Industry and Export Corporation (PSIEC) are equally responsible for the expansion of industrial infrastructure in the state. Punjab Agro Industries Corporation (PAIC) is responsible for growth of agro-based units. Punjab not only provides excellent infrastructure for business but also has lucrative offers for new business. Punjab has a very high purchasing power, highest per capita consumption of power and a large consumer durable market. Wealth is evenly distributed. The Government of Punjab is supporting the growth of numerous special economic zones (SEZ) across Punjab. Punjab's total exports of industrial items in the year 1995-96 were 2564.61 crore and in the year 2001-2002 these exports were 4407.90 crore. During the year 2008-09 exports were to the tune of 13888.29 crores whereas it increased to 15972.48 crore during the year 2009-2010. The total industrial exports from Punjab during 2012-13 were Rs. 21301.55 crore. The exports of selected

industries from Punjab during 2013, Readymade Garments and Hosiery export was Rs. 3142.96 crore, Leather Goods exports from Punjab was Rs. 367.47 crore, export of Sports Goods Rs. 1655.91 crore, Hand Tools and machines export was Rs. 231.45 crore, export of Cycle& Cycle Parts Rs. 1283.13 crore, Engineering Goods exports was Rs. 877.24 crore, and exports of Yarn & Textiles was Rs. 6519.8 crore. The main items of export from the State are Yarn & Textiles, Readymade Garments and Hosiery, Sports Goods, Engineering Goods, Cycle& Cycle Parts, Hand Tools and Drugs etc. Ludhiana, Jalandhar and Amritsar account for around 90 per cent of the total exports of Punjab (Statistical Abstract of Punjab, 2010).

The performance of export from industries has improved in the last few years. These were Rs. 15972.48 crore exports from Punjab during 2009-10 and Rs. 17,429.76 crore exports during the year 2010-11. The exports have increased to the tune of Rs. 21,301.55 crore during the year 2011-12. It further increased to the export of industrial goods worth Rs. 24,000 crore from the state during 2012-13. During the year 2011-12, the number of large and medium scale industrial units was 450 with a fixed investment of Rs 45000 crore, which provided employment to 2.50 lakh persons with a turnover of Rs. 95000 crore. During the year 2012-2013, these units have amplified to 475 with a fixed investment of Rs.50000 crore, which will generate employment to 2.70 lakh persons with a turnover of Rs. 105000 crore. During the year 2011-12, there were 170000 small scale industrial units with an investment of Rs. 9000 crore which provided employment to 10.40 lakh persons with a turnover of Rs. 60000 crore. During the year 2012-13, this number has expanded to 172000, with a fixed investment of Rs. 9400 crore, which will generate employment to 10.60 lakh persons, with a production value of Rs. 64000 crore (Economic Survey of Punjab, 2013-14).

Major industries of Punjab are:

- Hosiery/Ready-Made garments
- Yarn and Textiles
- Cycle and Cycle Parts
- Sports Goods

- Electronic Goods
- Auto Parts
- Hand Tool/Machine Tools
- Chemical/Pharmaceutical
- Food products
- Leather/Rubber Goods.

Industrial Clusters of Punjab

- Ludhiana
- Amritsar
- Jalandhar
- Patiala
- Phagwara
- Batala
- Goraya
- Mandi Gobindgarh
- Mohali
- Dera Bassi
- Chanalon
- Rajpura
- Goindwal

Globalization affects the growth in exports. The entire liberalization process faces numerous constraints. Foreign investors are still tentative in committing funds for capital-intensive projects. The Indian/Punjab brands are still not very popular abroad and are thus hampering exports. The process of globalization has started in India. Punjab economy has also witnessed the impact of various economic policies.

The present study is an attempt towards filling some gaps in the available Literature. Most of the studies mentioned above have covered the period up to the end of 2008. The present study will cover the period of two decades 1990s and 2000s.

1.2 OBJECTIVES

1. To analyze the growth of Punjab economy in general and exports from Punjab in specific.
2. To study the export performance of specially Yarn and Textiles, Hosiery and Ready Made Garments, Bicycle and Bicycle parts, Leather Products, Sports Goods and Hand Tools industries.
3. To find out trends in exports from Punjab since 1990 and causes of various trends.
4. To generate forecasts of exports of industrial goods from Punjab up to 2022.
5. To pin point the shortcomings and bad effects of various economic policies on Punjab's exports and to suggest remedial measures.

1.3 RESEARCH METHODOLOGY

This study aims at, analyzing the growth of exports in Punjab since 1990 and impact of various policies on the selected industries of the state of Punjab. For this purpose, five major industries have been selected, whose exports are substantial such as Yarn and Textile Industry/Ready Made Garments/ Hosiery from Ludhiana and Amritsar, Leather Industry, Sports Industry, and Hand and Tools Industry from Jalandhar, Bicycle and Bicycle Parts from Ludhiana.

To find out the performance of these selected industries, five export houses from each industry were be selected, on the basis of their importance in the industry.

Primary data was be generated by a structured interview to elicit information on various economic policies and their impact on the exports from Punjab.

The secondary data was be obtained from the following sources:

1. CIIC- Confederation of Indian Industry, Chandigarh/New Delhi.
2. Export Promotion Council, State of Punjab, Chandigarh.
3. Various Statistical Abstracts of Government of India and Punjab.
4. Punjab National Bank, Ludhiana
5. Punjab State Industrial Corporation, Chandigarh.

6. Indian Institute of Foreign Trade, New Delhi.
7. Indian Council of World Affairs (ICWA), New Delhi.
8. D.G.C.I & S, Calcutta.
9. Government of India,- Ministry of Commerce, New Delhi.
10. Government of India, Economic Survey (various issues) Ministry of Finance, New Delhi.
11. Annual Reports (various issue) Ministry of Commerce and Industry, New Delhi.
12. Government of Punjab, Economic Survey (various issues), Chandigarh.
13. Reserve Bank of India
14. Directorate of Industries of Punjab, Chandigarh.
15. Engineering Export Promotion Council, India.
16. Sports Goods Export Promotion Council, India
17. Council of Leather Exports, India.
18. Apparel Export Promotion Council, India.
19. Cotton Textile Export Promotion Council, India
20. Synthetic & Rayon Textile Export Promotion Council, India
21. Wool & Woolens Export Promotion, India
22. State Bank of India, Special Commercial Branch, Jalandhar
23. State Bank of India Zonal Office, Ludhiana

Projections of exports from Punjab have been made on the basis of its actual exports since 1990. These projections have been made with the help of Box-Jenkins' ARIMA (Auto Regressive Integrated Moving Average) model.

$$ARIMA(1,1,1)$$

$$(1-\phi B)(1-B)X_t = (1+\theta B)Z_t$$

$$(1-\phi B - B + \phi B^2)X_t = (1+\theta B)Z_t$$

$$(1-B-\phi B + \phi B^2)X_t = (1+\theta B)Z_t$$

$$X_t - X_{t-1} - \phi X_{t-1} + \phi X_{t-2} = Z_t + \theta Z_{t-1}$$

$$\Rightarrow X_t = X_{t-1} + \phi X_{t-1} - \phi X_{t-2} + Z_t + \theta Z_{t-1}$$

Projections have been made on following assumptions.

1. Relative price structure remains the same.
2. The growth rate of income assumed to be constant.
3. Punjab export prices remain either competitive or favourable to world export prices.

Time series analysis was be used for calculating the different trends.

Time Series Modeling Using ARIMA Models

These are special type of regression model where dependent variable is considered to be stationary and independent variable is lags of dependent variable and lags of errors. An ARIMA process is a combination of an Auto regressive and a Moving Average Process. Box and Jenkins (1976) first introduced ARIMA models. A time series can follow an ARIMA process only when it is stationary. A time series is said to be stationary only when it exhibits mean reversion around a constant long run mean, has a finite variance and decreasing correlogram as lag length increases. Stationary is important because if the series is non-stationary then all the typical results of the classical regression analysis are not valid.

Autoregressive Model

An autoregressive model of order p is represented as :

$$Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + ...\phi_p Y_{t-p} + u_t \qquad \text{..... (1)}$$

Where, $|\phi| < 1$ and u_t is a gaussian (white noise) error term. For the AR (p) model to be stationary is that the summation of the p autoregressive coefficients should be less than 1:

$$\sum_{i=1}^{p} \phi_i < 1 \qquad \text{.....(2)}$$

If the observations are generated by an AR(p) process then the theoretical partial autocorrelations will be high and significant for up to p lags and zero for lags beyond p.

This rule is generally utilized to define which process the series is following and is incorporated in the ARIMA model.

1.3.1 Moving Average Model

A moving average model of order q can be written as

$$Y_t = u_t + \theta_1 u_{t-1} + \theta_2 u_{t-2} + ... + \theta_q u_{t-q} \quad \text{..... (3)}$$

Moving Average MA (q) process is an average of q stationary white noise process, hence it is always stationary as long as q has a finite value. A time series is said to be invertible if it can be represented bya finite order MA or convergent autoregressive process. Invertiblity is an important property for identifying the order of MA process using Autocorrelation and Partial Auto Correlation Function as in this case it is assumed that Y_t sequence is well approximated by auto regressive model. An MA(1) process can be inverted to an infinite order AR process with geometrically declining weights if the necessary condition $|\theta| < 1$ is met. The mean of the MA process will be clearly equal to zero as it is the mean of white noise terms. For a MA(q) model correlogram (ACF) is expected to have q spikes for k = 0 and then go down immediately. Auto covariance of a MA process is equal to zero.

ARMA Models

These models are combinations to two processes and usually represented by ARMA(p,q). The general form of ARMA(p,q) models is represented by :

$$Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + ... + \phi_p Y_{t-p} + u_t + \theta_1 u_{t-1} + \theta_2 u_{t-2} + ... + \theta_q u_{t-q} \quad \text{..... (4)}$$

The equation can be rewritten as :

$$Y_t = \sum_{i=1}^{p} \phi_i Y_{t-i} + u_t + \sum_{i=1}^{q} \theta_j u_{t-j} \quad \text{..... (5)}$$

For stationarity of ARMA process only AR part of the model need to be stationary as MA part by default is stationary.

Integrated processes and the ARIMA models

ARMA models can only be applied on a stationary time series. If a series is not stationary then stationarity need to be induced into it by differencing it such that differenced time series ΔY_t is represented by:

$$\Delta Y_t = Y_t - Y_{t-1} \quad \text{..... (6)}$$

Generally time series need to be difference atleast once to make them stationary. After differencing once the series hence obtained is said to integrated to order one and denoted by I(1). Hence a series which needs to be differenced d times to make it stationary and then follows ARMA(p,q) model then the series is said to be following ARIMA(p,d,q) process.

An important aspect of the study was be covered by making useful discussions with experts. In this process much of the relevant unpublished information was made available.

Model

This study is based on the following hypotheses for testing the causality and co-integration between GDP and export of selected items in Punjab (i) whether there is bi-directional causality between GDP growth and export of selected items in Punjab, (ii) whether there is unidirectional causality between the two variables, (iii) whether there is no causality between GDP and export of selected items in Punjab (iv) whether there exists a long run relationship between GDP and EXPORT in Punjab.

Model Specification

GDP=f(Export)
Where GDP = Gross Domestic Product of the State.
Export = Export of selected six industrial items

The relationship between GDP and EXPORT of selected six industrial items in Punjab is expressed with the help of following model:

$GDP_{t=} a+b_t \text{ Export}+u_t$ ….. (1)

The model is based on the assumption other variables then export remains constant.

GDP is Gross Domestic Product of the State, Export is the Export of selected six industrial items at a particular time period t respectively. While ut is the error term; a and b represent the slope and coefficient of regression. The coefficient of regression, b specify how a unit change in the independent variable (export) affects the dependent variable (gross domestic product). The error, ut, is incorporated in the equation to cater for other factors that may influence GDP. The validity or strength of the Ordinary Least Squares method depends on the accuracy of assumptions. In this study, the Gauss-Markov assumptions are used and they include; that the dependent and independent variables (GDP and EX) are linearly co-related, the estimators (a, b) are unbiased with an expected value of zero i.e., E (ut) = 0, which implies that on average the errors cancel out each other. The procedure involves specifying the dependent and independent variables; in this case, GDP is the dependent variable while EXPORT the independent variable. In addition, whereas the Ordinary Least squares regression analysis can establish the dependence of either GDP on EXPORT or not.

Step –I: Ordinary least square method:

Here it was assumed as the hypothesis that there is no relationship between export (EXPORT) and GDP. To confirm the hypothesis, primarily, the effect of exports on economic growth of Punjab and vice versa was studied by two simple regression equations:

EXi=a+b*GDPi ….. (2)

GDPi=a1+ b1*EXi ….. (3)

GDP = Gross domestic product.
EXPORT = Export of selected items from Punjab.
t= time subscript

R^2 measures the overall fit of regression line. R^2 is equal to one means the regression fit the data perfectly.

Unit Root Test: Augmented Dicky Fuller

The basic Dickey–Fuller (DF) test (Dickey and Fuller, 1979, 1981) is to examine

whether $\rho<1$ in equation (4.3), which can, after subtracting *y* from both sides, be written as:

$$y_t = \rho y_{t-1} + \varepsilon_t$$

$$\Rightarrow y_t - y_{t-1} = \rho y_{t-1} - y_{t-1} + \varepsilon_t$$

$$\Rightarrow \Delta y_t = \delta y_{t-1} + \varepsilon_t$$

$$\Rightarrow \Delta y_t = (1-\rho) y_{t-1} + \varepsilon_t$$

$$\Delta y_t = c + \gamma T + \delta y_{t-1} + \sum_{j=1}^{p} \rho_j \Delta y_{t-j} + \varepsilon_t$$

Null Hypothesis

Ho: The process has a Unit Root

Cointegration Test:

Having established the time series properties of the data, the test for presence of long-run relationship between the variables using the Johansen and Juselius (1992) LR statistic for cointegration was conducted. The crucial approach which is used in this study to test cointegration is called the Johansen cointegration approach. The Johanson approach can determine the number of cointegrated vectors for any given number of non-stationary variables of the same order. The results reported in table (6) suggest that the null hypothesis of no cointegrating vectors can be rejected at the 1% level of significance. It can be seen from the Likelihood Ratio (L.R.) that we have a single co-integration equations. In other words, there exists one linear combination of the variables.

A statistical approach proposed by Clive W Granger (1969) to infer cause and effect relationship between two (or more time series is known as Granger causality. Granger Causality is based on the simple logic that effect can not precede cause.

It is important to note that the statement "x Granger causes y " does not imply that y is the effect or the result of x. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term.

Procedure of Traditional Granger Non-Causality Test

In its original form it is based on following bi-variate regression model (there are some other procedures used for causality testing such as Sim's Causality test, Hasiao Causality Test etc.)

$$y_t = \alpha_0 + \sum_{i=1}^{l} \alpha_i y_{t-i} + \sum_{j=1}^{l} \beta_j x_{t-j} + \varepsilon_t$$

$$x_t = \omega + \sum_{i=1}^{l} \gamma_i x_{t-i} + \sum_{j=1}^{l} \theta_j y_{t-j} + \varepsilon_t$$

If all the coefficients of x in first regression equation of y, i.e. β_i for $i = 1.....l$ are significant that the null hypothesis that x does not cause y. However, the significance of the coefficient cannot be evaluated based on usual t-statistic. For this purpose the following procedure of testing the nested models is used.

i. Estimate the model without including lagged values of variable x. Suppose the R^2 from this estimate is $R^2_{1.}$
ii. Now estimate the model including lagged values of variable x. Suppose the R^2 from this estimate is $R^2_{2.}$
iii. F-ratio for improvement in the model is worked out as follows:

$$F = \frac{\left(R^2{}_2 - R^2_1\right)/k^*}{(1-R^2{}_2)/(n-k)}$$

Where k^* are the number of lag orders l of variable x, k is the total number of the parameters estimated and n is the number of observations. The null hypothesis of non-

causality is rejected if F statistic is greater than its critical value at k^* and (n-k) degree of freedom. Econometric software packages such as Eviews routinely test Granger causality. Similarly from the second equation above, we can test the null hypothesis that 'y does not cause x'. If only one of the two variables causes the second variable but the second variable does not cause the first variable it is called one-way causality. If both the variables cause each other it is called the feedback causality.

1.4 SCHEME OF CHAPTERISATION

The study contained six chapters.

Chapter-1 The first chapter is devoted to the introduction to the subject.

Chapter-2 Focused at review of literature.

Chapter-3 Presents industrial development of Punjab and its exports.

Chapter-4 Focused at the performance of selected export industries of Punjab.

Chapter-5 Includes the forecast and trends in exports from Punjab since 1990, causes of various trends.

Chapte-6 The last chapter gives a summary of major findings and policy suggestions of the study.

CHAPTER – 2

REVIEW OF LITERATURE

A few studies have been undertaken to analyze India/Punjab export performance.

2.1 PRE LIBERALIZATION PHASE

Singh Manmohan (1960) analyzed India's export trends in the 1950's, when its exports constituted mainly of traditional commodities.

Nayyar (1970) analyzed India's export performance and policies for 1960's and had also included a few years of 1970s.

Bhagwati and Srinivasan (1970) investigated a wider area of trade regime, that too for 1960s.

Nambiar (1979) Exports had contributed only 2per cent to employment generation in India during 1963-64 and 1973-74. During this period there were no structural changes in the overall exports of the economy.

Ahluwalia (1988) reported that Industrial growth had not been as fast as was estimated. After a promising early period in the fifties and early sixties, from 1964-65 to 1975-76 industrial growth sluggish down noticeably. The industrial production index demonstrated a growth rate of only 4 per cent per year and value added in industry grew at 3.5 percent per year. There was proof of a steady acceleration after the mid seventies, through with substantial year-to-year fluctuations. In the period from 1981-82 to 1986-87, the industrial production index (base year 1980-81=100) depicts an average growth rate of around 7 per cent per year while value added growth is about 6 per cent. There was absolutely an improvement on past performance, but it still falls short of what was required at that time to take the economy away from the current 5 per cent growth of GDP.

Sahoo and Rath (1990) pointed out that there was an improvement in the exports of Indian capital goods after 1985. Two noticeable events were took place during 1985-87.

One was the announcement of the export-import policy 1985-1988. The other event was the drought of 1987-88, which, due to depressed domestic demand, might had improved the relative profitability of exports vis-a-vis domestic market. An interesting fact was observed that India had been exporting capital goods to the developed countries during that era.

2.2 LIBERALIZATION PHASE

Sarkar (1995) examined that there was a significant increase in exports. There was a real depreciation of the rupee vis-a-vis the SDR due to which, prices of Indian exports had fallen in terms of prices in the major industrial countries and prices of imports from these countries rise in terms of prices in India.

Sharma (1996) suggested that was a huge potential for exports. Policies played important role. For incisive new markets and sustaining the level of exports, greater attention had to be paid to the aspects of grading quality control, packaging, etc. as per the specifications/requirements of the importing countries.

Aggrawal (2001) reveled that exports of textile and garment had accounted for about 25 per cent of India's total commodity exports and 40 per cent of its manufactured product exports. During the year 1999-2000 the revenue generated by total exports was $ 38 billion of which share of textile and garments were $10 billion. Textile and garment sector were highly labour intensive sector and was a major source of employment generation.

Tendulakar (2000) had explained that by pacing the economic performance of India in respect of export earnings and economic development during 1980 to 1996 in the Asian perspective that includes the speedily growing economies of East and South East Asia such as South Korea, Taiwan, Thailand, Indonesia, Malaysia and China which started around more or less the similar level of per capita GDP as India in the 1950s but enjoyed much higher living standards than those in India. This was in spite of the fact that India had a headfirst start in industrialization well ahead of those nations in the 1950s.

DeLong (2001) revealed the result of first wave of economic improvement was an economic boom. Real GDP growth averaged 5.6 per cent per year over the Rajiv Gandhi administration, while real rupee exports expand at 15 per cent per year. The nation's net capital import bill increased to 3 per cent of GDP by the end of the 1980s. This growing foreign indebtedness more than a quarter of exports was going to pay international debit service by the end of the 1980s, for the exchange crisis of 1991.

Subramanian and Rodrik (2001) The turnaround in Indian exports during 1996-97 was primarily led by a decline in the growth rate of our export volume. The analysis clearly brings out the nature of demand-side factors, as opposed to the supply-side bottlenecks, which cannot be eliminated in a short time. However, the removal of supply bottlenecks is necessary to maintain a high export growth in a sustained way.

Banik (2001) examined the demand and supply factors effecting exports of Indian economy. There was a turnaround in Indian exports during a decline in the 1996-97 was primarily growth rate of our analysis in the led by export volume. There was a decline in the growth rate of export volume due to a decline in potential demand. However, actual demand was definitely constrained by a sharp decline in India's competitiveness due to nominal depreciation in many south-east Asian countries. The imposition of various forms of non-tariff barriers by developed countries 97 also led to a sharp drop during 1996- in the demand of Indian exportables. The removal of supply bottlenecks was necessary to maintain a high export growth in a sustained way.

Agrawal (2001) India's garment and textile exports were likely to face fresh challenges with the phasing out of the Multi-Fibre Arrangement by 2005, as well as several regional trade treaties, such as NAFTA. Strong concerted policy action is needed, following up on the abolition of small-scale industry reservation for the garment sector, to enable it to grow rapidly and provide foreign exchange and employment in the Indian economy.

Williamson, Zagha (2002) An alternate zone where change had been uniquely slow includes the conversion scale of the rupee and the liberalization of capital streams. After a sharp downgrading in July 1991 soon after it came to power, the new Government

advertised a coasting conversion scale administration in March 1992. At first, in any case, for one year, to alleviate the effect of the further assessment, 40 every penny of fare receipts were changed over at the old authority rate to back the import of some significant products, prominently sustenance, medications, and oil.

Rodrik and Subramanian (2004) examined that export developed at a slower pace in the 1980s than in the 1970s. Until 1991, India's arrangement producers erected inefficient industries under state guidance, riddled the private sector with amazingly cumbersome and detailed regulations, and suffocated private economic activity with controls and bureaucratic impediments. At that point in 1991, the enormous achievement happened. Spurred by a balance of payments crisis, Indian policy makers turned to technocrats such as Manmohan Singh, who immediately started the procedure of changing the economy. Exchange boundaries were sliced, outside speculation was respected, the permit raj was disassembled, and privatization started.

Rashmi (2006) emphasized that FDI may prompt to export diversification in the host nation if it positively influences the export intensity of industries that have low share in world exports. By implication FDI may empower export diversification through overflow impact that is the presence of FDI in an industry may increase the export intensity of nation's firms. The results for the Indian economy in the post-liberalization period had revealed that the FDI from US had directed to diversification of India's exports, both directly and indirectly. However, Japanese FDI has had no major impact on India's exports.

Kohli (2006) stated that recent acceleration of economic growth in India was more a capacity of the ace business tilt of the Indian state and less a consequence of the post 1991 monetary liberalization. Quick economic growth is important for poor India. It is also the case that India's development approach from the Nehru period was much in need of change. However, none of this implies, or ought not to imply, that any new growth strategy that produces these outcomes is beyond critical scrutiny. India's success at growth acceleration is to be admired. However, the current growth experiment has to be kept in proper perspective. India's economic development has not quickened significantly. What total change is noticeable predate before the changing changes by an

entire decade and modern development in the post-change period did not get. Also, the issues postured by India's present pro-business model of action of improvement incorporate disturbing implication for the nature of India's democracy.

Nilanjan Banik (2007) explained that India's share in world merchandise exports had increased from 0.4 per cent in 1981 to 0.5 per cent in 1991 and further to 0.91 per cent in 2006. There had been an increase in both the volume and the value had increased by 20.4 per cent.

Maertens and Basu (2007) point out that according to World Bank figures exports, as percentage rate of GDP, crossed 10 per cent for the first time in 1992 and in 2005 over 19 per cent. With the increase in foreign exchange balance and certainty of accomplishment in the product and pharmaceuticals part, Indian organizations had gone on a spree of purchasing global companies, a movement inconceivable ten years back. While the economic reforms of 1991-93 lie behind the international success of the nations.

Bhardhwaj and Gupta (2007) found that **u**nder the impact of lIberalization, the rate of growth of COR has declined, which was a good sign, foreign demand and single factor productivities both labour and capital had registered an increase in rate of growth but the growth rate for the degree of mechanization i.e. capital intensity had depicted a decline. It is anticipated that there would appear fall in factor productivities in next decade so government should intervene and adopt corrective measures to safeguard the interests of this highly promising industry of Punjab by providing help to the producers for technological upgradation as well as by maintaining the stock of essential raw materials at its own level to provide it to the producers as per their needs. Efforts should also be made for the simplification of the procedure for getting finance. Proper care and further development of sports goods complexes should be done. Financing of various training programmes for entrepreneurs and workers, provision of regular power supply to the production units and various incentives to the firms in form of subsidies and tax exemptions are also desirable on the part of government.

Veeramani (2007) In sum, India's exports during the growing faster than the rate of post-reform period had been growing faster than the rate of world exports. This was in contrast to the pattern observed for the pre reform period, particularly during 1950-80. The outcome was that growth of world demand was the most determining factor of India's merchandise export growth for both pre and post reform periods.

Pandey (2008) stated India's economic reforms of 1991 were supposed to present a package of better incentives for export promotion. Essentially the WTO Arrangements of 1995 was aimed at to simplify the world trade and rectify the prevailing trade obstacles between the countries. The genuine situation is something else, India's GDP, its components and export had diminished regarding every annum development after the economic reform of 1991, again it had declined after 1995 when WTO arrangements were introduced. In perspective of the realities that Indian exports and GDP in terms per annum growth has declined during the period 1991-92 to 1994-95 and during the period 1995-96 to 2004-05, there is an earnest need to reconsider about Indian export policies in order to augment the growth of Indian exports in future.

Reddy, Joseph (2009) explained the impact of horizontal as well as backward spillovers from the presence of foreign firms on the export performance of the domestic firms in Indian manufacturing industry during 1993-2008. Study revealed that increased competition in the domestic market in post liberalization period forced the domestic firms to look for exports. It had been observed that the export intensities of domestic firms were significantly higher in chemical industry sector. Another major observation was that there was a fall in exports of the food products, textiles, chemicals, basic machinery, electrical and electronic sectors.

Bhandari (2010) analyzed the performance of Indian leather industry during the period of economic slowdown and pointed out that there was a decline in exports in year 2009. Study also revealed that not merely that, this industry had undergone a dramatic transformation from a mere exporter of raw materials such as tanned hides and skins in the 1960s to that of value added finished products from the 1970s. Policy initiatives taken by the Government of India (GOI) since 1973 had been quite instrumental to such a transformation. The most important production centres are spread over selected areas

in a few states, e.g., selected places in Tamil Nadu, Kolkata in West Bengal, Kanpur and Agra in Uttar Pradesh, Jalandhar in Punjab and Delhi. And the main export market for Indian leather goods is Germany, with an oftake of about 25 per cent of India's household production, followed by the USA, the UK, France and Italy. The main export items are leather handbags, footwear and leather garments. European Union and USA are the major markets for leather exports. The study also revealed that leather industry is one of the most promising industry in India with enormous potential for exports.

Sasikumar and Abraham (2011) pointed that these measures of liberalization and rationalization of the sector facilitated it to develop its export performance. While the total exports had amplified from US dollars 497 million to US dollars during the period 1970 to 1985, growing at the annual rate of 9.7 percent, after the coming of the textile policy. In 1985 the export grew at 16.2 percent during 1985-95 to reach US dollars 8482 million in 1995. Subsequently, the advent of the ATC in 1995 the growth rate of exports sluggished down to 7.3 percent per annum among 1995 and 2007 and had reached 19559 million US dollars in 2007. The development rate of apparel items had been higher than material yarns all through the period. Empirical analysis investigated the view that export performance of the Indian firms in T&C was by exploiting the labor factor to gain access to the international market. Further, the utilization of this intends to perform better in the international market was aggravated in the period after the implementation of the ATC. On the other hand, capital and technology based factors did not have any impact on the export performance of Indian firms in international markets.

2.3 SPECIFIC TO INDUSTRIES

Studies related to Punjab Economy in specific.

Singh, Sukhpal (1990) The Indian bicycle industry which is more than 50 years old had experienced a number of changes in structure, organization and development in the last three decades, particularly after the mid 1970s when various factors resulted in a new demand for bicycles in developed countries. The 1980s marked a major shift in government policy towards the industry. Various new steps were taken under the policy

of liberalization and modernization and the industry was affirmed a thrust area for export promotion. The analysis of the growth, production structure and market revealed that by the late 1950s the bicycle industry had managed to take roots. Production of bicycles grew rapidly during 1950s followed by a slow growth in the 1960s. The dominance of the integrated, foreign collaboration based metropolitan units declined by the late 1960s. The impact of policies of liberalisation, modernisation and export promotion was reflected in the changes in production structure of the industry after the first half of 1980s. At that time though some advance in bicycle technology had been attempted by the government-sponsored R and D institutions, still, Indian bicycle industry is far behind the international developments in bicycle technology.

Brar (1995) observed that the growth and performance of exports depended upon its competitiveness. The domestic foreign trade policy is the crucial determinant for export performance. So it necessitated making the export promotion measures very selective and commodity specific. Thus the study brought out that there was a continuous need of identification of the growing markets and commodities in order to march with time.

Kapur (1996) found that bicycle industry witnessed a series of impediments in exports like infrastructure, delay in expatriation of export proceeds, payment of countervailing duties for imports, exchange control regulations, advance license scheme, higher rate of interest against exports and operational hurdles at sea port.

Lakhwinder and Sukhpal (2002) augmented that Punjab economy was facing an economic crisis of unparalleled scale. The rate of growth of state domestic product had declined in the 1990s and as a consequence of it, the per capita income had gone down. The top position of Punjab in comparison to faster growing states like Maharashtra in terms of per capita income had been relegated to a secondary position. They further predicted that if the economic crisis of Punjab economy is allowed to precipitate, then shortly other, fast-growing states like Gujarat will also overtake it.

Sidhu and Kumar (2003) tried to locate the relative position of the sports goods industry in the small scale industrial sector of Punjab. The growth of small scale industry has been defined in terms of the variables Capital-Intensity, Partial

Productivity of Labor, Partial Productivity of Capital and Captial - Output Ratio. Compound Annual Growth Rates have been worked out to record the changes in growth during the pre - liberalization as well as the post - liberalization period. Sports goods industry, when juxtaposed with other small scale industries of Punjab, was found improving its position during the liberalization period, in terms of Partial Productivity of Labour, Partial Productivity of Capital and Capital-Output Ratio as compared to the pre-liberalization period. Unfortunately, new policies remained unable to push up the relative position of sports goods industry in terms of mechanization.

Lakhwinder (2006) has examined the industrial development practice of Punjab economy during the period 1980-81 to 2001-2002, that was a decade earlier than and a decade after the beginning of economic reforms. The empirical evidence clearly demonstrated a downturn in industrial development in the post reform period contrast to that of the pre reform period. Factors that had contributed to the deceleration of industrial growth in Punjab were lesser investment with respect to Gross State Domestic Product ratio, lower plan expenses and lower quality of human capital and infrastructure. Recognized factors that have lead to the deceleration of industrial development in Punjab were making the state scarce in economic activities and lack of private corporate investment in Punjab both of domestic and foreign. Industrial sector of the Punjab economy clearly recorded deceleration in the post reform period. This was converse to what was estimated at the time of adopting the market oriented reforms in the nation.

Sidhu and Gulshan (2006) Punjab occupies a position of pride in the industrial map of India. Before independence, there were a few manufacturing centers in Punjab which were famous for industries, viz., Batala for foundries, Amritsar for woolen textile, Kartarpur for furniture and Ludhiana for hosiery but due to partition of the country, new industries like handtool, surgical instruments and sports goods appeared in Punjab (Lal, 1966). Now, Punjab leads in manufacture of machine and handtools, bicycle and bicycle parts, sewing machines, woolen & hosiery items and sports goods. As far as sports goods industry is concerned, it has witnessed a phenomenal growth over the past five decades and now occupies a place of prominence in Punjab's economy in view of

its massive potential for employment and growth. The sports goods industry of Punjab is a highly labour intensive industry providing employment to a large number of women as well as weaker sections of the society. “The only industry which appears to offer some prospects to Punjab is sports goods” (Chandra Mohan, 2002).

Sidhu et al (2007) suggested that the strength of the Taiwanese companies in technology, designs, and markets in these industries, such alliances can help transform the SSIs of Punjab into substantive exporters. The bicycle industry in Punjab had suffered from a slowdown in demand arising from customer preference in favour of motor-cycles and scooters as incomes have risen and from competition from cheap imports from China. There was a tremendous opportunity for moving up the value chain and attracting investments in high-end bicycle manufacture to reap downstream benefits for the bicycle component manufacturers of Punjab. The possibilities of collaboration between Indian bicycle manufacturers and companies from Taiwan should be encouraged, since Taiwan is the second largest exporter of bicycles after China. Another thing about the industry of Punjab, there was the period of terrorism and the period of the collapse of export markets in the former USSR, which affected the hosiery and woollen textiles industry in Punjab.

Bharadwaj and Kumar (2007) observed that liberalization had given a push to foreign demand, factor productivities and reduced COR which is conducive to the growth of the industry but unfortunately new policies remained unable to augment capital intensity in this highly labour· intensive industry. So far as future prospects of sports goods industry are concerned, the industry is expected to experience slight uplift in the degree of mechanization, satisfactory growth of foreign demand with slow growing COR and declining factor productivities.

Gupta and Kumar (2008) acknowledged that measuring the performance of exports of leather industry by computing yearly and compound annual growth rates, making short-term forecasts and measurement of long term trends. Long term trends in exports were caught by fitting ten distinct functional structures and equation of best fit was chosen on the basis of yardsticks mentioned in the econometric literature. Forecasts of exports were prepared for the lead time of five years by utilizing Double Exponential

Smoothing. Econometric benchmarks were utilized to test reliability and adequacy of the fitted model.

Avtar and Gulshan (2009) explained that despite the introduction of liberal policies, the number of units, fixed capital investment, direct employment and production in electrical machinery and parts industry in Punjab had failed to show encouraging results. A gigantic decline in CAGR of the liberalization period was observed for number of units and employment. Decline was noticed in the growth of the other two variables—production and fixed capital. The industry was facing a tremendous amount of competition from domestic and international producers. Fiscal incentives provided by some neighboring states coupled with unfavorable and irresponsive approach of the state administration were forcing the industry to relocate their businesses.

Raghbir and Gautam (2009) The aim of the paper is to study the performance of the small-scale sector of Punjab. Small-Scale Industries (SSIs) are significantly contributing to the economy of Punjab. In the liberalized era, the SSI sector is facing stiff competition from domestic as well as foreign companies. The paper outlines the year-wise growth trends in SSIs in terms of the number of units, employment generation, fixed investment, production and exports. The paper also shows a comparison of the SSI sector with the total industrial sector of Punjab. The new SSI units registration trends and district-wise distribution of units have also been highlighted here. The paper concludes that the position of the SSI sector is not very encouraging in the state. The main government institutions in the state are in a bad shape and are facing closure. Therefore, it is necessary for the government to provide infrastructure and incentives for the survival and growth of the SSIs.

Gulshan (2010) elaborated that despite the problem of militancy in the pre-liberalization period; significant growth rate was observed in all the four variables namely numbers of units, employment, fixed investment and value of production. But the policies of the liberalized regime had not remained benign to the growth of the small scale rubber and plastic industry of the Punjab. While, significant growth was witnessed in number of units and direct employment during liberalization period. The

liberalization had promoted the use of capital intensive and labour saving techniques of production leading to very poor growth of employment.

Gulshan and Sanjeev (2010) revealed that in the year 2008-09, the forecasted figure of exports was 11228.36 Rs. crore expected to rise to Rs. crore 12567.87 in 2011-12 and to Rs. crore 14032.62 in 2015-16 and finally expected to be Rs. crore 15448.53 by the year 2019-20. As far as compound annual growth rate (CAGR) is concerned, it is expected to be just 2.73. As this growth figure is much less than the growth of exports 1 for the previous decades.

Jain and Kiran (2012) emphasized that for all sectors the performance of Indian manufacturing is better than that of Punjab Manufacturing in Post-TRIPS period and the rate of growth of total factor productivity for Indian and Punjab Manufacturing is low. Seven sectors for all India Manufacturing and eight sectors for Punjab Manufacturing showed negative Total Factor Productivity.

SUMMARY

The various studies had conducted on India/Punjab industrial export performance at national as well as State levels. These industries were playing very important role in terms of exports, employment, output, profitability and scope of development. Before the liberalization period the industrial exports was not able to achieve economies of scale, employment level etc. Various studies stated that after the liberalization period, there were huge increments in exports of Punjab as well as India at large scale due to up gradation of technology, increasing economies of scale. Another important factor that played important role was education which further leads to skilled labour and investment by MNC's. To sum up, growth of industrial exports leads to economic development of nations as well as states.

CHAPTER – 3

EXPORTS OF PUNJAB

This chapter shall dwell on the first objective of the study namely:

"To analyze the growth of Punjab economy in general and exports from Punjab in specific."

Before looking into the export performance, the first section shall describe the industrial performance and then, the exports from Punjab.

Punjab is the richest Indian state. In specific, Punjab is one of the most vibrant and dynamic states in the whole of India. Punjab, an Indo-Iranian word, is a combination of 'Punj' meaning five and'Aab' meaning water i.e. it is "Land of Five Rivers" situated in the northwest of the country. Punjab stands 2nd on the basis of various socio economic factors viz. macro economy, investment, environment, infrastructure, and agriculture. Punjab has been ranked 1st in agriculture, infrastructure, and consumer markets, 5th in macro economy, 7th in primary health services and 10th in primary education and industrial investments. The state has been ranked 5th in terms of size, 11th in legal system, 12th in overall economic freedom and 18th in labour regulation. Among the 15 larger states of India, Punjab stands 2nd in overall competitiveness ranking of the states. The state has been ranked 1st in terms of infrastructure, 3rd in terms of human resources and business efficiency, 5th in terms of its economic strength and 6th in governance quality. (Economic survey of Punjab, 2011-12)

Being the neighbor of India's capital Delhi, it has a high growth of economy for years. This north Indian state has extremely prosperous neighboring states such as Haryana, Jammu & Kashmir, national capital Delhi, Rajasthan and Himachal Pradesh and Pakistani states of Punjab, which has been creating numerous trade opportunities for the people from all walks of life. The people of this north Indian state have migrated to the every corner of the world generating business and employment for the people of the country. Punjab is highly developed as far as infrastructure is concerned. The high-end communication generates trades, business and employment opportunities for the

exporters, industrialists, importers, distributors and suppliers etc. This state also has high number of manufacturing industries. Punjab is one of the most industrialized states in India. At the time of independence, Punjab had only a small number of industrial units primarily related to processing food grains, cotton ginning and brick kilns. Most of the manufactured items of even regular use came from outside Punjab. During the post-independence period, industrial progress in Punjab took place in phases. Thus, in the fifties, the cycle parts and hosiery industries took their roots in Punjab, while in the sixties, with the advent of the green revolution, agriculture related industries like farm machinery manufacturing came up. The main concentration in the seventies was on industries like auto-parts and electronic items and during the eighties on resource based industries like food processing, vanspati, edible and non-edible oils and sugar in a big way. Diversification of industry in progress, with the process of liberalization and economic reforms, while many of the established processing units, both in the small and medium and large sectors also, came under pressure. The industrial sector in the state is in the throes of a very important phase of transition with severe challenges and several new opportunities. In Punjab industries do play an important role in economic development. Besides classifying the industries of Punjab as rural, cottage, medium, and major industries, the department of industries, Punjab has classified medium and large scale industries into 15 groups on the basis of raw material used and the origin and nature of finished goods produced. These groups are food products, beverages, cotton, textile, wool, silk, and synthetic fiber textile, leather and fur products, non metallic mineral products, basic metal and alloy industries, metal products and parts, electronic machinery, apparatus and parts, machine tool and parts, transport equipment and parts, and other industries. Besides these medium and major industrial units, a large number of small scale and tiny units are also engaged in the manufacturing of the same products. The bulk of the industrial workers are occupied in small scale industries that is made up of 160,000 units. Large and medium business units are four hundred in number. The state's assorted industries range from Steel Rolling, scientific instruments, agricultural goods, electrical goods, bicycles, garments, machine tools, textiles, sewing machines to manufacturing of sports goods. Over the past few years the industrial sector

has employed over a million workers. Punjab has positioned itself as a key point for operations of multinational companies in assortment of industries. In Punjab, services sector has performed considerably better and has come out to be the most important segment in contributing to its economic growth. During 2011, the Services sector noticed a remarkable growth of more than 9 per cent. Infrastructure is a fundamental sector for the expansion of the industry and economy. The state offers outstanding infrastructure and has been ranked first amongst the big states in terms of infrastructure. Punjab has also been declared as one of the best states in India in terms of rail, road and transport network. The state government is working towards the development of infrastructure to encourage industry, commerce and trade in the state. (Statistical Abstract of Punjab, Various Issues) Punjab is endowed with fertile land and a favorable climate for cultivation of large number of cereals, fruits and vegetables, oilseeds, pulses and maize etc. The State has basic raw materials, manpower as well as a vast consumer market, which are the essential prerequisites for the industrial production. The enormous potentials of agricultural resources accessible in Punjab can be better utilized by preserving and processing, as well as by using available technologies. (Government of Punjab, 2010)

Punjab economy includes various economic activities, many of which are also primary occupations. No country, state or region can formulate development on the basis of primary productive occupations alone, especially when such a region has a bulk and rapidly increasing population. To attain increasing income, higher standard of living, higher purchasing power, better opportunities for jobs and over all development, better and efficient use of natural and agricultural resources are important.

Punjab is predominantly an agricultural state. Punjab economy principally depends upon agriculture. Presently the agricultural production has not shown a significant increase; rather at times a decreasing tendency has been recorded. Agricultural production has reached almost a saturation point and ceased to be remunerative. Therefore, the need of the hour is to introduce diversification in agriculture and greater attention is required towards the development of industries in the state. Only then, Punjab will be able to maintain its prosperous and strong economy. In Punjab, small

scale industries do play their part but at the same time there exists a favorable industrial environment in Punjab for medium and large scale industries also.

Punjab State Industrial Development Corporation (PSIDC), a prime institution of the State Government for encouragement of large and medium industries, continued to play an energetic role[1]. The Corporation commissioned nine industrial projects with a capital outlay of Rs. 453.37 crores having the employment potential for 73,591 persons during 2011-2012. Besides this seven projects were taken up for construction with a capital outlay of Rs. 92.44 crores having the employment potential for 1042 persons during the same period. For the development of industrial structure in the state, Punjab Small Industries and Export Corporation has so far developed 50 industrial focal points including two growth centers one each at Bathinda and Pathankot and a mini growth centre at Tanda. Another 23 focal points have already been approved by the Government. A total number of 7281 plots have been developed by the corporation, out of which 6796 plots have been allotted till 3.3.2004. The state Government, with the assistance of Government of India is also setting up an Export Promotion Industrial Park spread over an area of 175 acres at Dhandari Kakan in district Ludhiana, with an approved out lay of Rs. 1430 lakhs. The park is expected to give a boost to exports from Punjab. The exports from the State were to the tune of Rs. 21301.55 crores in 2011-2012 as against Rs. 4014.96 crores in 2001-2002.

There were 586 medium and large scale units in 2012-2013 with a fixed investment of Rs. 17000 crores providing employment to 2.52 lakh persons with a turn over of Rs. 35600 crores. (Economic Survey, 2012-13)

Small scale units are the back bone of the industrial structure in the State. These units manufacture a variety of goods ranging from tiny needles to sophisticated electronic goods. The number of small scale working units increased from 1.99 lakh in 1999-2000 to 2.01 lakh in 2000-2001. The employment in this sector increased from 8.83 lakh persons in 1999-2000 to 8.97 lakh persons in 2000-2001. The fixed investment in these units rose from Rs. 3794 crores in 1999-2000 to Rs. 4250 crores in 2000-2001. The

[1] Govt. of Punjab, *Economic Survey 2000-2001*

number of such units were expected to increase to 2.03 lakh in 2001-2002 with a fixed investment of Rs. 4650 crores providing employment to 9.17 lakh persons with a turn over of Rs. 21500 crores. In 2009-10, the total number of small scale industry in Punjab was 162559 providing employment to 9.44 lakh persons with fixed capital of Rs. 5972.29 crore and production was Rs. 418996.80 crore. In 2012-13, the total number of small scale industry in Punjab was 194,000. During the year 2011-12, there were 170000 small scale industrial units with an investment of Rs. 9000 crore which provided employment to 10.40 lakh persons with a turnover of Rs. 60000 crore. During the year 2012-13, this number has increased to 172000, with a 144 fixed investment of Rs. 9400 crore, which will generate employment to 10.60 lakh persons, with a production value of Rs. 64000 crore. As per the ASI report 2010-11, number of factories in Punjab has amplified from 10262 in 2009-10 to 12770 in 2010-11showing an enhance of 24.44 per cent and Fixed Capital has increased to 3399231 lakh in 2010-11 from 2610606 in 2009-10 and the rate of increase is 30.21 per cent. The number of employees and net value added has amplified by 8.31 per cent and 38.30 per cent respectively in 2009-10. During the year 2012-13, this number has increased to 172000, with a fixed investment of Rs. 9400 crore, which will generate employment to 10.60 lakh persons, with a production value of Rs. 64000 crore. (Economic Survey, 2012-13)

The Punjab Financial Corporation (PFC) assists small, medium and large scale units in the formation of fixed assets. It provides medium and long term loans to entrepreneurs.

Industry groups – Besides classifying industries of Punjab as rural, cottage, medium and major industries, the department of industries, Punjab has classified medium and large industries of Punjab into 34 groups on the basis of raw material used and origin and the nature of finished goods produced. These groups are Food Products, Beverages, Cotton Textiles, Wool, Silk and Synthetic Fiber Textile, Paper and Paper Products, Leather, Leather and fur products, Rubber plastic etc., Chemical and Chemical Products, Non-Metallic Mineral Products, Basic Metal and Alloy Industries, Metal Products and parts, Electric Machinery, Apparatus and Parts, Machinery, Machine Tools and Parts, Transport equipment and Parts, Recycling, Electricity, Gas, Steam & Hot Water Supply and other industries. The Economic and Statistical Organization of

Punjab has formed three more groups –Jute, Hemp and Mestas Textile, Textile Products (Garments) and Wood and wooden products, Furniture and Fixtures.

Table 3.1 : District–wise Distribution and Types of Industries in Punjab

District	**Concentration of types of Agro-industries in Punjab**
Amritsar	Power Loom Weaving, Wood & Machine Screws, Radio & Transistors, Agricultural implements, Paints & Varnishes and Dyes, Electric fans, Pharmaceuticals, Printing machinery, Textiles, Chemicals, Soap, Acids.
Ferozpur	Cotton ginning and processing, flour mills, milkboard and agricultural implements
Bathinda	Cotton ginning and processing, flour mills
Fatehgarh Sahib	Steel re-rolling, Pump parts, Sewing machine parts, Truck body building
Gurdaspur	Agricultural implements, Conduit pipes, Machine tools, Soap & chemical products, C.I. castings, Brassware
Hoshiarpur	Rosin & Turpentine oil, Paints & Varnish, Sugar, Agricultural implements, Pressure cookers, Paper and Paper board
Jalandhar	Surgical instruments, sports goods, Hand tools, Automobile parts, Cocks & valves, Pipe fittings, Bus body building, Leather tanneries, Ball bearings, Publication, Switch & switch-gears and Rubber goods
Kapurthala	Agricultural implements, Pressure cookers, Fans, Wood & Machine screws, Electrical goods, Rice Mills, Rubber goods, Bolts & Nuts and Diesel engines.
Mansa	Agricultural implements, cotton spinning
Moga	Cotton yarn, rice bran oil, paper
Ludhiana	Bicycles & bicycle parts, Automobile parts, Hosiery goods, Sewing machine & parts, Home appliances, Machine tools, Readymade garments, Hosiery needles, Rubber goods, Label s (Metal & Cotton), Chemical goods, Oil engines, Agricultural implements, Electronic goods, Tractor parts, Cycle tyres/tubes, Plastic goods

Contd …..

District	Concentration of types of Agro-industries in Punjab
Patiala	Automobile parts, Sewing machine parts, Enamelled copper wire, Electrical goods, Bakery machinery, Cutting tools, Biscuits, shoes
Rupnagar	Agricultural implements, Pharmaceuticals, Tractors & Parts, Electronic components, Electrical components
Sangrur	Agricultural implements, Tractor parts, Cycle parts, Sewing machine parts, Milk products, Chilled Rolls
Nawanshahar	Light Commercial Vehicles, Pharmaceutical, Yarn, and Sugar
Muktsar	Cotton yarn, Rice Bran Oil, Paper

Source: Directorate of Industries, Punjab.

District-wise distribution and types of industries in Punjab has been discussed above. The main industrial districts in Punjab are Ludhiana, Jalandhar, Amritsar and Bathinda. Ludhiana district is known for textile and hosiery products, Jalandhar and Bathinda districts for food products, paper and machinery and textiles.

Besides these medium and major industrial units, a large number of small scale and tiny units are also engaged in the manufacture of the same products. All the industrial units have been mentioned but the study is restricted to only six items, namely Yarn and Textiles, Hosiery and Ready Made Garments, Bicycle and Bicycle parts, Leather Products, Sports Goods, and Hand Tools.

3.1 CONCENTRATION ON SIX SELECTED INDUSTRIES FROM PUNJAB

The focus shall be on these six items and three major cities of Punjab i.e. Jalandhar, Amritsar and Ludhiana.

Table 3.2 : Contribution of selected industries in total exports of Punjab (2012-2013)

Industry	Exports	%age Total Exports
Yarn & Textiles	3460	17.86
Readymade Garments & Hosiery	4275	22.07
Cycle & Cycle Parts	1579	8.15
Sports Goods	1024	5.28
Leather Goods	226	1.16
Hand Tools	255	1.31

Export of Rs. 10819 crore out of the total exports of Rs.19366 crores in 2012-2013 was from the selected industries which account for around 56 per cent of total exports.

(1) Yarn and Textiles

Punjab has many favourable conditions for the success of yarn textile industry in the state. Punjab is the largest producer of superior quality narma cotton and the third largest producer of cotton in general in the country. Therefore there is abundant availability of raw material in the state. Punjab has a favourable industrial environment for cotton textile industry. The major centre of cotton textile industry is Ludhiana city which has 10 spinning and weaving mills.

(2) Woolen Textile and Hosiery Industry:

It is also an important industry of Punjab. Punjab is the largest producer of woolens and hosiery products. Nearly half of such mills are located in Punjab. Punjab has also nearly half of the total spindles and looms engaged in woolen and hosiery manufacturing in the country. The woolen and hosiery industry of Punjab has large consuming markets.

Hosiery Industry- Hosiery manufacturing is an important industry in Punjab. Punjab is the largest producer of hosiery goods in the country. It is said that Maharaja Ranjit Singh started hosiery industry at Ludhiana with the help of Britishers and provided jobs

to the Kashmiri skilled laborers at Ludhiana. This industry is a part of woolen industry and 95% of the hosiery industry of the Punjab is concentrated at Ludhiana City. Woolen, cashmilon and other type of yarn produces in the state form the basis of this industry. The yarn is mostly produced in Ludhiana city. The cold winters of the region create a large market for hosiery goods. Being densely populated, Ludhiana city provides cheap and abundant labor. Ludhiana not only meets the requirements of hosiery goods in the region and the country but it is also the major exporter of hosiery to Russia and other countries. Most of the hosiery goods are manufactured in small scale units. There are four large industrial units at Ludhiana which manufacture hosiery goods only. Hosiery industry primarily produces Jerseys, Pullovers, Mufflers, Gloves, Socks and Stockings, caps etc. In 1994-95 Punjab produced 164.79 lakh jerseys and other hosiery goods where as the production was 124.72 lakh pieces in 1990-91. In the year 1998-1999 the production of Woolen Hosiery was 11,305 numbers and in the year 1999-2000 was 9,827 and in the year 2000-2001 it was 11443 numbers. The production of hosiery and garments in 2009-10 was 3480.53.

(3) Sports Industry

Punjab is the largest and most important producer of sports goods in the country. Punjab is also an important exporter of sports goods. The industry in Punjab became important after 1947 when most of skilled laborers migrated from Sialkot (Pakistan) and settled at Jalandhar. Therefore Jalandhar has become the chief centre for sports goods industry. Wood is sourced from Kashmir and high quality goods are produced. In 1994-95 Punjab produced sports goods worth Rs. 9, 68,657 thousands. There is a great demand for the goods produced in this industry in the country and abroad. There are 758 units registered with the district industries centre. Basti Nau, Basti Danish Mandan, Basti Sheikh and Bhargo Camp localities of Jalandhar are known important for the manufacture of sports goods. Entire range of sports goods is manufactured here. In the year 2012-13 the production of sports goods was worth Rs. 5,920.42 lakh and it gives direct employment to about 10,000 workers and indirect employment to 40,000 workers.

Table 3.3 : Production and Employment in Sports Industry of Punjab

(Production in Rs. lakh and workers in numbers)

Years	Production	Employment
1988-89	6105.32	850
1990-91	6282.40	8716
1991-92	6514.03	9108
1992-93	7268.20	9385
1993-94	9416.21	9317
1994-95	14929.56	6020
1995-96	15807.48	5780
1996-97	18316.30	5884
1998-99	20585.67	6018
1999-2000	3834.31	6243
2000-2001	21239.38	6553
2001-02	24002.97	8276
2002-03	26766.56	10000
2003-04	28970.55	10045
2004-05	30072.54	10067
2005-06	31174.54	10089
2006-07	34174.52	10089
2007-08	40088.00	10053
2008-09	44762.00	10905
2009-10	45500.00	11700
2010-11	45131.00	11302
2011-12	45315.50	11501
2012-13	45223.25	11402

Source : Govt. of Punjab, *Statistical Abstract of Punjab*, (various issues)

Table 3.3 describes the position of sports industry in Punjab. Table contains various years corresponding production and employment provided by the sports industry.

Table 3.4 : Correlation between production and employment of sports industry

		Production	Employment
Production	Pearson Correlation	1	0.705**
	Sig. (2-tailed)		0.000
	N	23	22
Employment	Pearson Correlation	0.705**	1
	Sig. (2-tailed)	0.000	–
	N	22	22

**. Correlation is significant at the 0.01 level (2-tailed)

Table no. 3.4 showed that there were positive correlation among production and employment for sport goods industry that depicts both the variable were correlated with each others. If employment increased the production also increased and vice versa.

(4) Leather Industry

Leather industry of Punjab is very old. There are about 300 units in Punjab which manufacturer rubber, plastic and leather goods. 36 small, medium or large factories produce leather and leather goods. Of these 22 are located in Jalandhar alone. Out of 4 medium and large leather factories of the state, 2 are in Jalandhar, one at Goindwal Sahib and one at village Mubarakpur in Patiala District.

(5) Machine and Hand Tools

This industry is both in small scale and medium and large scale sector. There are 1482 units in the sate which manufacture various types of tools. There are 8 large and medium scale tools making industries in Punjab. They are at: Hosiharpur, Jalandhar, Rajpura, Patiala, Malerkotla, Sahnewal (Ludhiana), Ludhiana and Mohali. The industry provides employment to about 15 thousand people. In 1995-96 Punjab exported machine and hand tools of value Rs. 15752.31 lakh. The production of Hand Tools in the year 1995-96 was 30,011.03 lakh and it provided employment to 1,0173 workers and in the year 2000-2001 the production was 47,770.81 lakh it provided employment to 11,980 of workers in 2009-10, the production of hand tools industry in Punjab was 1,42,300 lakh and it provided employment to 18900 workers.

Table 3.5 : Production and Employment in Hand Tools Industry of Punjab

(Production in Rs. Lakh and workers in numbers)

Year	Hand Tools	
	Production	Employment
1988-89	5086.66	9048
1990-91	5934.06	9342
1991-92	6350.71	9716
1992-93	9751.65	10141
1993-94	21689.66	11291
1994-95	31606.27	10173
1995-96	30011.03	10425
1996-97	62708.36	12741
1998-99	24917.60	16865
1999-2000	45964.70	11638
2000-2001	47770.81	11980
2001-02	58430.00	14769
2002-03	63759.59	16164
2003-04	66424.39	16861
2004-05	67756.79	17209
2005-06	69089.19	17558
2006-07	77887.46	18058
2007-08	135225.00	19790
2008-09	140878.85	19534
2009-10	142300.00	18900
2010-11	141589.42	19217
2011-12	141944.71	19059
2012-13	142767.06	19138
2013-14	142355.88	19099

Source : Govt. of Punjab, *Statistical Abstract of Punjab*, (various issues)

Table 3.5 describes the position of hand tool industry in Punjab. Table contains various years corresponding production and employment provided by the hand tool industry.

Table 3.6 : Correlation between production and employment of hand tool industry

		Production	**Employment**
Production	Pearson Correlation	1	0.887**
	Sig. (2-tailed)	–	0.000
	N	24	24
Employment	Pearson Correlation	0.887**	1
	Sig. (2-tailed)	0.000	–
	N	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

Table no. 3.6 showed that there is a positive correlation among production and employment for hand tool industry that depicts both the variable are correlated with each others. Increase in product leads to increase in level of employment and vice versa.

6) Cycle and Cycle parts

It is an important industry of Punjab. Cycle and cycle parts is basically a small scale industry. Ludhiana is the chief industrial cluster for this industry. In 1947 there were only 25 units engaged in the production of cycle and cycle parts. The number went up to 3742 small scale units in 2009. Two thirds of the small scale industrial units and nine tenths of the large and medium scale units producing cycle and cycle parts are located in Ludhiana city complex alone. The famous Hero and Avon Cycle Industries are located in Ludhiana. The second major centre of this industry is Rajpura. Punjab is an important exporter of bicycles and parts.

Table 3.7 : Production and Employment of cycle and cycle parts

Year	Hand Tools	
	Production	Employment
1988-89	56630.56	33040
1990-91	58735.94	34876
1991-92	61734.53	34998
1992-93	82653.35	35789
1993-94	89653.88	37890
1994-95	90836.43	37327
1995-96	127463.35	38945
1996-97	207353.89	39645
1998-99	288536.90	44797
1999-2000	319746.73	45765
2000-2001	334735.77	45990
2001-02	347463.81	57015
2002-03	379353.32	57356
2003-04	415652.87	57932
2004-05	450652.67	57124
2005-06	484542.71	58281
2006-07	640809.90	57631
2007-08	753138.00	59736
2008-09	751980.00	58903
2009-10	770600.00	59250
2010-11	721637.92	62149
2011-12	814915.21	67804
2012-13	929737.45	72887
2013-14	872326.33	70346

Source : Govt. of Punjab, *Statistical Abstract of Punjab*, (various issues)

Table 3.7 shows the production and employment provided by cycle and cycle parts industry in Punjab from 1988-89 to 2013-14.

Table 3.8 : Correlation between production and employment of cycle and cycle parts industry

		Production	**Employment**
Production	Pearson Correlation	1	0.946**
	Sig. (2-tailed)	–	0.000
	N	24	24
Employment	Pearson Correlation	0.946**	1
	Sig. (2-tailed)	0.000	–
	N	24	24

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3.8 showed that there were positive correlation between production and employment for cycle and cycle parts industry in Punjab that depicts both the variable were correlated with each others. The value of correlation between production and employment was 0.946 which symbolize that there are highly positive correlation between both the variables. So, concluded that if employment increased, the production also increased and vice versa.

3.2 INDUSTRIAL CLUSTERS IN PUNJAB

Now the question arises why these Industries are important for Punjab and why Industrial concentrations in Punjab. Most of the industrial clusters have developed along the main rail and road route or at the nodal points of the major state highways. This development illustrates the great importance of fast and dependable (efficient) means of transportation in today's contracting world. Assembly of raw materials and the timely delivery of manufactured products to the consumers are very important factors for the promotion of industries. This function is performed by means of transportation. Following are three important clusters of Punjab.

Ludhiana Industrial Cluster- It is the largest industrial cluster of Punjab which extends like a star along the main roads from its centre for many kilometers. This cluster includes 147 of the 602 large and medium industries and a large number of small and tiny industrial units of the state. The cluster has the largest number of the basic metal industries, woolen and hosiery industries, cotton textile and synthetic textile industries and transport equipment and parts manufacture industries. Ludhiana accounts for more than 35 per cent of industrial output, 23 per cent of industrial units and 33 per cent of industrial work force of Punjab. Ludhiana is the Asia's largest center for bicycle manufacturing and fabricates more than 50 per cent of India's consumption. Ludhiana is the largest city of Punjab with a population of 3,498,739 in 2011. It has a nodal position on the trunk rail and road route of Punjab. It is connected by rail and road with all parts of the state and the country. Ludhiana has the largest number (about 5 lakh) of migrant laborers in Punjab.

Amritsar Industrial Cluster-It is the second largest industrial cluster of Punjab where about 10 per cent of the large and medium industries of the state are located in and around the city of Amritsar. A number of food products manufacturing, woolen, cotton and synthetic textiles, blankets and shawls making, paper and board manufacturing etc. are located in this cluster. Amritsar is the second largest city of Punjab with a population of 2490891 in 2011. Amritsar district is also the most populous district of Punjab. It is an important railway junction and many state highways converge at Amritsar.

Jalandhar Industrial Cluster- It is Punjab's third largest city and Doaba's chief centre. Though Jalandhar cluster has 18 large and medium industries but it has a large number of small industrial units. It is the chief centre (125 units) of leather and leather good industry. It is world famous for sports goods industry. It has a population of 21,81,753 (2011 census).

Table 3.9 : Contribution of selected districts total exports of Punjab (2009-2010)

District	Exports (In crores)	%age of total exports
Amritsar	2307	14.44
Jalandhar	2729	17.09
Ludhiana	9731	60.92

Table 3.9 explains the contribution of selected districts in total exports of Punjab (2009-2010). Rs.14767 crore of exports out of the exports of Rs.15972 crores in 2009-2010 was from the selected districts which account for 92% of total exports.

Exports of Punjab

Today, no society, state or country can be self-sufficient. In the present times when division of labor and specialization have become the hall marks of an economy, dependence on others has become important. Besides these economic reasons, uneven distribution of natural resources and rapidly increasing population make this dependence all the more important. As a result of uneven distribution of resources population, income, demand, production and aspirations and objectives exchange of goods has been in vogue since ancient times. This give and take or exchange of goods is called trade.

Exports are essential for a nation. It makes economy of the country healthy and strong by maintaining positive trade balances. Exports have become vital especially when the markets are becoming global. Almost all the nations of the world make an effort to develop exports because of the importance of exports to the concerned economy. Exports provide a foreign market, which provides opportunity to achieve economies of scale and growth, earn foreign exchange etc. The present liberalized economy of the country has given a boost to exports from India to almost every nation of the world. Now India is also a partner in international trade and business.

Table 3.10 : India's Export Performance

Period	Exports as Percent of GDP	Ratio of Exports to Imports (per cent)	Compound Annual Growth Rate	India's share in World Exports
1980-81 to 1990-91	5.58	65.09	16.14	0.51
1992-93 to 2000-01	9.31	86.07	16.31	0.60
2001-02 to 2012-13	4.82	70.37	18.69	1.6

Source: Government of India, *Economic Survey* (various Issues)

Table 3.10 reveals that foreign trade performance has been impressive in terms of ratio of exports to imports and ratio of exports to GDP during nineties as compared to eighties. But performance has been poor in terms of share of India's exports in world exports. The Country has not been able to achieve even one percent share in world exports. Exports have increased at slightly higher rate in nineties as compared to eighties.

To compare the relationship between three decades of study period, first decade was from 1980-81 to 1990-91, second decade was from 1992-93 to 2000-01 and third decade was from 2001-02 to 2012-13 were significant or not, t-test was applied (Table 3.11). At 2 tailed exports as percent of GDP was significant. Ratio of exports to imports was significant. In case compound annual growth rate India's share in world exports was significant.

Exports of Punjab also affect India's foreign trade. Punjab is an agriculture dominant state. It has surplus of agricultural produce. But Punjab lacks minerals and coal and petroleum. There is a scarcity of timber. Punjab has well developed small scale industries and has surplus of several small scale and other industrial and manufactured products such as bicycles, sewing machines, hosiery goods, leather goods, tools etc. Intensive and commercial agriculture has generated surplus income in Punjab and thousands of migrant and NRI Punjabi's send large amount of money back to their

Table 3.11 : T- Statistic for India's Exports performance

One-Sample Test							One-Sample Statistics		
	Test Value = 0								
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference				
					Lower	Upper	Mean	Std. Deviation	Std. Error Mean
Exports as Percent of GDP	4.735	2	0.042	6.57	0.6003	12.5397	6.57	2.40314	1.38746
Ratio of Exports to Imports (per cent)	11.72	2	0.007	73.84333	46.7346	100.9521	73.8433	10.91275	6.30048
Compound Annual Growth Rate	20.71	2	0.002	17.04667	13.505	20.5883	17.0467	1.4257	0.82313
India's share in World Exports	2.586	2	0.123	0.90333	-0.5996	2.4063	0.9033	0.60501	0.3493

homes in Punjab. This has resulted in higher purchasing power and there has developed demand for luxury and consumer goods in Punjab. Therefore, Punjab has a large flourishing trade. This trade of Punjab is internal or inter-state or international. In our study we consider only international i.e. goods which are exported to other countries from Punjab and contribution of Punjab state in India's foreign trade.

Punjab primarily exports woolen and cotton textiles, hosiery/readymade garments, gunny bags and cloth, tanned chrome leather and leather goods, rubber products, sewing machines and parts, electrical switch gears and electrical accessories, P.V.C cables, auto parts, bicycles and parts, sports goods, coffee, solvent oil and rice bran extraction machine and hand tools etc. In 1995-96 Punjab exported such articles worth Rs. 244156.92 lakh and in the year 2001-2002 this amount was 440790 lakh. Besides these Punjab also exports glass, cement, steel bars, girders, sheets and other form of iron and steel, artificial silk piece goods, machinery equipments, footwear and metal products. A large part of (about 94.5 per cent) of industrial exports of Punjab originated from its three major industrial districts; namely Ludhiana (51 per cent), Amritsar (18 per cent) and Jalandhar (21.7 per cent) in 1999-2000 and in the year 2001-2002 total exports from Jalandhar was Rs. 94764 Lakh, Amritsar Rs. 69512 Lakh and from Ludhiana Rs. 230364 Lakh. Total exports from Punjab in 2001-2002 was worth Rs. 440790 Lakh. From 2001-02 to 2011-12 the export as percent of GDP was 4.82. the per cent of ratio export to import was 70.37. Compound growth rate was 18.69. And India's share in world export was 1.6 per cent from 2001 to 2012. The export performance of industries has increased in the last few years. These were Rs. 15972.48 crore during 2009-10 and Rs. 17,429.76 crore during the year 2010-11. The exports have increased to the tune of Rs. 21,301.55 crore during the year 2011-12. It is further expected that industrial goods worth Rs. 24,000 crore would be exported from the state during 2012-13.

Table 3.12 : Growth of Exports in Punjab (at Current Prices)

Year	GDP(Rs Crore)	Exports(Rs Crore)	Percentage of Exports to GDP	Share of Punjab in India's Total Exports
1989-90	16980	647.65	3.8	3.9
1990-91	18882	769.20	4.1	4.2
1991-92	22300	900.81	4.0	5.0
1992-93	26275	1214.5	4.6	6.6
1993-94	30928	1815.5	6.0	8.2
1994-95	34095	2082.30	6.1	7.9
1995-96	38514	2564.6	6.6	8.1
1996-97	44163	3024.8	6.8	9.0
1997-98	48388	4204.8	8.7	12.0
1998-99	54414	3629.1	6.7	10.9
1999-00	62700	3676.4	5.9	10.0
2000-01	66049	4015	6.1	9.0
2001-02	70751	4408	6.2	10.1
2002-03	83795	7014	8.4	13.3
2003-04	90317	8933	9.9	14.0
2004-05	96839	7914	8.2	9.5
2005-06	108637	9656	8.9	9.4
2006-07	141338	11798	8.3	9.3
2007-08	157189	10710	6.8	6.6
2008-09	174039	13888	8.0	7.5
2009-10	197499	15972	8.1	8.9
2010-11	226867	17430	7.7	6.9
2011-12	259223	21302	8.2	7.0
2012-13	243045	19366	8.0	6.4

Source: Govt. of Punjab, *Statistical Abstract of Punjab* (various issues), Economic and Statistical Organisation, Punjab.

Table 3.12 shows that exports from Punjab increased from Rs. 647.65 crore in 1989-90 to Rs. 4408 crore in the year 2011-2012. Openness in economy is measured by ratio of exports to GDP, this ratio increased from 3.8 in 1989-90 to 8.0 in 2012-13. No doubt that due to liberalization Punjab's exports increased, but these constituted very minor share in total India's exports. There is no variation in the share from the year 1989-90 to 2011-12. Only in the year 1997-98 this share increased to 3.32 but again this share starts reduced and reached 2.12 per cent in the year 2001-02. After 2003-04, it reduced from 14 per cent to 7 per cent in 2011-12.

Figure 3.1 : Growth of Exports in Punjab

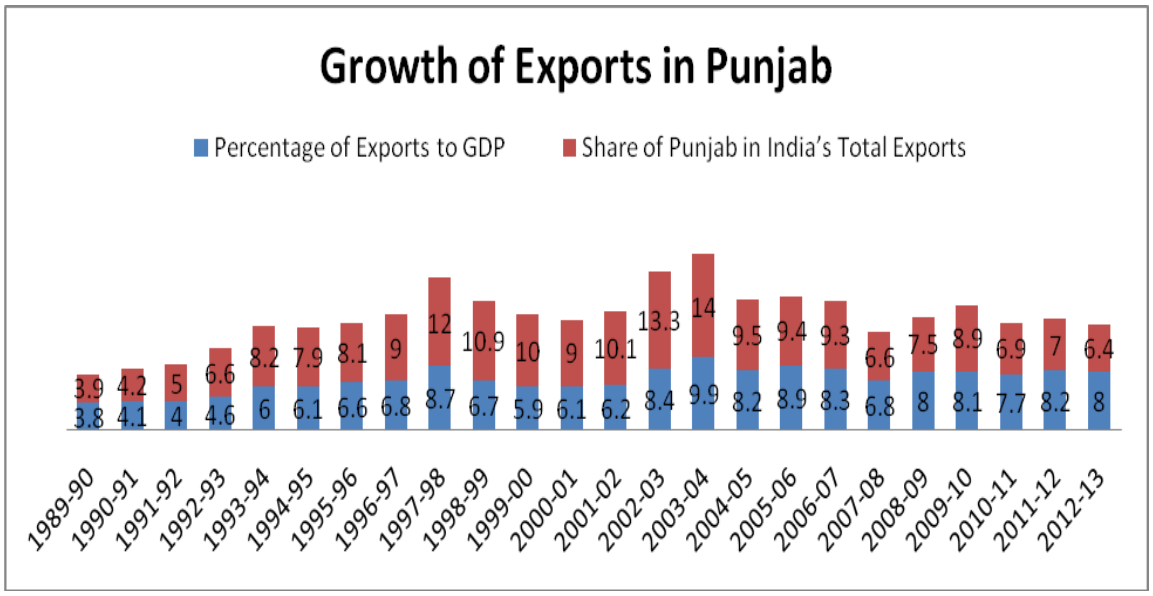


Table 3.13 : Direction of Punjab's Export of Selected items

Selected Items of Export	Market
Hosiery and Ready-made Garments	Mainly USSR, Arabian Countries, Hong Kong, UK, Italy, USA, France, Malaysia & Singapore
Sports Goods	USA, UK, Australia and EC
Leather Products	West German, Jordan, UK
Hand Tools/Machine Tools	USA, Africa and Australia

Table 3.13 describes the direction of Punjab's exports. Table contains major items of export from Punjab and major importer countries of these items. The exports of hand tools and machine tools, are low technology engineering goods, exports are limited to few goods. Developing countries of Middle East, Africa and South East, U.S.A., Germany, U.K. are the major markets of hand tools. Major markets of sports goods are U.S.A., U.K., Australia and EC, which covers both developed and developing countries. Exports of sports goods are based on leather and wood based items, which are low technology and low price goods. Major markets of leather goods are West German, Jordan, U.K. etc. Leather goods again face very tough competition in the international markets, because these products require a lot of variety and quality to sustain in the international market. Major exporters of hosiery and readymade garment are Mainly USSR, Arabian Countries, Hong Kong, UK, Italy, USA, France, Malaysia & Singapore etc. Russia is the major market of hosiery/readymade garments. These products confront hard-hitting competition in international markets, because these requires good quality products with upgradation of technology, labor skills through training and diversification of markets.

3.3 EXPORTS PROMOTION COUNCIL

The prime function of the council is the fixation of annual target for exports and thereby decide upon the measures and promotional activities that are required to be undertaken for achieving the same. This entire exercise is carried out in consultation with the Ministry of Commerce, Government of India. The council also makes suggestions and recommendations on policy matters to the Government for consideration, particularly at the time of framing the annual Exim Policy and union budget. This export promotion council plays an important role. This acts as an interface between exports and various Government Agencies, customs, excise, Reserve Bank of India (RBI), Financial Institutions, Commercial Banks, Export Credit Guarantee Cooperation (ECGC), shipping lines, Freight Forwarders Association in all matters to ensure smooth growth in exports.

The council, with its network of foreign offices located abroad, assists its member exporters on an on-going basis for identifying potential products and markets there by

also generating business enquires for them. The foreign offices also regularly compile market survey reports are prepared for the benefit of the Indian exporters. The councils also organizes seminars and conferences on a wide range of topics on a regular basis to foster increased trade and formation of strategic alliances. The services of the council are planned in a manner to create an ambience for providing appropriate service to its members by taking up on their behalf issues related to policy and procedures for exports, timely availability of finance, coordination with financial institution, banks and other related services. The council keeps abreast of trends and opportunities in international markets to provide commercially useful information to its members so as to help, sustain and expand their exports. It also offers professional advice to the members in areas such as technology aggradations, quality and design improvement, product development, innovations, environment protections, standards and specifications.

It highlights issues related to small, medium and tiny sector exporters with the concerned authorities and also plays active role in providing market development assistance for the cause of export marketing and market entries.

The main objectives of the export promotion councils are compensation to the exporters for the high domestic cost of production, providing necessary assistance to the new and infant exporters to develop the export business and increase the relative profitability of the export business vis-à-vis the domestic business. Export Promotion Councils provide commercially useful information and assistance to their members for developing and increasing their exports, offer professional advice to their members in certain areas such as technology upgradation, quality improvement, standard maintenance, innovations etc., explore market opportunities, arrangement of trade fairs in Punjab/India and in the abroad, encourage interaction between the exporting countries and Governments both at Central and State level etc.

SUMMARY

No country, state or region can make progress on the basis of primary productive occupations alone, especially when such a region has a large and rapidly increasing

population. To achieve increasing income, higher standard of living, higher purchasing power, greater opportunities for jobs and over all development, better and efficient use of natural and agricultural resources is essential. Punjab is basically an agricultural state but after liberalization it shift from agriculture to industries and noticed a huge increments in industrial exports. The main industrial districts in Punjab are Ludhiana, Jalandhar and Amritsar and account for 90 per cent of exports from Punjab. Ludhiana is known for yarn and textile/Readymade garments/hosiery/Bicycle and bicycle parts industry, Jalandhar is known for Leather, sports and hand tool industry and Amritsar is also known for its Yarn and Textile /Ready Made Garments/ Hosiery industry. Punjab has highly developed small scale industries and has surplus of various small scale and other industrial and manufactured products such as bicycles, sewing machines, hosiery goods, leather goods, tools etc. Besides these medium and major industrial units, a large number of small scale and tiny units are also engaged in the manufacture of the same products. Export of Punjab was Rs. 10819 crore out of the total exports of Punjab Rs.19366 crores in 2012-2013. A large part of (about 94.5 per cent) of industrial exports of Punjab originated from its three major industrial districts; namely Ludhiana (51 per cent), Amritsar (18 per cent) and Jalandhar (21.7 per cent) in 1999-2000 and in the year 2001-2002 total exports from Jalandhar was Rs. 94764 Lakh, Amritsar Rs. 69512 Lakh and from Ludhiana Rs. 230364 Lakh. Punjab's total export in 2001-2002 was worth Rs. 440790 Lakh. From 2001-02 to 2011-12 the export as percent of GDP was 4.82. The per cent of ratio export to import was 70.37 per cent. There are no more variations in the share from the year 1989-90 to 2011-12. Only in the year 1997-98 this share increased to 3.32 but again this share reduced to 2.12 per cent in the year 2001-02. After 2003-04, it reduced 14 per cent to 7 per cent in 2011-12. Major exports from Punjab in international market are USSR, Arabian Countries, Hong Kong, UK, Italy, USA, France, Malaysia & Singapore, Australia etc. Export Promotion Councils provide useful information and assistance to increase exports from Punjab.

CHAPTER – 4

PERFORMANCE OF SELECTED EXPORT INDUSTRIES OF PUNJAB

This shall dwell on the second objective of the study:-

"To study the export performance of specially Yarn and Textiles, Hosiery and Ready Made Garments, Bicycle and Bicycle parts, Leather Products, Sports Goods, and Hand Tools industries".

Punjab is an agrarian economy and having a prominent feature of industrialization. There are almost 194,000 small scale industrial units in Punjab in adding together 586 large and medium units. Ludhiana is an chief centre for industry and known as "Manchester of India".

4.1 PERFORMANCE OF SELECTED EXPORT INDUSTRIES OF PUNJAB

Punjab has a number of small scale, medium scale and large-scale industrial units. Foremost Industries in the state include the metals, manufacturing, textiles, hosiery, yarn, sports goods, hand tools, bicycles, and light engineering goods. The areas of industrial thrust include agro-industry, electronics, dairy industry, pharmaceutical Industry and white goods industry.

Over the past five decades, the sports goods industry in India has witnessed an exceptional expansion and now occupies a place of prominence in the Indian economy in view of its enormous potential for employment, growth and export. There has been a growing emphasis on its planned development, designed for optimal utilization of resources and for maximizing the returns, particularly from exports. The Indian sports goods industry has its roots in Sialkot, Pakistan. When India was partitioned in 1947, many of Sialkot's skilled Hindu craftsmen migrated across the border into Punjab, settling in Jalandhar, where the Indian sports goods industry is now based. The Indian sports goods industry has extended to include the areas of Meerut, (Uttar Pradesh) and Gurgaon, (Haryana). Most of India's sports goods are exported to the United Kingdom,

the United States of America, Germany, France and Australia. The industry is primarily concentrated in Jalandhar and Meerut. The sports goods industry in Punjab mainly manufactures 318 items. However, major items that are exported are inflatable balls, hockey sticks and balls, cricket bats and balls, boxing equipment, fishing equipment, indoor games like carrom and chess boards and different kinds of protective equipment. The sports goods industry is a highly labour intensive industry which generates employment for the weaker sections of society and also employs a huge number of women.

Jalandhar acquired importance throughout the Mughal period. Twelve Muslim bastis (clusters of houses) came for subsistence including Basti Danishmanda, Basti Guzan and Basti Nau, which are now leading centres of the sports goods industry. Basti Nau has one of the major sports goods markets as well. Jalandhar ranks second in India in the rate of urbanization and ha the uppermost density of population. Now with the growth of the Industry it has spread to adjoining areas of Nakodar Road, basti Sheikh Road, Industrial Area, Sports Complex on Kapurthala road and G.T Road towards Amritsar. The skilled workers engaged in this industry are the most important parts for the production and are settled in Bhargav Camp, Gandi Camp, Basti Guzan, Basti Sheikh and Basti Daneshmandan, adjacent to the manufacturing unit. Over the years, the sports goods industry has developed at a remarkable rate and sports goods are also exported to various nations. Jalandhar has more than one hundred major industries and about 20,000 small scale industries with a most conservative estimate of an annual turnover of approximately Rs 450 crores. In Jalandhar, about 60 per cent of the sports goods that are manufactured consist of different types of inflatable balls. Besides inflatable balls, the other sports goods that are mostly manufactured are badminton racquets and shuttle cocks, cricket bats and balls, different types of gloves and protective equipment. More than 65 per cent of India’s export of Sports goods is from Jalandhar alone. Jalandhar (just 80 km from Amritsar International Airport) is an important supplier of quality Sports goods to more than 130 nations including various most developed nations of the world. The Jalandhar based industry is quick in implementation of new technology and adapting its products to keep up with the

changing global trends so as to become the most essential center for manufacture. (Directorate of Industries, Punjab)

The term ‘hand tool’ is usually applied to tools used by hand. These are quite small sized tools, but are necessary for manufacture and maintenance of plants, machinery and equipment. The use of hand tools covers approximately all sorts of industries, viz., engineering, electrical and electronics, construction, plumbing, etc., different kinds of servicing industries and also certain kinds of production processes irrespective of their size and scale of operation i.e., small, medium or large. Deficiency of these tools would in fact paralyze every kind of industrial activity. Wrenches, hand drills, pullers, vices, hammers, screwdrivers, pliers, spanners, clamps, cramps, etc. are commonly used hand tool in Industries. hand tools, such as flaring tools, pullers, ring expanders and compressors, screw and stud extractors, tyre valve pull-out tools, flanging tools, valve lifters and reseating tools, etc., are comprehensively used in automobile repair workshops and garages. They also have important applications in the household sector in day to day life. The hand tools industry is concentrated in Jalandhar and Ludhiana. With the partition of the country in 1947, there was a large scale influx of people, together with industrialists and artisans, from West Pakistan. A few of them started small manufacturing units for their survival. Some incentives given by government helped these people to recover themselves and set up their industries. Owing to severe shortage of foreign exchange and consequential restrictions on the import of different items, including hand tools, the domestic hand tools industry got a comparative advantage in the home market. This jointly improved effective demand in this sector, lead to promoted investment. In such encouraging economic conditions, the hand tools industry of Punjab grew speedily. Jalandhar is also well-known for the manufacturing of Hand Tools such as Spanner set, screw driver, nose pliers etc. 50 units are occupied in the manufacturing of hand tools and provide employment to 8000 persons. Hand Tools Industry consists of organized, small scale and cottage sector. About 80 per cent of small scale and cottage sector is situated in and around Jalandhar in Punjab, Nagaur in Rajasthan and Purulia in West Bengal.

The Hand Tools Industries play a very important role in economic development and earning valuable foreign exchange for the nation. With a view to provide technology support services to engineering industry in general and the hand tools industries in particular, the Government of India has set up Central Institute of Hand Tools as a National Institute in Jalandhar, in the state of Punjab as an autonomous organization with the support of U.N.D.P and Govt. of Punjab. Jalandhar is the world's largest manufacturer of leather tool pouches and aprons with major American and European consumers buying from factories in Jalandhar. (Director of Industries, Punjab)

India is 2nd leading manufacturer of bicycles and bicycle parts in the world, produced 13.1 million bicycles in 2000, after China. Ludhiana and areas around it have emerged as a natural cluster for the bicycle industry, with small, tiny, and medium, industrial units, using conventional and modern techniques of production, but not well organized and systematic after independence. These units are situated in a haphazard mode causing substantial environmental degradation and other problems. Unless a systematic and planned cluster approach is followed, further progress of the industry and even the present trend of growth will not be sustainable. Ludhiana cluster creates about 60 per cent of the total bicycles manufactured in the country in the large and small scale sector and more than 80 per cent of the parts and components in the small and tiny sector. The first indigenously owned bicycle manufacturing unit, Atlas Cycles, was established at Sonepat in 1951 in the small scale industry sector in undivided Punjab. Hero Cycle Ltd. commenced production of entire bicycles in 1956 as a small scale industry unit in Ludhiana and became the world’s leading producer of bicycles in 1989, with a record production of 29,36,076 units and entered the Guinness Book of World Records.

Although the bicycle industry was started Kolkata, Punjab became the most fruitful ground for its development and growth. It largely manufactures the roadster model (70 per cent of total production) with average single speed with cosmetic variations. The remaining 30 per cent of the manufacture is of new models, such as Sporty Light

Roadster (SLR), All Terrain Bike (ATB), British Motor Cross (BMX), Mountain Terrain Bike (MTB), Racer, children, juvenile, etc. These bicycles are moderately heavy in weight, varying between 10 to 18 kg. The unique facet of this industry of Punjab is that the components and parts are manufactured is about 4,000 tiny and small units for domestic as well as export markets. More than 80 per cent of the entire components and parts of whole bicycles are produced in the tiny and small scale industries. During 1995-96 to 1999-2000, production has enlarged at an average annual growth rate of 12.8 per cent. As it is beyond the capabilities of the existing small scale sector, it is completely essential to suitably reshuffle and strengthen the Research & Development Centre for Bicycles & Sewing Machines at Ludhiana. (Director of Industries, Punjab)

Textile Industry occupies a unique place in India, being one of the initial industry to come into existence in India. In Punjab, textile Industry is making momentous contribution to the State's economy and to the national foreign exchange earnings. It adds about 19 per cent to the whole industrial manufacture in the State and contributes to almost 38 per cent of the entire exports from Punjab. Textile is the only Industry which is self-dependent and absolute in value addition i.e. from raw material to the maximum value added products garments/made-ups. Consequently, the growth and development of this Industry has a considerable attitude on the whole development of the economy. The textile industry is one of the biggest provider of employment and accounts of approximately 60 per cent of industrial employment in the State of Punjab. It has been noted that even with high level of mechanization, the probability of machine replacing human is least in the sector due to necessary skill constraint. It generates employment opportunity for partially literates and poorer section of the society where the incidents of unemployment are most obtrusive. In Punjab, the textile and hosiery industry can be classified into two groups i.e. hosiery & readymade garments and textiles. Most significantly the textile sector is one of the leading employment generating sectors for women. Therefore any improvement in textile industry will

absolutely provide an opportunity of mployment to the youth in Punjab. Ludhiana is well-known worldwide for its hosiery and knitting industry. The history of hosiery in Ludhiana can be traced back to 1902-1903, when the first unit for manufacturing woolen socks was set up. During the years that followed this industry in Ludhiana progressed gradually. And till recent years, major trading associate for the export of hosiery knit wear, was the USSR. However, after its collapse, exports have diversified to other markets such as Europe, USA and other highly developed nations. Yarn is the fundamental raw material for textile, hosiery and readymade garments. Proper blended yarn of essential quality is not available at a sensible price. The dyeing processes at present are very power consuming, incompetent and polluting and in house testing facilities for colour matching and colour fastness are not accessible in most of the units. Designs usually are copies from magazines, journals, or samples provided by the buyers. The greater parts of the units have not adopted Computer Aided Designing Manufacturing (CADM). The Punjab Small Industries & Export Corporation with the Association of textile industry is already establishing Punjab APPAREL Park called M/s Punjab APPAREL Park Ltd. at Doraha, in Distt. Ludhiana. This is going to be developed as incorporated textile park with all necessary facilities at one place for the textile industry and is probable to give a main boost to textile industry in Punjab. (Director of Industries, Punjab)

The leather industry in Punjab is primarily clustered in Jalandhar and specializes in the processing of buffalo hides into finished leather, which is frequently exported. There are about 50 tanneries, and about 20-25 units are ancillaries and manufacturers of leather products such as footwear, garments and goods. Compared to other leather clusters such as Kanpur and Chennai, the Jalandhar firms have not gone for onward integration into the manufacturing of products such as footwear, goods and accessories, thus missing out on value added exports. Clusters and technology park instruments can be used efficiently to build on the pre-existing local business in leather products, sports goods and other manufacturing.

Table 4.1 : Exports from Punjab of Selected Industries from 1990 to 2014

(Rs. Crore)

Year	Readymade Garments & Hosiery	Cycle & Cycle Parts	Sports Goods	Yarn & Textiles	Leather Goods	Hand Tools/ Machines	Total exports
1990-91	291	66	26	29	30	20	769
1991-92	268	171	34	19	30	18	901
1992-93	185	296	41	19	40	19	1215
1993-94	330	518	32	36	47	28	1816
1994-95	348	401	100	72	59	53	2082
1995-96	422	436	118	165	53	58	2565
1996-97	487	706	225	656	79	44	3025
1997-98	508	890	246	831	104	352	4205
1998-99	445	462	161	862	83	300	3629
1999-00	518	516	193	918	114	350	3676
2000-01	525	520	204	934	18	321	4015
2001-02	816	466	274	987	206	437	4408
Average	**428.53**	**454.07**	**137.87**	**460.73**	**71.84**	**166.68**	**2692**
2002-03	1261	763	285	1572	130	417	7014
2003-04	1312	858	396	1733	66	872	8933
2004-05	970	950	366	2418	191	710	7914
2005-06	985	1184	471	3362	133	968	9656
2006- 07	1306	1434	563	2676	198	1715	11798
2007- 08	2190	1044	552	2223	108	1126	10710
2008-09	1977	993	457	3673	218	1102	13888
2009-10	2584	951	1196	3545	234	1292	15972
2010-11	5408	296	393	400	85	279	17430
2011-12	3143	1283	1656	6520	367	231	21302
2012-13	4275	1579	1024	3460	226	255	19366
2013-14	3709	1431	1340	4990	297	243	20334
Average	**2426.6**	**1063.8**	**724.9**	**3047.6**	**187.7**	**767.5**	**13693**

Source: Statistical Abstract of Punjab (Various issues)

Table 4.1 depicts the total value of exports of selected industries from Punjab. The major sectors which have made significant contribution towards exports from the state are woollen textiles, bicycles and parts, hosiery goods, hand tools, leather products, and sports goods. The average of total exports of selected industries from 1990-91 to 2001-02 was Rs. 2992 crore. It increased to Rs. 13693 crore during the period 2002-03 to 2013-14. Technology up gradation and improvement in infrastructure was the main cause to increase in the average of total exports from Punjab. During the year 1990-91 to 2001-02 average export growth of readymade garments and hosiery increases from Rs. 428.53 crore to Rs. 2426.6 crore in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 average export growth of cycle and cycle parts increases from Rs. 137.87 crore to Rs. 1063.8 crore in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 average export growth of sports goods increases from Rs. 454.07 crore to Rs. 724.9 crore in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 average export growth of yarn and textile increases from Rs. 460.73 crore to Rs. 3047.6 crore in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 average export growth of leather goods increases from Rs. 71.84 crore to Rs. 187.7 crore in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 average export growth of hand tools/machines increases from Rs. 166.68 crore to Rs. 767.5 crore in 2002-03 to 2013-14. All the selected industries exports increased given period but average of exports rapidly increased from 2002-03 to 2013-14. The reasons behind this increment were technology and easy availability of raw material in Punjab. Punjab is a land of boundless opportunity for agriculture as well as industry development.

Table 4.2 : t- statistics Exports from Punjab of Selected Industries from 1990 to 2014

One-Sample Test							One-Sample Statistics		
	Test Value = 0								
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Mean	Std. Deviation	Std. Error Mean
					Lower	Upper			
Readymade Garments & Hosiery	1.429	1	.389	1427.56500	-11266.3782	14121.5082	1427.5650	1412.84885	999.0350030
Cycle & Cycle Parts	2.489	1	.243	758.93500	-3114.7421	4632.6121	758.9350	431.14422	4.86500
Sports Goods	1.470	1	.380	431.38500	-3298.0767	4160.8467	431.3850	415.09289	293.51500
Yarn & Textiles	1.356	1	.404	1754.16500	-14680.4849	18188.8149	1754.1650	1829.19332	1293.43500
Leather Goods	2.240	1	.267	129.77000	-606.3004	865.8404	129.7700	81.92539	57.93000
Hand Tools/ Machines	1.555	1	.364	467.09000	-3349.9810	4284.1610	467.0900	424.843907	300.4100055
Total exports	1.489	1	.376	8192.500	-61697.98	78082.98	8192.50	778.882	00.500

To compare the relationship between two decades of study period, first decade was from 1990-91 to 2001-02, second decade was from 2002-03 to 2013-14 were significant or not, t-test was applied. At 2 tailed all the selected industry exports was significant.

Table 4.3 : Export Performance of Punjab during 1989-2012

Year	Exports (Rs. Crore)	Exports Index (2004-05=100)	Real Exports (Constant Prices)
1990-91	769	10	7290
1991-92	901	11	6007
1992-93	1215	15	5283
1993-94	1815	23	6985
1994-95	2082	26	8008
1995-96	2442	32	8016
1996-97	3025	38	7960
1997-98	4205	53	7934
1998-99	3629	46	7889
1999-2000	4063	46	7991
2000-01	4015	51	7873
2001-02	4408	56	7871
Average	**2714.08**		**7425.58**
2002-03	7014	89	7881
2003-04	8933	113	8545
2004-05	7914	100	7914
2005-06	9656	122	7915
2006-07	11798	149	7918
2007-08	10710	135	7933
2008-09	13888	175	7936
2009-10	15972	202	7907
2010-11	17430	220	7260
2011-12	21302	269	7919
2012-13	19366	246	7589
Average	**13089.36**		**7883.36**

Source : Govt. of Punjab, *Statistical Abstract of Punjab* (various Issues)

Table 4.4 : Percentage Share of Exports of Selected Industries in Total Exports of Punjab.

Year	Readymade Garments & Hosiery	Cycle & Cycle Parts	Sports Goods	Yarn & Textiles	Leather Goods	Hand Tools / Machines
1990-91	37.83	8.58	3.38	3.77	3.90	2.60
1991-92	29.75	18.98	3.77	2.11	3.33	2.00
1992-93	15.23	24.37	3.38	1.56	3.29	1.56
1993-94	18.18	28.53	1.76	1.98	2.59	1.54
1994-95	16.71	19.26	4.80	3.46	2.83	2.55
1995-96	16.45	17.00	4.60	6.43	2.07	2.26
1996-97	16.10	23.35	7.43	21.69	2.62	1.45
1997-98	12.07	21.16	5.86	19.75	2.47	8.37
1998-99	12.26	12.74	4.45	23.76	2.28	8.28
1999-00	14.09	14.04	5.25	24.98	3.09	9.52
2000-01	13.07	12.96	5.08	23.27	0.45	7.99
2001-02	18.51	10.57	6.21	22.39	4.67	9.91
Average	**18.35**	**17.63**	**4.66**	**12.93**	**2.80**	**4.84**
2002-03	17.97	10.87	4.07	22.41	1.85	5.95
2003-04	14.68	9.61	4.43	19.40	0.74	9.77
2004-05	12.26	12.01	4.62	30.56	2.41	8.97
2005-06	10.20	12.26	4.88	34.82	1.38	10.02
2006- 07	11.07	12.16	4.78	22.68	1.68	14.53
2007- 08	20.45	9.75	5.15	20.76	1.01	10.52
2008-09	14.24	7.15	3.29	26.45	1.57	7.94
2009-10	16.18	5.95	7.49	22.19	1.47	8.09
2010-11	31.03	1.70	2.26	2.30	0.49	1.60
2011-12	14.75	6.02	7.77	30.61	1.73	1.09
2012-13	22.07	8.15	5.29	17.87	1.17	1.32
2013-14	20.78	8.01	8.21	20.45	1.98	1.31
Average	**17.14**	**8.63**	**5.18**	**22.54**	**1.45**	**6.75**

Source: Statistical Abstract of Punjab (Various issues)

Table 4.3 reveals the real exports from Punjab during 1990-2013. During 1990-91 to 2001-02, the average of real exports of selected industries from Punjab increased from Rs. 7425.58 crore to Rs. 7883.36 crore (2002-03 to 2012-13). 2002 onwards the exports from Punjab show tremendous growth, which clearly shows increase in the volume of exports. For calculating the index, 2004-05 has been considered as a base year. This also shows the increasing trend.

Table 4.4 depicts the percentage share of exports of readymade garments & hosiery, cycle and cycle parts, sports good, yarn and textile, leather goods and hand tool/machines industries in total exports of Punjab. During the year 1990-91 to 2001-02 the average percentage share of readymade and hosiery exports decreased from 18.35 per cent to 17.14 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the average percentage share of cycle and cycle parts exports decreased from 17.63 per cent to 8.63 per cent in 2002-03 to 2013-14. There was a huge amount of difference because of cheap imports of cycle and cycle parts from China and customers prefer buying the cheap Chinese products. All cycle parts are now imported from China. During the year 1990-91 to 2001-02 the average percentage share of sports good exports increased from 4.66 per cent to 5.18 per cent in 2002-03 to 2013-14. Very little fluctuation was observed in exports of sport goods industry because of tax burden, lack of raw material, and Chinese good onslaught. During the year 1990-91 to 2001-02 the average percentage share of yarn and textile exports increased from 12.93 per cent to 22.54 per cent in 2002-03 to 2013-14. The reason for increase in percentage was adoption of new technology in yarn and textile industry and easy availability of raw material in Punjab. During the year 1990-91 to 2001-02 the percentage share of leather goods exports decreased from 2.80 per cent to 1.45 per cent in 2002-03 to 2013-14. Due to global meltdown, it affect greatly on the leather industry. During the year 1990-91 to 2001-02 the percentage share of hand tools/machines exports increased from 4.84 per cent to 6.75 per cent in 2002-03 to 2013-14 because this industry get R&D benefits and adopt new technology, which save input costs drastically and importing state-of-the-art machinery and the latest technology from Taiwan, especially Cold Forging Technology and Blue Moulding Technology.

Table 4.5 : T- statistics for Percentage Share of Exports of Selected Industries in Total Exports of Punjab.

One-Sample Test							One-Sample Statistics		
	Test Value = 0								
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference				
					Lower	Upper	Mean	Std. Deviation	Std. Error Mean
Readymade Garments & Hosiery	29.331	1	0.022	17.745	10.0577	25.4323	17.745	0.8556	0.605
Cycle & Cycle Parts	2.918	1	0.21	13.13	-44.0479	70.3079	13.13	6.36396	4.5
Sports Goods	18.923	1	0.034	4.92	1.6164	8.2236	4.92	0.3677	0.26
Yarn & Textiles	3.691	1	0.168	17.735	-43.3183	78.7883	17.735	6.7953	4.805
Leather Goods	3.148	1	0.196	2.125	-6.452	10.702	2.125	0.9546	0.675
Hand Tools/Machines	6.068	1	0.104	5.795	-6.3394	17.9294	5.795	1.35057	0.955

To compare the relationship between two decades of study period for percentage share of exports of selected industries, first decade was from 1990-91 to 2001-02, second decade was from 2002-03 to 2013-14 were significant or not, t-test was applied. At 2 tailed all the selected industry exports was significant except readymade garments and hosiery industry.

Figure 4.1 : Percentage Share Of Exports Of Selected Industries in Total Exports Of Punjab.

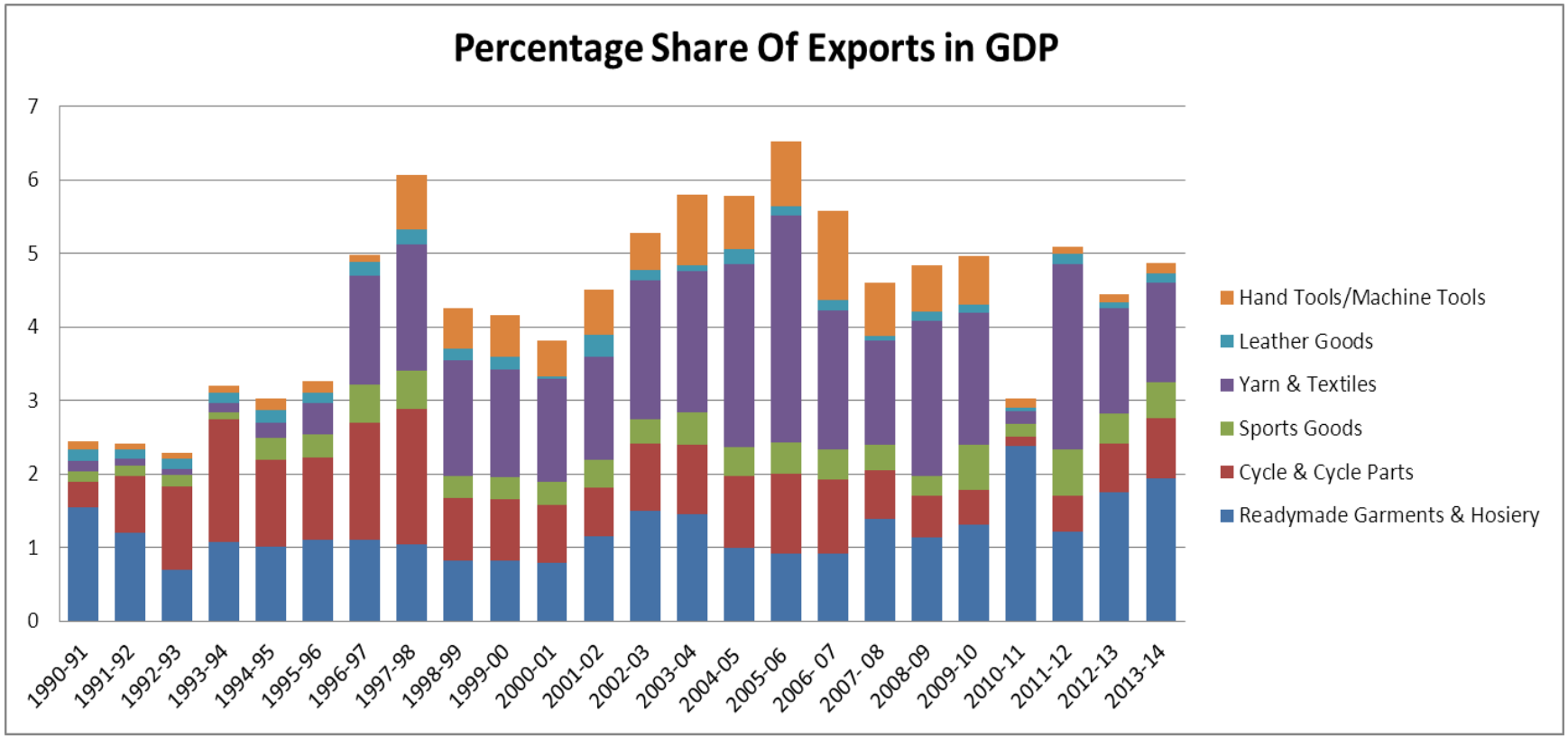


Figure 4.1 descibes the percentage share of exports of selected industries in total exports of Punjab.

Table 4.6 : Percentage Share Of Exports Of Selected Industries In GDP Of Punjab

Year	Readymade Garments & Hosiery	Cycle & Cycle Parts	Sports Goods	Yarn & Textiles	Leather Goods	Hand Tools / Machine Tools
1990-91	1.54	0.35	0.14	0.15	0.16	0.11
1991-92	1.20	0.77	0.15	0.09	0.13	0.08
1992-93	0.70	1.13	0.16	0.07	0.15	0.07
1993-94	1.07	1.67	0.10	0.12	0.15	0.09
1994-95	1.02	1.18	0.29	0.21	0.17	0.16
1995-96	1.10	1.13	0.31	0.43	0.14	0.15
1996-97	1.10	1.60	0.51	1.49	0.18	0.10
1997-98	1.05	1.84	0.51	1.72	0.21	0.73
1998-99	0.82	0.85	0.30	1.58	0.15	0.55
1999-00	0.83	0.82	0.31	1.46	0.18	0.56
2000-01	0.79	0.79	0.31	1.41	0.03	0.49
2001-02	1.15	0.66	0.39	1.40	0.29	0.62
Average	**1.03**	**1.07**	**0.29**	**0.84**	**0.16**	**0.31**
2002-03	1.50	0.91	0.34	1.88	0.15	0.50
2003-04	1.45	0.95	0.44	1.92	0.07	0.97
2004-05	1.00	0.98	0.38	2.50	0.20	0.73
2005-06	0.91	1.09	0.43	3.09	0.12	0.89
2006- 07	0.92	1.01	0.40	1.89	0.14	1.21
2007- 08	1.39	0.66	0.35	1.41	0.07	0.72
2008-09	1.14	0.57	0.26	2.11	0.13	0.63
2009-10	1.31	0.48	0.61	1.79	0.12	0.65
2010-11	2.38	0.13	0.17	0.18	0.04	0.12
2011-12	1.21	0.49	0.64	2.52	0.14	0.09
2012-13	1.76	0.65	0.42	1.42	0.09	0.10
2013-14	1.94	0.82	0.48	1.36	0.12	0.15
Average	**1.40**	**0.72**	**0.41**	**1.83**	**0.11**	**0.56**

Source: Statistical Abstract of Punjab (Various issues)

Table 4.6 depicts the percentage share of exports readymade garments & hosiery, cycle and cycle parts, sports good, yarn and textile, leather goods and hand tool/machines industries in GDP of Punjab. During the year 1990-91 to 2001-02 the percentage share of readymade and hosiery exports in GDP increased from 1.03 per cent to 1.40 per cent in 2002-03 to 2013-14. Punjab is rich in agricultural raw material. Easy availability of raw material was main cause of increase in the export share of readymade and hosiery in GSDP of Punjab. During the year 1990-91 to 2001-02 the percentage share of cycle and cycle parts exports in GDP decreased from 1.07 per cent to 0.72 per cent in 2002-03 to 2013-14. Lack of new and cheap technology in cycle and cycle part industry was cause to decrease export share in Punjab GSDP. During the year 1990-91 to 2001-02 the percentage share of sports good exports increased from 0.29 per cent to 0.41 per cent in 2002-03 to 2013-14. Very little fluctuation was observed in exports share of sport goods industry in State GDP. During the year 1990-91 to 2001-02 the percentage share of yarn and textile exports in GDP increased from 0.84 per cent to 1.83 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the percentage share of leather goods exports in GDP decreased from 0.16 per cent to 0.11 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the percentage share of hand tools/machines exports in GDP increases from 0.31 per cent to 0.56 per cent in 2002-03 to 2013-14. Lack of infrastructure, high rate of taxes levied by state government problems in Punjab was suffered by the Punjab's exporters. That is why the exports share of some industry was decline in GSDP of Punjab.

Table 4.7 : T- Statistics for Percentage Share Of Exports Of Selected Industries In GDP Of Punjab

One-Sample Test							One-Sample Statistics		
	Test Value = 0								
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Mean	Std. Deviation	Std. Error Mean
					Lower	Upper			
Readymade Garments & Hosiery	6.568	1	0.096	1.215	-1.1356	3.5656	1.215	0.26163	0.185
Cycle & Cycle Parts	5.114	1	0.123	0.895	-1.3286	3.1186	0.895	0.24749	0.175
Sports Goods	5.833	1	0.108	0.35	-0.4124	1.1124	0.35	0.08485	0.06
Yarn & Textiles	2.697	1	0.226	1.335	-4.9546	7.6246	1.335	0.70004	0.495
Leather Goods	5.4	1	0.117	0.135	-0.1827	0.4527	0.135	0.03536	0.025
Hand Tools / Machine Tools	3.48	1	0.178	0.435	-1.1533	2.0233	0.435	0.17678	0.125

To compare the relationship between two decades of study period for percentage share of exports of selected industries in GDP of Punjab, first decade was from 1990-91 to 2001-02, second decade was from 2002-03 to 2013-14 were significant or not, t-test was applied. At 2 tailed all the selected industry exports was significant, here reject the all null hypothesis for selected industries.

Figure 4.2 : Percentage Share of Export of Selected Items in State Domestic Product

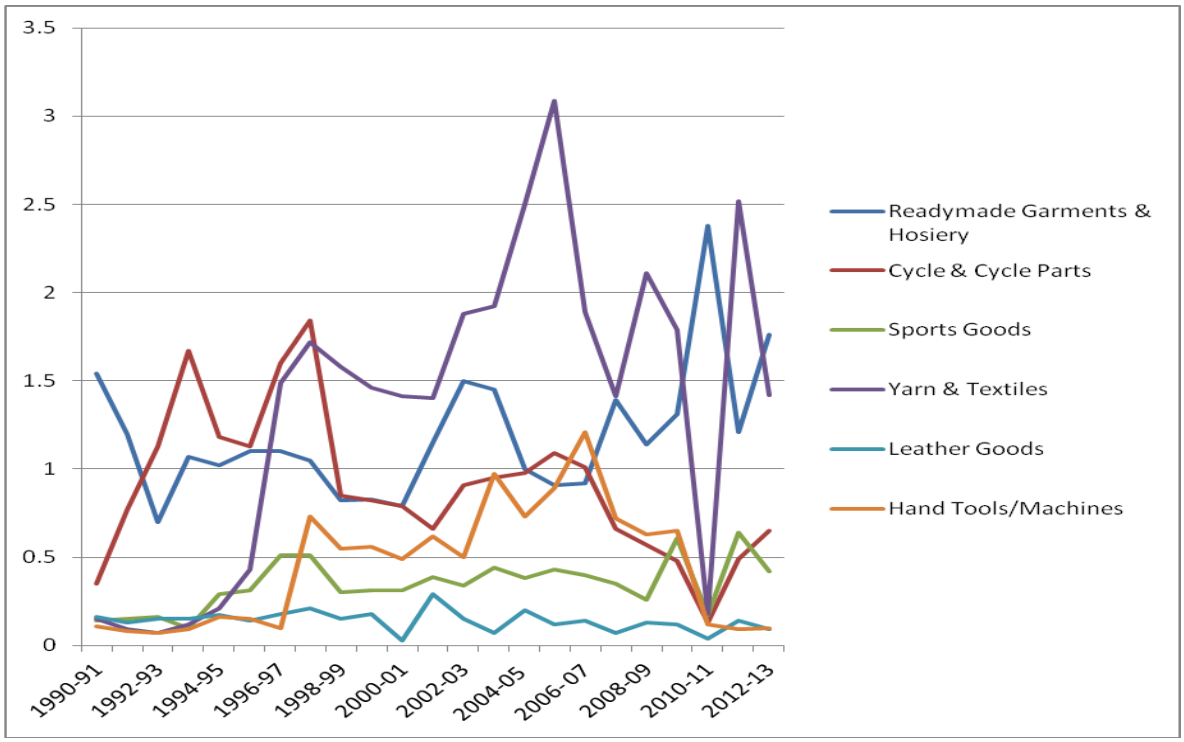


Figure 4.2 explains the percentage share of export of selected industries in state domestic product.

Table 4.8 : Annual Growth Rates of Exports of Selected Industries of Punjab from 1991 to 2013

Year	Readymade Garments & Hosiery	Cycle & Cycle Parts	Sports Goods	Yarn & Textiles	Leather Goods	Hand Tools / Machines
1991-92	-0.08	1.59	0.31	-0.34	0.00	-0.10
1992-93	-0.31	0.73	0.21	0.00	0.33	0.06
1993-94	0.78	0.75	-0.22	0.89	0.18	0.47
1994-95	0.05	-0.23	2.13	1.00	0.26	0.89
1995-96	0.21	0.09	0.18	1.29	-0.10	0.09
1996-97	0.15	0.62	0.90	2.98	0.50	-0.24
1997-98	0.04	0.26	0.10	0.27	0.31	7.00
1998-99	-0.12	-0.48	-0.34	0.04	-0.20	-0.15
1999-00	0.16	0.12	0.20	0.06	0.38	0.17
2000-01	0.01	0.01	0.06	0.02	-0.84	-0.08
2001-02	0.56	-0.10	0.34	0.06	10.34	0.36
Average	**0.13**	**0.31**	**0.35**	**0.57**	**1.01**	**0.77**
2002-03	0.54	0.64	0.04	0.59	-0.37	-0.04
2003-04	0.04	0.13	0.39	0.10	-0.49	1.09
2004-05	-0.26	0.11	-0.08	0.40	1.87	-0.19
2005-06	0.01	0.25	0.29	0.39	-0.30	0.36
2006- 07	0.33	0.21	0.20	-0.20	0.48	0.77
2007- 08	0.68	-0.27	-0.02	-0.17	-0.45	-0.34
2008-09	-0.10	-0.05	-0.17	0.65	1.01	-0.02
2009-10	0.31	-0.04	1.62	-0.03	0.07	0.17
2010-11	1.09	-0.69	-0.67	-0.89	-0.64	-0.78
2011-12	-0.42	3.33	3.21	15.29	3.31	-0.17
2012-13	0.36	0.23	-0.38	-0.47	-0.38	0.10
2013-14	0.83	0.21	1.32	0.54	0.78	0.92
Average	**0.28**	**0.33**	**0.47**	**1.35**	**0.40**	**0.15**

Source: Statistical Abstract of Punjab (Various issues)

Figure 4.3 : Annual Growth Rates of Exports of Selected Industries of Punjab from 1991 to 2013

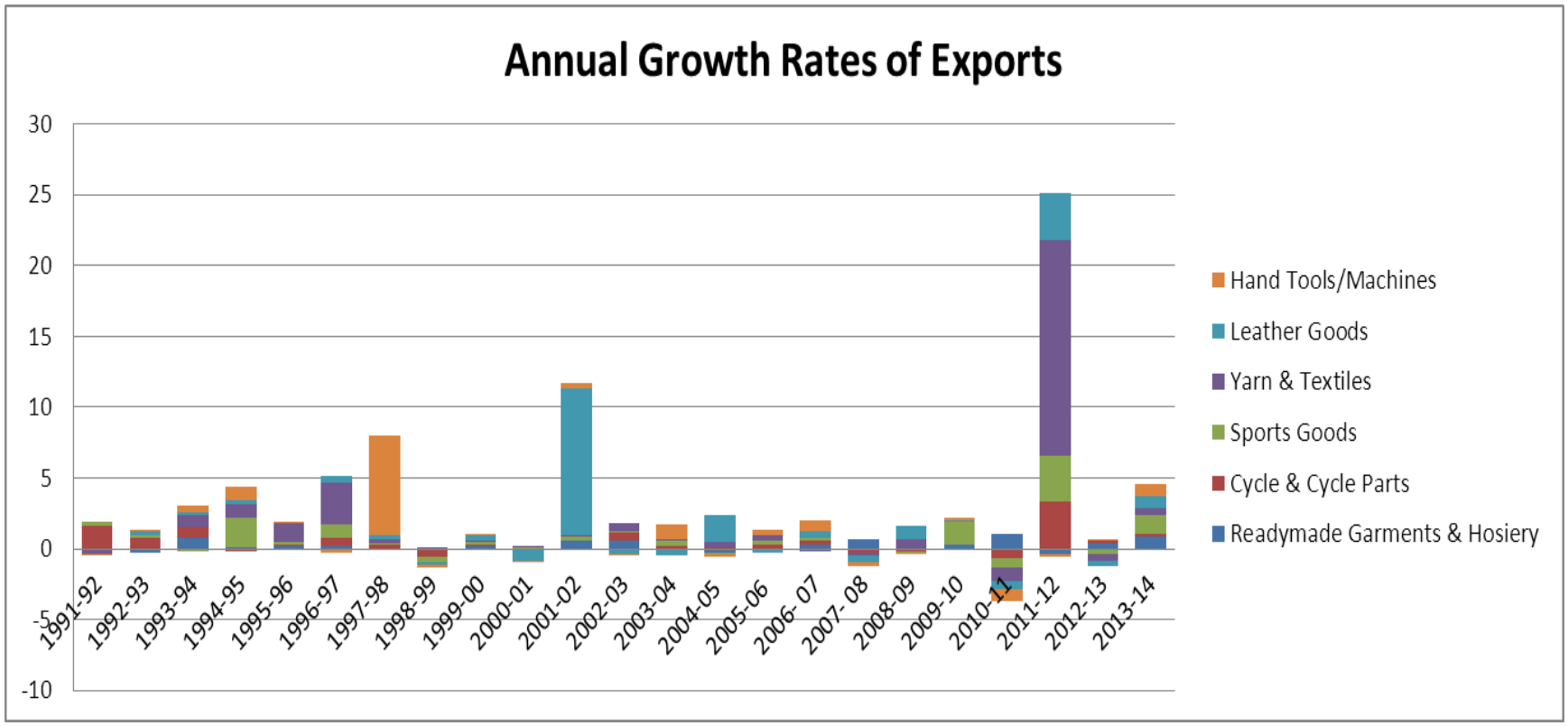


Table 4.9 : Annual Growth Rates of Exports of Selected Industries of Punjab from 1991 to 2014

One-Sample Test							One-Sample Statistics		
	Test Value = 0								
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference		Mean	Std. Deviation	Std. Error Mean
					Lower	Upper			
Readymade Garments & Hosiery	2.733	1	0.223	0.205	-0.748	1.158	0.205	0.10607	0.075
Cycle & Cycle Parts	32	1	0.02	0.32	0.1929	0.4471	0.32	0.01414	0.01
Sports Goods	6.833	1	0.093	0.41	-0.3524	1.1724	0.41	0.08485	0.06
Yarn & Textiles	2.462	1	0.246	0.96	-3.9954	5.9154	0.96	0.55154	0.39
Leather Goods	2.311	1	0.26	0.705	-3.1704	4.5804	0.705	0.43134	0.305
Hand Tools/Machines	1.484	1	0.378	0.46	-3.4789	4.3989	0.46	0.43841	0.31

Table 4.8 depicts the year on year growth of exports readymade garments & hosiery, cycle and cycle parts, sports good, yarn and textile, leather goods and hand tool/machines industries. During the year 1990-91 to 2001-02 the growth rate of readymade and hosiery exports increased to 0.28 per cent from 0.13 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the growth rate of cycle and cycle parts exports increased from 0.31 per cent to 0.33 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the growth rate of sports good exports increased from 0.35 per cent to 0.47 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the growth rate of yarn and textile exports increased from 0.57 per cent to 1.35 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the growth rate of leather goods exports decreased from 1.01 per cent to 0.40 per cent in 2002-03 to 2013-14. During the year 1990-91 to 2001-02 the growth rate of hand tools/machines exports decreased from 0.77 per cent to 0.15 per cent in 2002-03 to 2013-14.

To compare the relationship between two decades of study period for annual growth rate of exports of selected industries, first decade was from 1990-91 to 2001-02, second decade was from 2002-03 to 2013-14 were significant or not, t-test was applied (Table 4.9). At 2 tailed all the selected industry exports was significant except cycle and cycle parts, hence rejection of the all null hypothesis for selected industries. The null hypothesis was accepted only in case of cycle and cycle parts, that annual growth rate of exports was not significant.

Figure 4.4 : **Annual Growth Rates of exports of selected industries from Punjab from 1991 to 2012**

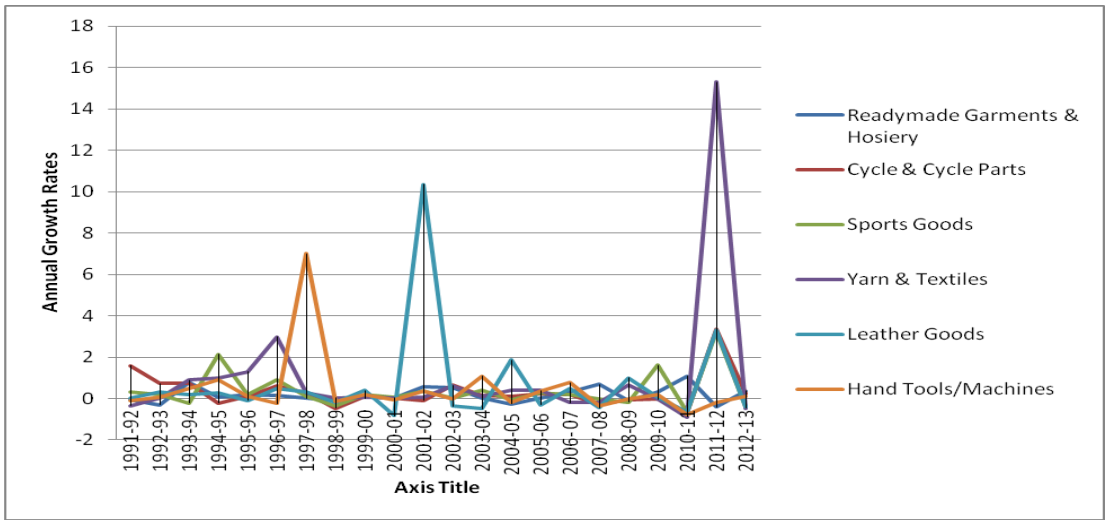


Figure 4.4 explains the annual growth rates of exports of selected industries from Punjab from 1991 to 2012**.**

Table 4.10 : Correlation Tests between Export of Selected Commodities and Gross Domestic Product (GDP).

	GDP	**EXPORT**
GDP	1	0.9537673676920115
EXPORT	0.9537673676920115	1

Table 4.10 depicts that GDP and Exports had highly positive correlation as shown in table 0.953**.** The correlation coefficient between the GDP and EXP are very high and statistically significant at 1 per cent level throughout the study periods.

4.2 ORDINARY LEAST SQUARE TECHNIQUE

This section presents the nexus between export and economic growth in terms of OLS Technique.

Table 4.11 : OLS Technique

Dependent Variable is GDP					
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**R2**	**F Statistics**
C	8538.893	7918.372	1.078365		
EXPORT	19.57911	1.346330	14.54258	0.909672	211.4865
Dependent Variable is EXPORT					
GDP	0.046461	0.00319	14.54258	0.909672	211.4865

Ho: There is no relationship between the GDP and Export and vice versa
In ordinary least square Method, we reject the hypothesis that there is no relationship between the variable and the results of the Ordinary Least Squares Regression are summarized in the Table 4.11. The empirical analysis on basis of ordinary Least Square Method suggests that there is positive relationship between GDP and EXPORT of selected commodities and vice versa.

Augmented Dickey Fuller Unit Root Test on Export: Unit roots use to find the stationarity properties of the data. Augmented Dickey-Fuller (ADF) Mests. The lag length for the ADF tests was selected to ensure that the residuals were white noise.

Table 4.12 : Augmented Dickey Fuller Unit Root Test on Export

Intercept only			
Variables	**ADF (0)**	**ADF(1)**	**ADF (2)**
LOGEXPORT	-1.869069	-6.252810	-3.582152
AIC	-0.025557	0.056580	0.598071
SBC	0.12366	0.156059	0.887792
DW	2.234287	2.057871	2.269484
Prob. *	0.3393	0.0000	0.0191
Test Critical Values			
1% levels	-3.920350		
5% levels	-3.065585		
10% levels	-2.673459		

Table 4.12 explains the Augmented Dickey Fuller Unit Root Test on Export**.** In this case Durbin Watson statistics is 2.23 which means test is reliable (no auto correlation among residuals). Hence the null hypothesis that series has unit root cannot be rejected. The Augmented Dickey Fuller Unit Root Test on Export with first difference**.** In this case Durbin Watson statistics is 2.06 which means test is reliable (no auto correlation among residuals). Hence the null hypothesis that series has unit root can be rejected. The series is stationary at first difference. The Augmented Dickey Fuller Unit Root Test on Export with second difference**.** In this case Durbin Watson statistics is 2.26 which means test is reliable (no auto correlation among residuals). ADF is -3.58 which is less than the critical values at 1% level of significance. Hence the null hypothesis that series has unit root can be rejected. The series is stationary at second difference.

The null hypothesis of unit root is accepted for all the variables, which means that the time series in levels were non-stationary. However, the null hypothesis of the unit root is rejected for the first differenced variables, implying all the variables are with first differenced stationary or integrated of order one, have not a deterministic trend.

Augmented Dickey Fuller Unit Root Test on GDP:

Null Hypothesis: GDP has a unit root

Table 4.13 : Augmented Dickey Fuller Unit Root Test on GDP

Intercept only			
Variables	**ADF (0)**	**ADF(1)**	**ADF (2)**
LOGGDP	-1.483541	-3.494614	-4.375042
AIC	-2.732597	-2.588051	-2.331958
SBC	-2.633411	-2.438691	-2.134097
DW	1.730146	1.581384	1.681537
Prob. *	0.5229	0.0193	0.0035
Test Critical Values			
1% levels	-3.857386		
5% levels	-3.040391		
10% levels	-2.660551		

Table 4.13 explains the Augmented Dickey Fuller Unit Root Test on GDP**.** In this case Durbin Watson statistics is 1.7 which means test is reliable (no auto correlation among residuals). Hence the null hypothesis that series has unit root cannot be rejected. The Augmented Dickey Fuller Unit Root Test on GDP with first difference**.** In this case Durbin Watson statistics is 1.6 which means test is reliable (no auto correlation among residuals). Hence the null hypothesis that series has unit root can be rejected. The series is stationary at first difference. The Augmented Dickey Fuller Unit Root Test on GDP with second difference**.** In this case Durbin Watson statistics is 1.7 which means test is reliable (no auto correlation among residuals). ADF is -4.375042 which is less than the

critical values at 1%, 5% and 10% level of significance. Hence the null hypothesis that series has unit root can be rejected. The series is stationary at second difference.

Johansen Co-integration Test: The Johansen co-integration test for log GDP and log Export, tested whether there is a co-integrating relationship between export and GDP.

Table 4.14 : Johansen Co-integration Test

Hypothesized		Trace	0.05		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	Statistic	Critical Value	Prob.**
None *	0.477333	18.55508	15.49471	0.0167	13.62504	14.26460	0.0629
At most 1	0.209242	4.930033	3.841466	0.0264	4.930033	3.841466	0.0264

Trace test and indicates 1 cointegrating eqn(s) at the 0.05 level Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Ho : Real Exports and Real GDP are correlated.

Table 4.14 describes the Johansen Co-integration Test. Co-integration test checks the presence of long run relationship between export of selected commodities and GDP. The output tells us whether there is cointegration and the number of cointegrated vectors. Here one cannot reject the null hypothesis of two cointegrating vectors using the trace test. There are differences between the trace and maximal eigenvalue tests. The latter can be evaluated from the column of eigenvalues provided. The first calculated test value 18.55508 is greater than 15.49471. Also the second test value of 4.930033 is higher than 3.841466. This explains the rejection of null hypothesis. In case of GDP and Export of selected commodities a long run relationship exist**.**

Granger Causality Test on GDP and Export of selected six industries: The results of Pairwise Granger Causality between economic growth (GDP) and export (EX) are

contained in Table 4.15. The results reveal the existence of a bi-directional causality which runs from GDP to EXPORT and vice versa.

The purpose of this test whether export Granger causes GDP. The Granger causality test is based on the following regressions:

$GDP = \sum \alpha i \; Xt\text{-}1 + \sum \beta \; GDP \; t\text{-}1 + \varepsilon t$

$EXPt = \sum \alpha i \; Xt\text{-}1 + \sum \beta \; GDP \; t\text{-}1 + \varepsilon t$

The null hypotheses of the Granger-Causality test are:

H0: $X \neq Y$ (EXPORT does not granger-cause GDP)

H0: $Y \neq X$ (GDP does not granger-cause EXPORT)

Table 4.15 : Granger Causality Test

Null Hypothesis	**Obs**	**F-Statistic**	**Prob.**
GDP does not Granger Cause EXPORT	21	1.94569	0.1752
EXPORT does not Granger Cause GDP		15.4994	0.0002

It is assumed that the disturbances error term are uncorrelated. The null hypothesis is accepted i.e GDP does not Granger Cause EXPORT because in this case probability value is more than 0.05. In second case we the null hypothesis is rejected and conclude that EXPORTS Granger Cause GDP.

Industrial development plays a significant role in the economic growth of a country. In an advanced stage of industrial sector of an economy, the composition of output undergoes change in the favour of capital goods which generally are capital intensive and come under large and medium category.

Problems faced by and Suggestions given by Industrialists from Punjab:

No doubt, Sports good industry contributes in the development but now the scenario had been changed and the manufacturing units were shifted due to deficiency of labour. Punjab exporters of sport goods industry imports the sport goods from china at cheap rate and exports the same products to other nations.

"Manufacturing of sports goods is dying". Shops are growing since people are shifting to trading from manufacturing due to deficiency of labour. Football manufacturing, which makes available an expected 75,000 jobs in the state till some years ago, has moved out to Pakistan in a big way, and much of the rest to China. In fact, 90 per cent of gymnasium goods sold in India are manufactured in China. Export of sports goods from India is pegged at Rs 1,500 crore and local sales at Rs 5,000 crore".

Some state Government given the tax incentive to medium and small scale industries due to this the Punjab industrial unit shifted to other states of India.

"274 industrial units have shifted out of Punjab to other states with superior facilities and tax structures among 2004 and 2010. The expected investment that has been impacted because of the rearrangement is Rs 3,674 crore. In terms of central excise collection, Punjab's kitty has dropped from Rs. 2,786 crore in 2003-04 to Rs 729 crore in 2008-09.

Distance from ports and closeness to the border with Pakistan are the big reasons for Punjab remaining confined to small and medium industry. Tax incentive packages given to neighbouring states like Jammu and Kashmir, Himachal Pradesh and Uttarakhand, play a significant role".

The major hurdle for Punjab industrialists were the lack of ports and huge distance from Punjab to available ports in India.

"The distance of ports is 2000-3000 km distance from Punjab is the major hurdle for industry to situate here. It is the responsibility of the Chinese government to transport goods from manufacturing hubs to ports."

Due to global economic slowdown the hosiery and textile market exports and productivity decline. Tirupur was the main exporter of hosiery after the Ludhiana.

"It is a good idea to have the similar government at the Centre and the state of Punjab, which has seen just a 7 per cent increase in gross state domestic product (GSDP) in the past seven years to touch Rs 164,525 crore in 2012-13. Presently, Ludhiana exports are at around Rs 1,200 crore and Tirupur at Rs 14,000 crore after its numbers fell from

Rs 19,000 crore due to the global economic slowdown. Ludhiana is expected to generate domestic business of Rs 10,000 crore".

The Chinese government has lowered the minimum bid price for cotton in auctions by 750 yuan, to 18000 yuan per tonne. Indian exporters panic that this impacts their business and narrow the export markets in international level. The another problem faced by the Indian and Punjab exporters was fluctuations in rupees in international exchange market which further lead to decline in exports.

"There is increasing anxiety in the industry due to recent developments in China's cotton policy, as that country is a major importer of cotton and cotton yarn from India."

"The current fiscal year will be challenging. We were alive due to rupee depreciation, which helped us be competitive in the export market. Exports to China helped prevent a glut in the Indian market. This kind of profit may not be sustainable now."

"Exports of cotton yarn to China almost doubled last year, and that has driven profitability. India, Pakistan and Vietnam are major beneficiaries. Depreciation of the rupee had helped Indian exporters. The industry had stocks that were bought at a time when the currency was stronger."

Indian exporter has to take the benefit from the problem which is faced in China i.e. high cost of labour and lack of skilled labour.

"The availability and cost of labour is also becoming an issue in China. We must take advantage of this situation. As exporters, we must be allowed to hire temporary labour. Garment exporters cannot survive on permanent labour, since demand is highly volatile."

To improve the exports in Punjab there are need to revise the tax system incurred on industrial goods and the raw material used for industries production.

"The state government should bring VAT on auto parts from 12 per cent to 4 per cent and on bicycle parts from 6 per cent to 2.5 per cent. This move will give fresh lease of life to these sectors".

"As per our assessment, VAT refund to the tune of Rs 250 crore to Rs 300 crore is still pending with the department for disbursement. The supply of our cotton to other states has come to a standstill as the state government is not refunding the difference between VAT (4.95 per cent) and Central Sales Tax (2 per cent) on account of inter-state sales."

The industrialists also want the state government to bring downward the cost of energy for industrial sector to diminish its input cost.

"Power sector alteration should be initiated by the state government whereby electricity duty on power and cross subsidy should be brought down while free power needs to be rationalized".

The textile sector has sought bringing motor vehicle tax on buses for transporting women workers from rural areas to factory premises on par with school and college buses. Describing poor infrastructure at industrial zones as a hindrance for growth, the industry has demanded more funds to be earmarked for the upkeep and maintenance of focal points and industrial areas.

"There is an urgent need to maintain and upgrade industrial areas and focal points and the state government should address this issue".

SUMMARY

Punjab is a land of boundless opportunity for agriculture as well as industry development. The state has number of small, medium and large-scale industrial units. Major Industries in the state include metals, manufacturing textiles, hosiery, yarn, sports goods, hand tools, bicycles, and light engineering goods. The areas of industrial thrust include agro-industry, electronics, dairy industry, pharmaceutical Industry and white goods industry. There are nearly 194,000 small scale industrial units in the state in addition to 586 large and medium units. Ludhiana is an important centre for industry. The average of total exports of selected industries from 1990-91 to 2001-02 was Rs. 2992 crore. It increased to Rs. 13693 crore during the period 2002-03 to 2013-14. Technology up gradation and improvement in infrastructure was the main cause to increase in the average of total exports from Punjab. Percentage share of exports

increases because industry get R&D benefits and adopt new technology, which save input costs drastically and importing state-of-the-art machinery and the latest technology from Taiwan, especially Cold Forging Technology and Blue Moulding Technology. GDP and Exports had highly positive correlation i.e. 0.953**.** The correlation coefficient between the GDP and EXP was very high and statistically significant at 1 per cent level throughout the study periods. The Augmented Dickey Fuller Unit Root Test was significant on Export with second difference**.** In this case Durbin Watson statistics was 2.26 which means test was reliable (no auto correlation among residuals). ADF was -3.58 which was less than the critical values at 1% level of significance. The series was stationary at second difference. The Augmented Dickey Fuller Unit Root Test on GDP was significant with second difference**.** In this case Durbin Watson statistics was 1.7 which means test was reliable (no auto correlation among residuals). ADF is -4.36 which was less than the critical values at 1%, 5% and 10% level of significance. The series was stationary at second difference. GDP and Export of selected industries has long run relationship**. T**he null hypothesis is accepted i.e GDP does not Granger Cause EXPORT because in this case probability value was more than 0.05. In second case, the null hypothesis is rejected and concludes that EXPORTS Granger Cause GDP. From analysis, the chief findings were that the major sectors which have made significant contribution towards exports from the state were woollen textiles, bicycles and parts, hosiery goods, hand tools, leather products, and sports goods. Technology up gradation and improvement in infrastructure was the main cause of increase in the total exports from Punjab.

CHAPTER – 5

FORECAST AND TRENDS IN EXPORTS FROM PUNJAB SINCE 1990

This chapter, shall dwell on the third and fourth objectives of the study namely:-

"To find out trends in exports from Punjab since 1990 and causes of various trends and to generate forecasts of exports of industrial goods from Punjab up to 2022."

The recent liberalization of the Indian economy has pitch forked Punjab in to the global business mainstream. Heralding this change are more and more entrepreneurs, industrialists and investors with vision, from across the globe. Punjab was determined to achieve a high annual industrial rate of growth during the 1990s. Going by the availability of raw materials and the thrust areas identified by the government for investment opportunities are available for areas such as processing of major and minor crops, industries based on agricultural waste/ residue (wheat/ paddy straw, paddy husk), processing of fruits and vegetables, dairy or poultry based units, leather and sports goods, meat processing, textiles, electronics & telecommunications, information technology, infrastructure modernization and development, automobiles and farm machinery, engineering industries related to agriculture & food processing, including ancillary units, chemical industries, including drugs and pharmaceuticals etc. (Source: Department of Industries & Commerce, Punjab)

5.1 TREND LINES FOR SIX SELECTED INDUSTRIES EXPORTS FROM PUNJAB

Trend lines showed the forecasting of exports from Punjab by using different method such as linear, logarithmic, polynomial, power, exponential and moving average. The method which has highest value of R-squared has a good value of forecast. Forecasting of six selected industries from Punjab by using trend lines are as given below:

1. Readymade garments and hosiery

In Punjab, Ludhiana is the leading player in readymade and hosiery industry. Ludhiana accounts for about 21 per cent of all industrial units and over 28 per cent of the industrial output of the state. The hosiery and garments sector is much more labour intensive, small scale, employing 5-40 workers per unit. Most of the units of this industry are small scale and are located in and operate from residential areas and some large units are based in government promoted industrial estate. The R-squared in case of exponential was 0.9278.

Table 5.1 : Trends and Forecast of Exports of Readymade Garments and Hosiery

Year	Export of Readymade garments and Hosiery from Punjab (Rs Crore)	Trends and forecasting in Exports of Readymade garments and Hosiery from Punjab (Rs Crore)
1990-91	291	196
1991-92	268	224
1992-93	185	256
1993-94	330	293
1994-95	348	335
1995-96	422	383
1996-97	487	438
1997-98	508	501
1998-99	445	573
1999-2000	518	655
2000-01	525	749
2001-02	816	857
2002-03	1261	980
2003-04	1312	1120
2004-05	970	1281

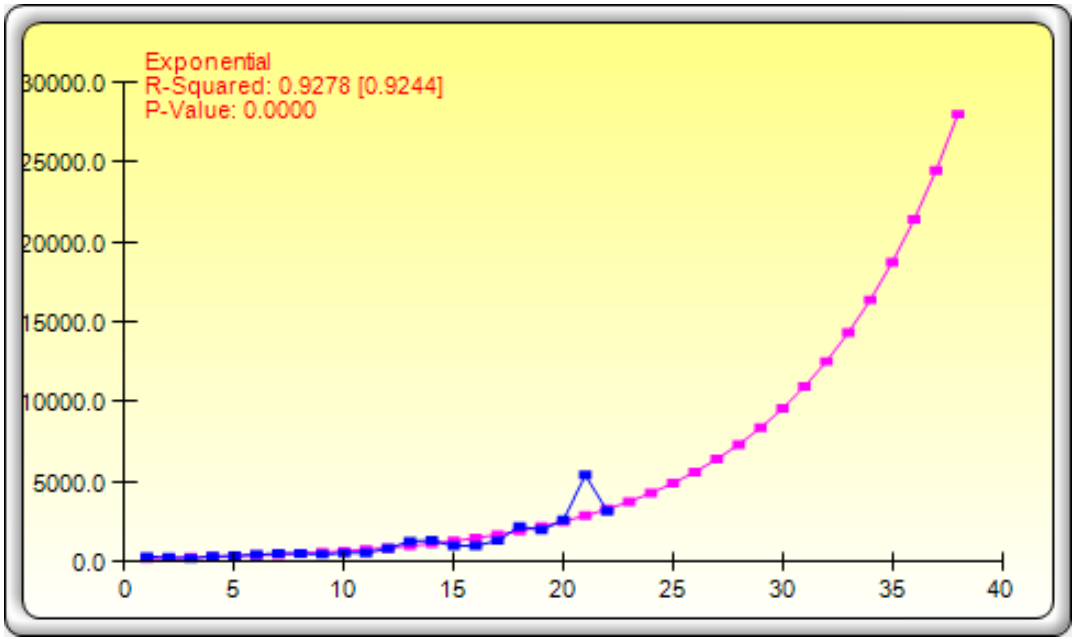
Contd. ….

Year	Export of Readymade garments and Hosiery from Punjab (Rs Crore)	Trends and forecasting in Exports of Readymade garments and Hosiery from Punjab (Rs Crore)
2005-06	985	1465
2006-07	1306	1675
2007-08	2190	1916
2008-09	1977	2191
2009-10	2584	2505
2010-11	5408	2865
2011-12	3143	3276
2012-13	4275	3746
2013-14		4284
2014-15		4898
2015-16		5601
2016-17		6405
2017-18		7324
2018-19		8376
2019-20		9578
2020-21		10952
2021-22		12524
2022-23		14321
2023-24		16377
2024-25		18727
2025-26		21415
2026-27		24488
2027-28		28003

Source: Statistical Abstract of Punjab (Various Issues)

Table no.5.1 depicts the trends and forecast of Punjab readymade garments and hosiery industry. After 2010-11 the actual exports of readymade garments and hosiery declined. The reason for decline was that the exporters from Punjab have to pay far more to export, due to this there is increase in the cost of production i.e. transportation charges as there is no port in Punjab. So the products from Punjab are not in good position to face price competitiveness in the international market.

Figure 5.1 : Trends and Forecast of Exports of Readymade Garments and Hosiery



The R-squared of readymade garments was 0.9278 in case of exponential.

Projections had been made for the readymade garments exports from Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export readymade garments worth Rs. 28002.5650 crore in 2027-28. Thus, based on Punjab's actual exports of readymade garments, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

2. Cycle and cycle parts

India is second largest manufacturer of world in cycle and cycle part industry after China. And Ludhiana is cluster for this industry. The Ludhiana cluster produces about

60 per cent of the total cycles manufactured in the country in the large and small scale sector and more than 80 per cent of the parts and components in the small and tiny sector. The first indigenously owned cycle manufacturing unit in Punjab was Atlas Cycles, established at Sonepat in 1951 in the SSI sector. Hero Cycle Ltd. commenced production of complete cycles in 1956 as an SSI unit in Ludhiana and became the world's largest producer of bicycles in 1989, with a record production of 29,36,076 units and entered the Guinness Book of World Records (Source: Planning Commission, Punjab). The R-squared in case of power was 0.7144.

Table 5.2 : Trends and Forecast of Cycle and Cycle parts

Year	Export of Cycle and Cycle Parts from Punjab (Rs Crore)	Trends and forecasting in Exports of Cycle and cycle parts from Punjab (Rs Crore)
1990-91	66	110
1991-92	171	185
1992-93	296	251
1993-94	518	312
1994-95	401	369
1995-96	436	424
1996-97	706	476
1997-98	890	527
1998-99	462	576
1999-2000	516	623
2000-01	520	670
2001-02	466	716
2002-03	763	760
2003-04	858	804
2004-05	950	847

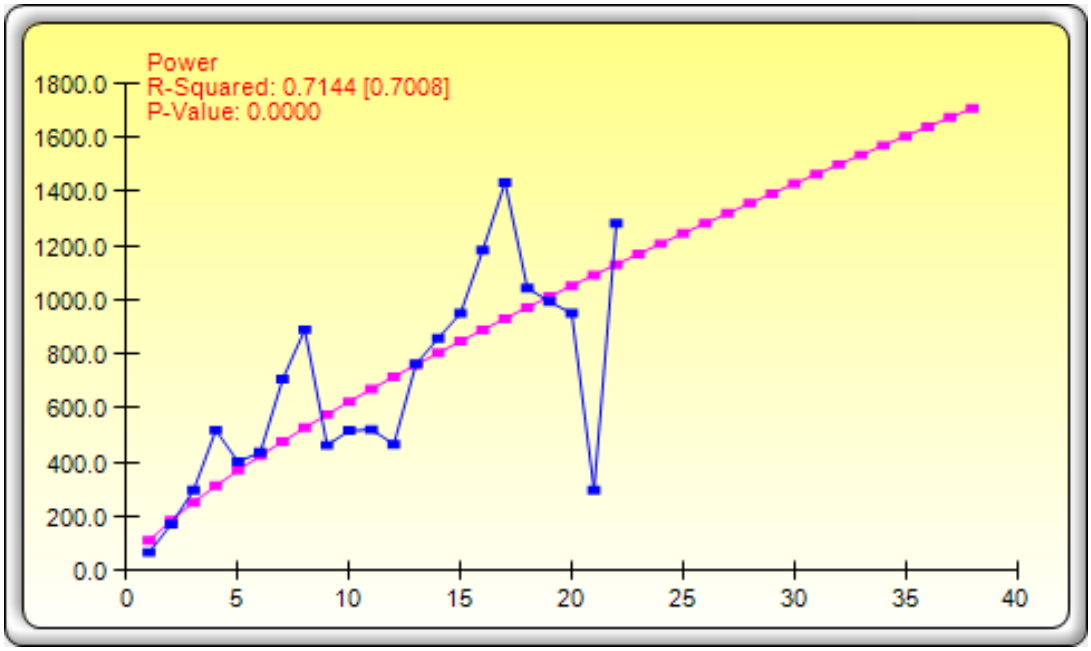
Contd. …

Year	Export of Cycle and Cycle Parts from Punjab (Rs Crore)	Trends and forecasting in Exports of Cycle and cycle parts from Punjab (Rs Crore)
2005-06	1184	889
2006-07	1434	931
2007-08	1044	972
2008-09	993	1012
2009-10	951	1052
2010-11	296	1092
2011-12	1283	1131
2012-13	1579	1169
2013-14		1208
2014-15		1245
2015-16		1283
2016-17		1320
2017-18		1357
2018-19		1393
2019-20		1429
2020-21		1465
2021-22		1501
2022-23		1536
2023-24		1571
2024-25		1606
2025-26		1640
2026-27		1674
2027-28		1708

Source: Statistical Abstract of Punjab (Various Issues)

Table 5.2 depicts the trends and forecast of cycle and cycle parts industry of Punjab. From the year 2008-09 to 2010-11 the exports of cycle and cycle parts industry declined because Punjab imports the cycle parts from China. Every month Punjab dry port receives at least 100 containers of Chinese cycle parts. It badly affects the exports of cycle and cycle parts from Punjab. And another problem faced by cycle industry is continuous rise in price of steel.

Figure 5.2 : Trends and Forecast of Exports of cycle and cycle parts industry



Projections have been made for the cycle and cycle parts exports from Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export cycle and cycle parts worth Rs. 1708.4582 crore in 2027-28. Thus, based on Punjab's actual exports of cycle and cycle parts, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

3. Sports goods

Jalandhar is main cluster for the sports good industry in Punjab. Jalandhar contributes 55-60 per cent of the total sports good exports from India. The sports goods industry in Punjab provides direct employment to about 10,000 workers and indirect employment

to 40,000 workers. The products manufactured include traditional products like footballs, cricket bats, hockey and cricket balls, hockey sticks, tennis, badminton and squash rackets, balls, soft leather goods and shuttlecocks. The R-squared in case of sports good industry exports was highest in case of power that was 0.8774.

Table 5.3 : Trends and Forecast of Exports of Sports good industry

Year	Export of Sports Goods from Punjab (Rs Crore)	Trends and forecasting in Exports of Sports Goods from Punjab (Rs Crore)
1990-91	26	13
1991-92	34	31
1992-93	41	53
1993-94	32	77
1994-95	100	102
1995-96	118	130
1996-97	225	159
1997-98	246	189
1998-99	161	220
1999-2000	193	252
2000-01	204	285
2001-02	274	319
2002-03	285	354
2003-04	396	390
2004-05	366	426
2005-06	471	464
2006-07	563	502

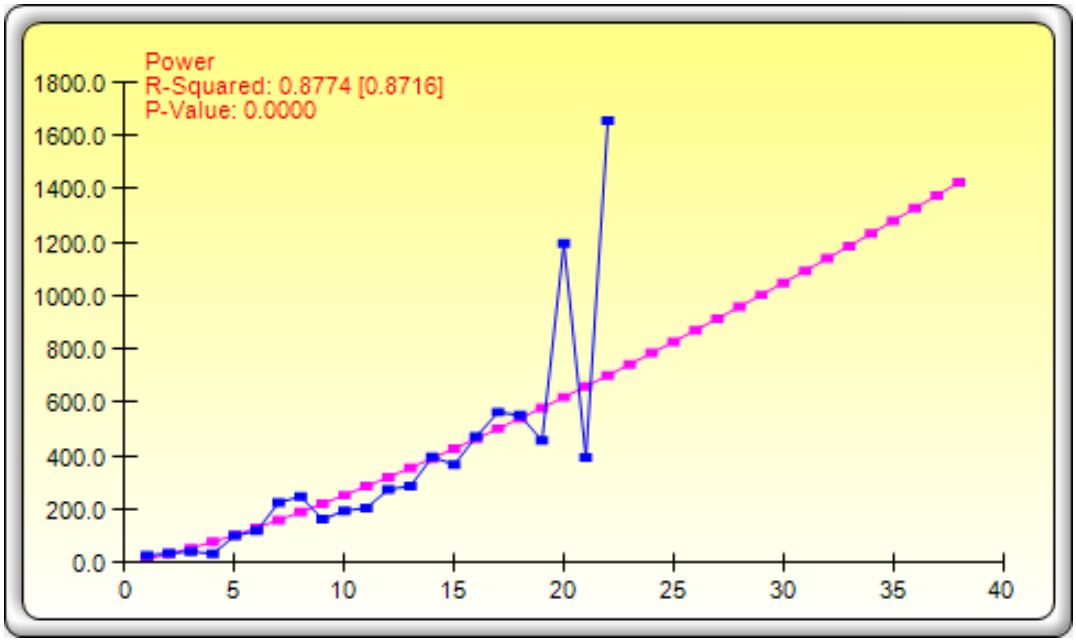
Contd ….

Year	Export of Sports Goods from Punjab (Rs Crore)	Trends and forecasting in Exports of Sports Goods from Punjab (Rs Crore)
2007-08	552	540
2008-09	457	579
2009-10	1196	619
2010-11	393	660
2011-12	1656	701
2012-13	1024	742
2013-14		785
2014-15		827
2015-16		871
2016-17		914
2017-18		958
2018-19		1003
2019-20		1048
2020-21		1094
2021-22		1140
2022-23		1186
2023-24		1233
2024-25		1280
2025-26		1328
2026-27		1376
2027-28		1425

Source: Statistical Abstract of Punjab (Various Issues)

Table 5.3 depicts the trends and forecast of sports good industry of Punjab. Due to the tax burden or unseasonal taxation, lack of raw material, and Chinese good onslaught the exports of sports good from Punjab have declined. And majority of the manufacturers in Jalandhar cater to global players; the slowdown in their countries has affected local manufacturers of sports good industry. In the year 2009-10 the exports of sports good was Rs. 1196 crore and there was a sharp declined noticed in next financial year where the exports were only worth Rs. 393 crore.

Figure 5.3 : Trends and Forecast of Exports of Sports good industry



Projections have been made for the sports good exports from Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export sport goods worth Rs. 1424.7187 crore in 2027-28. Thus, based on Punjab's actual exports of sport goods, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

4. Yarn and Textile

In Punjab Ludhiana district is worldwide famous for yarn and textile industry. In recent years this industry progressed gradually. Till recent years main trading partner for the export of textile and yarn was the USSR. However, after its disintegration, exports have diversified to other markets, viz., Europe, USA and other advanced countries. Production in the textile and yarn industry achieved an impressive average annual growth rate. Abundance of raw material, trained labour, enabling infrastructure, cluster development and an established industrial ecosystem ensure an ideal environment for the booming textile and yarn industry in Punjab. The R-squared was 0.8315 in case of power for exports of yarn and textile.

Table 5.4 : Trends and Forecast of Exports yarn and textile industry

Year	Export of Yarn and Textile from Punjab (Rs Crore)	Trends and forecasting in Exports of Yarn and Textile from Punjab (Rs Crore)
1990-91	29	7
1991-92	19	27
1992-93	19	62
1993-94	36	112
1994-95	72	175
1995-96	165	254
1996-97	656	347
1997-98	831	454
1998-99	862	577
1999-2000	918	714
2000-01	934	866
2001-02	987	1033
2002-03	1572	1214

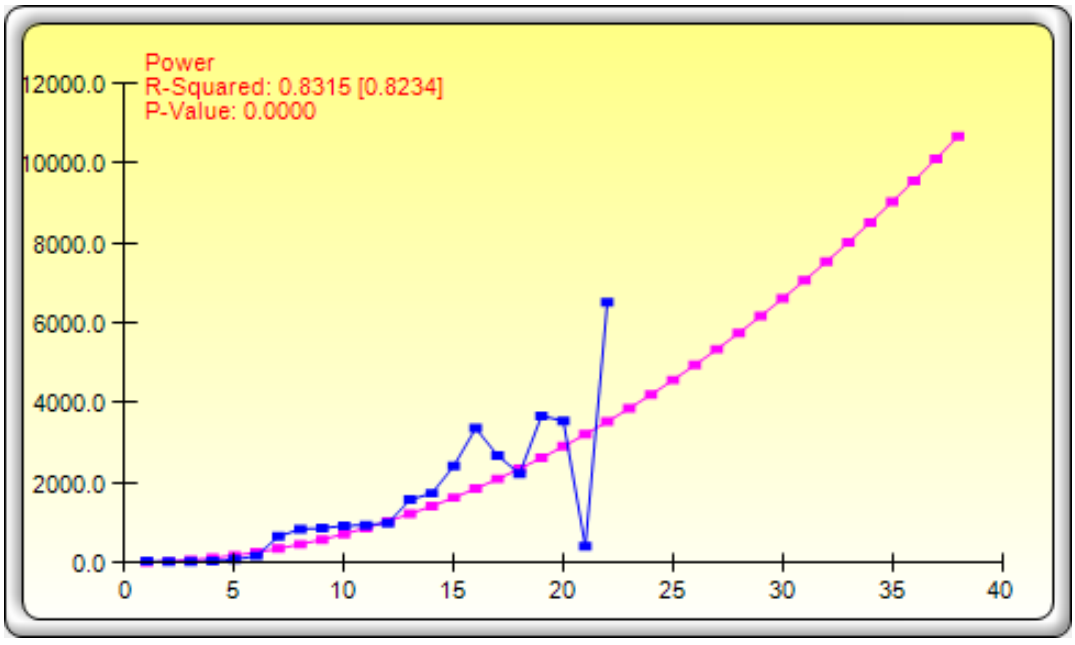
Contd ….

Year	Export of Yarn and Textile from Punjab (Rs Crore)	Trends and forecasting in Exports of Yarn and Textile from Punjab (Rs Crore)
2003-04	1733	1411
2004-05	2418	1623
2005-06	3362	1850
2006-07	2676	2091
2007-08	2223	2348
2008-09	3673	2620
2009-10	3545	2907
2010-11	400	3209
2011-12	6520	3526
2012-13	3460	3858
2013-14		4205
2014-15		4568
2015-16		4946
2016-17		5339
2017-18		5747
2018-19		6171
2019-20		6609
2020-21		7063
2021-22		7532
2022-23		8017
2023-24		8517
2024-25		9032
2025-26		9562
2026-27		9866
2027-28		10257

Source: Statistical Abstract of Punjab (Various Issues)

Table 5.4 depicts the trends and forecast of yarn and textile industry of Punjab. The textile industry in Punjab is passing through the most tough and difficult phase in recent times. The Textile industry in Punjab suffered from US economic recession, due to this the cotton price increased by 40 per cent, high interest rates is facing closure. In 2010-11 the exports of yarn and textile from Punjab was only Rs. 400 crore, which badly affected the overall exports of Punjab. The taxes and levies in the state are much higher than other states. With induction of entry tax on cotton, the Punjab Textiles Industry became more incompetitive. Because Punjab is far from sea ports the logistic costs add burden to the Industry. To overcome this problem Punjab government introduce subsidy on freight. The government has also withdrawn interest subsidy on exports and with input cost like fuel, power, and transportation. With the introduction of high taxes on textile industry in Punjab, textiles industry becomes more uncompetitive. The Punjab industry is also facing power shortage

Figure 5.4 : Trends and Forecast of Exports of yarn and textile industry



Projections have been made for the yarn and textile exports from Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export yarn and textile worth Rs. 10256.8712 crore in 2027-28. Thus, based on Punjab's actual exports of yarn and textile, there exists a scope for her exports in future.

Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

5. Leather goods

Jalandhar is the main cluster of leather industry in Punjab. Items produced by this sector include, bags, handbags, hand gloves and industrial gloves, wallets, ruck sacks, folios, brief cases, travelware, belts, sports goods, upholstery and saddlery goods. The main importers of leather goods are USA, European Union, Africa, Hong Kong, Australia. In case of leather goods polynomial R-Squared was highest, that was 0.5928.

Table 5.5 : Trends and Forecast of Exports of leather goods industry

Year	Export of Leather Goods from Punjab (Rs Crore)	Trends and forecasting in Exports of Leather Goods from Punjab (Rs Crore)
1990-91	30	32
1991-92	30	37
1992-93	40	43
1993-94	47	49
1994-95	59	55
1995-96	53	62
1996-97	79	69
1997-98	104	77
1998-99	83	85
1999-2000	114	94
2000-01	18	103
2001-02	206	112
2002-03	130	122
2003-04	66	133
2004-05	191	144

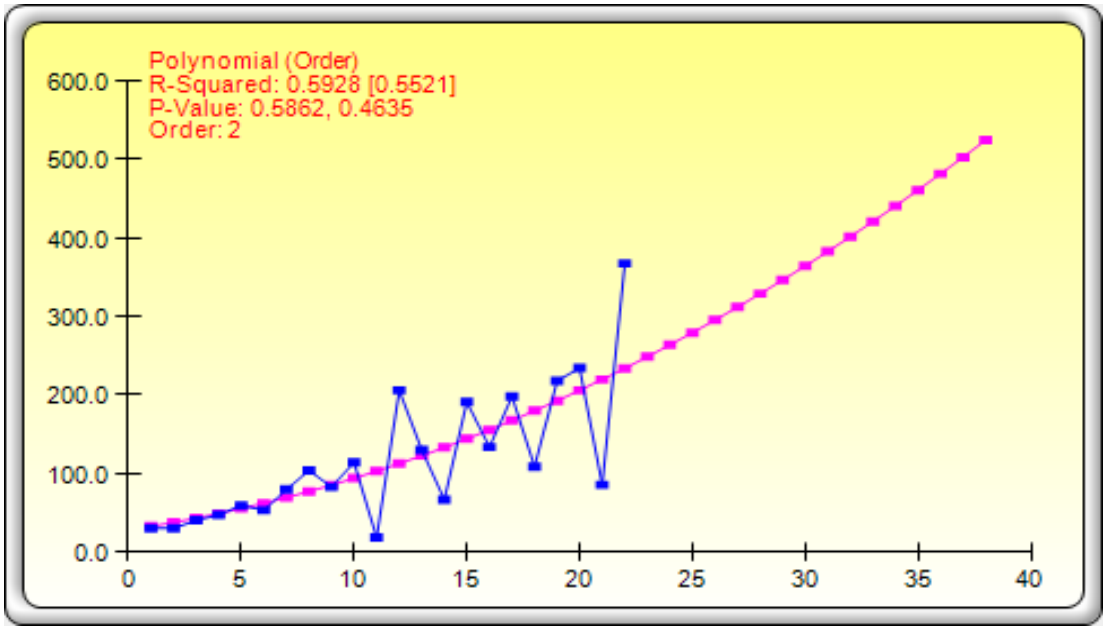
Contd …..

Year	Export of Leather Goods from Punjab (Rs Crore)	Trends and forecasting in Exports of Leather Goods from Punjab (Rs Crore)
2005-06	133	155
2006-07	198	167
2007-08	108	180
2008-09	218	192
2009-10	234	206
2010-11	85	220
2011-12	367	234
2012-13	226	248
2013-14		264
2014-15		279
2015-16		295
2016-17		312
2017-18		329
2018-19		346
2019-20		364
2020-21		383
2021-22		402
2022-23		421
2023-24		441
2024-25		461
2025-26		482
2026-27		503
2027-28		524

Source: Statistical Abstract of Punjab (Various Issues)

Table 5.5 depicts the trends and forecast of leather goods from Punjab. With global economic slowdown, leather industry Punjab faces a problem. Punjab leather industry is facing a major downturn. There was sharp decline in the export and domestic consumption. Due to this in 2000-01 the exports of leather goods was Rs. 18 crore only and Rs. 85 crore in 2010-11. To promote the leather industry in Punjab, Punjab government reduced import duty on leather industry. Lack of quality raw material and two-and-a-half-day power cuts are also a problem for leather industry in Punjab. Another problem faced by leather industry is prices of finished goods are not moving up in sync with the raw material prices. Cost of raw leather sheet has increased by Rs.5 per square feet and prices of chemicals have gone up by about 10 percent and further 10 percent rise is expected in near future.

Figure 5.5 : Trends and Forecast of Exports of leather goods industry



Projections have been made for the leather goods exports from Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export leather goods worth Rs. 524.4899 crore in 2027-28. Thus, based on Punjab's actual exports of leather goods, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

6. Hand tools/machine tools

The hand tools industry is concentrated in Jalandhar and Ludhiana. The use of hand tools covers almost all types of industries, viz., engineering, electrical and electronics, construction, plumbing, etc. Absence of these tools would in fact paralyse every type of industrial activity. Hand tools most commonly used in industries are wrenches, hand drills, pullers, vices, hammers, screwdrivers, pliers, spanners, clamps, cramps, etc. Such hand tools, as flaring tools, pullers, ring expanders and compressors, screw and stud extractors, tyre valve pull-out tools, flanging tools, valve lifters and reseating tools etc., are extensively used in automobile repair workshops and garages. They also have important applications in the household sector in day to day life. (Source: Planning Commission, Punjab) The R-squared is highest in case of power was 0.7374 in case hand tools/machines.

Table 5.6 : Trends and Forecast of Exports of Hand tools/ machines industry

Year	Export of Leather Goods from Punjab (Rs Crore)	Trends and forecasting in Exports of Leather Goods from Punjab (Rs Crore)
1990-91	20	7
1991-92	18	21
1992-93	19	39
1993-94	28	61
1994-95	53	85
1995-96	58	113
1996-97	44	143
1997-98	352	176
1998-99	300	211
1999-2000	350	248
2000-01	321	288
2001-02	437	329
2002-03	417	372

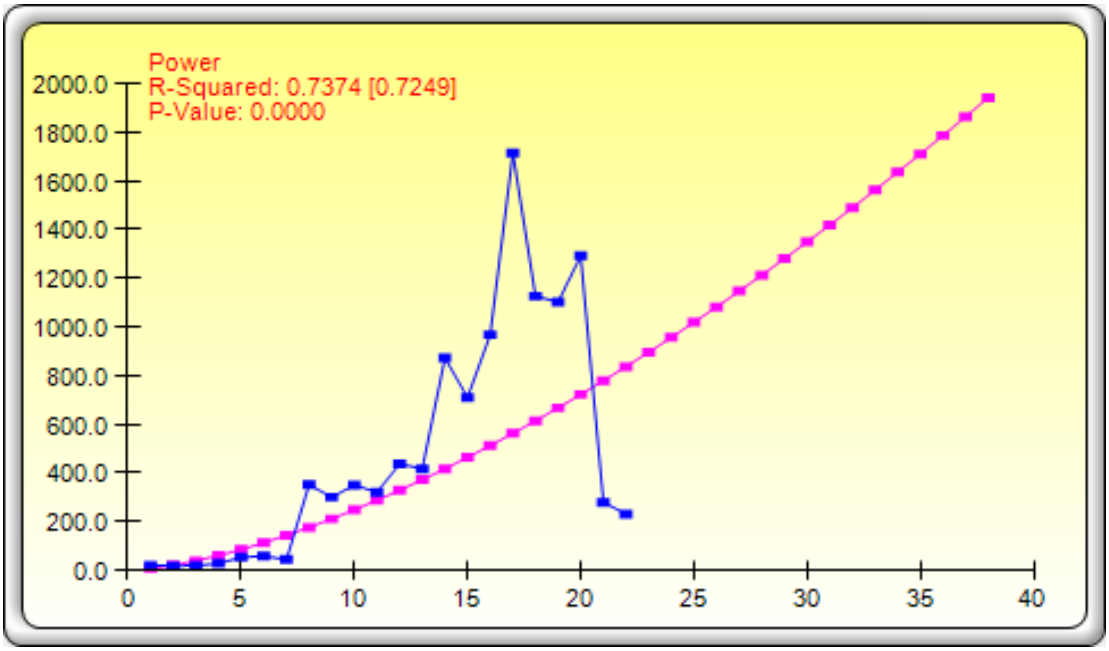
Contd. …

Year	Export of Leather Goods from Punjab (Rs Crore)	Trends and forecasting in Exports of Leather Goods from Punjab (Rs Crore)
2003-04	872	417
2004-05	710	464
2005-06	968	512
2006-07	1715	562
2007-08	1126	614
2008-09	1102	668
2009-10	1292	722
2010-11	279	779
2011-12	231	837
2012-13	255	896
2013-14		957
2014-15		1019
2015-16		1082
2016-17		1147
2017-18		1213
2018-19		1280
2019-20		1349
2020-21		1419
2021-22		1490
2022-23		1562
2023-24		1636
2024-25		1711
2025-26		1787
2026-27		1864
2027-28		1942

Source: Statistical Abstract of Punjab (Various Issues)

Table 5.6 depicts the trends and forecast of hand tool/machines industry of Punjab. The problem generally faced by the exporters of hand tool items is sometime absence of buyers. Form 2010-11 onward the exports of hand tools/ machines declined due to lack of technology. Industrialist should adopt R&D benefits and adopt new technology, which save input costs drastically and importing state-of-the-art machinery and the latest technology from Taiwan, especially Cold Forging Technology and Blue Moulding Technology.

Figure 5.6: Trends and Forecast of Exports of hand tool/machine industry



Projections have been made for the hand tools/machines exports from Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export hand tools/machines worth Rs. 1941.7155 crore in 2027-28. Thus, based on Punjab's actual exports of hand tools/machines, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

5.2 CAUSES OF TRENDS

Punjab has not been able to achieve faster growth of industries in the state. This slow pace of industrial exports. There are certain reasons that why the exporters of Punjab/India is not in a good position in the world trade which are as follows:

1. Main problem faced by an exporter from Punjab is of the infrastructure. Roads and railways are main sources of transportation. A container takes 10 to 15 days to reach Mumbai, which consumes more time, which may cause in delays of deliveries, again the exporters may lose their confidences in the international markets.
2. Small scale industries do not have better technology. They are not capable of mass production, which is also a loophole.
3. One major problem is related to electricity. One industrialist cannot run industry for more than 6 hours a day.
4. Role of state government is nil, there is inadequate or no support for the industry.
5. Child labour is another major cause. Sports goods industry uses child labour directly or indirectly. Sports goods industry has received ultimatum previously by the foreign countries because of the involvement of child labour in the industry. Child labour is strictly restricted in WTO.
6. According to WTO rules if there is no work there is no labour. But this rule is not applicable here because of labour unions.
7. Products exported from Punjab are no longer competitive.
8. In terms of transportation one can provide subsidy to its exporters, but no imitative is being taken by the Punjab Government to get this export subsidy on transportation due to some political reasons.
9. The state of Punjab is poor in case of natural resources. The soil and climate suits agriculture. There is a need of minerals for the production process. But these are not available in Punjab. Several minerals are imported from other states and countries. This takes a long time for industrial processing. There is a

withdrawal of the freight equalization scheme of the central government that has put extra burden on exporters of Punjab and discourages the exporters.

10. Another major reason is the political instability and militancy in Punjab. Several exporters and industries migrated during militancy period from Punjab to other states.

There are many reasons for the slow growth of Punjab's exports. Majority of the export firms from Punjab are one man shows, their capital bases are poor and they do not have access to economies of scale. The international organizations are likely to create some far reaching implications of these exporters in Punjab, specifically with regard to their competitive ability and integration with global markets.

These industries continue to be the main foreign exchange earner for the country and have played a pivotal role in balancing India's balance of trade. However for the last 4 to 5 years, these industries have been passing through a very difficult period. The general economic slowdown in the US and other economies of the world continued in the year 2002, 2009 and thus affected the performance of these industries. The global competition and stagnation has pushed the product prices to such an extent that maintaining a reasonable performance has become a great challenge. The serve squeezes on the margins are affecting efforts as well as profitability of these industries. The entry of China into WTO, has the major impact on these industries. China is a great challenge for the domestic producers. These industries are basically labour intensive industries. Due to the competition in the global market and for the survival in the international market, these industries require zero MFN tariffs in the developed countries on labour intensive goods. But developed countries continue to maintain high tariffs on labour intensive goods to protect their domestic industries. The high domestic support, export subsidies and denial of market access through various tariff and non tariff barriers in the developed countries, have resulted a fall in global industrial commodity prices in the post globalization period. International quality standards are very difficult to be maintained by exporters from Punjab in the globalization regime. In more recent years there has been a decline in garment exports from the country and from the region. Such exports have been constrained by extensive protection of

domestic textile and clothing industries by industrialized countries through import quotas imposed under the Multifiber Arrangement (MFA). The large number of people employed in the textile and clothing sector in these countries has meant that quotas could continue for many decades despite recognition of the inefficiency of such protection. The threats of WTO on industry are cost competitiveness, competition from China, Indonesia etc., import licensing procedure, environmental threats etc.

Like a coin has two sides in the same way, WTO has two aspects one is good and other is bad. We have analyzed the bad impact of the WTO above. There are certain ample opportunities through WTO for the ambitious young exporters, entrepreneurs, industrialist etc. The aim is to pave the way for greater market access for all member countries by slashing the import duties on thousands of industrial goods. The agreement on textile and clothing was given a full structure. The USA has reluctantly agreed to phase out the import quotas on the Third World textiles and clothing over 10 years from 1995 in place of quota system. Agreement on Anti dumping have been subjected to Measures Disciplines. Agreement on Trade Related Investment Measures (TRIMS) has also been incorporated. The idea is to open up foreign and international investment across national barriers among nations.

Most Favored Nation Treatment (MFN) provides equal treatment to all member countries. Any trade concession offered to one member country must be offered to all their member countries. Imported goods share should not be discriminated against in favor of the domestic goods. Some treatment must be accorded to goods imported from outside the country. This would reduce barriers to trade

5.3 METHODOLOGY FOR TOTAL EXPORTS OF SELECTED INDUSTRIES FROM PUNJAB BY USING ARIMA

Export performance of six selected industries from Punjab Moving Average structure as explained by ARIMA models. Punjab's export of industrial goods will be modeled as ARIMA process. Identification of the values of parameters p,d and q is done on basis of ACF and PACF analysis. Data analyzed in the study is yearly exports from Punjab in Crore Rupees from 1990-91 till 2012-13. Data from 1990-91 till 2012-13 is used to

train the structural models while next 15 years data is used to test the accuracy of the model forecast. Table (1) describes the data used in the analysis. First and foremost step before fitting the model is making the time series stationary. If time series is not stationary then it has to be transformed to make it stationary. Generally time series is differenced to make it stationary. Plots of ACF and LBQ test statistics will be used to check the stationarity of the model.

Table 5.7 : AUTO-ARIMA (Autoregressive Integrated Moving Average)

Models	Adjusted R-Squared	Akaike Information Criterion (AIC)	Schwarz Criterion (SC)	Durbin-Watson Statistic (DW)	Number of Iterations	Model Rank
P=2, D=0, Q=0	0.8786	16.1387	16.5736	2.4238	0	1
P=2, D=2, Q=0	0.8588	16.0043	16.4692	2.0095	0	2
P=1, D=0, Q=0	0.7744	17.6488	17.9298	3.0016	0	3
P=2, D=1, Q=1	0.5490	16.7960	17.3951	1.6970	13	4
P=0, D=0, Q=2	0.5445	17.5281	17.9371	1.3456	36	5
P=2, D=1, Q=0	0.5260	16.9062	17.3555	1.6734	0	6
P=1, D=1, Q=1	0.4717	16.1667	16.6016	2.0021	25	7
P=1, D=1, Q=0	0.4622	16.2351	16.5251	2.2399	0	8
P=0, D=1, Q=1	0.4127	17.0936	17.3746	2.4532	23	9
P=0, D=2, Q=0	0.0000	17.9711	18.1160	2.9144	0	10
P=0, D=1, Q=0	0.0000	17.6746	17.8151	3.1582	0	11

Table 5.8 : Regression Statistics

R-Squared (Coefficient of Determination)	0.8908	Akaike Information Criterion (AIC)	16.1387
Adjusted R-Squared	0.8786	Schwarz Criterion (SC)	16.5736
Multiple R (Multiple Correlation Coefficient)	0.9438	Log Likelihood	-169.46
Standard Error of the Estimates (SEy)	3588.51	Durbin-Watson (DW) Statistic	2.4238
Number of Observations	21	Number of Iterations	0

Table 5.9 : Regression Results

	Intercept	**AR(1)**	**AR(2)**
Coefficients	435.1838	0.2311	0.9003
Standard Error	470.6370	0.1728	0.2026
t-Statistic	0.9247	1.3372	4.4433
p-Value	0.3674	**0.1978**	**0.0003**
Lower 5%	1251.2983	0.5308	1.2516
Upper 95%	-380.9306	-0.0686	0.5489

Table 5.10 : Analysis of Variance

	Sums of Squares	**Mean of Squares**	**F-Statistic**	**p-Value**	**Hypothesis Test**	
Regression	229419320.1	114709660	73.41	**0.0000**	Critical F-statistic (99% confidence with df of 2 and 18)	6.0129
Residual	28128375.02	1562687.5			Critical F-statistic (95% confidence with df of 2 and 18)	3.5546
Total	257547695.1				Critical F-statistic (90% confidence with df of 2 and18)	2.6239

Table 5.11 : Autocorrelation

Time Lag	AC	PAC	Lower Bound	Upper Bound	Q-Stat	Prob
1	0.7944	0.7944	(0.4170)	0.4170	15.2406	0.0001
2	0.6531	0.0598	(0.4170)	0.4170	26.0846	0.0000
3	0.5976	0.1693	(0.4170)	0.4170	35.6661	0.0000
4	0.4463	(0.2378)	(0.4170)	0.4170	41.3256	0.0000
5	0.3415	0.0234	(0.4170)	0.4170	44.8455	0.0000
6	0.2500	(0.1045)	(0.4170)	0.4170	46.8586	0.0000
7	0.1217	(0.0971)	(0.4170)	0.4170	47.3699	0.0000
8	0.0219	(0.0790)	(0.4170)	0.4170	47.3877	0.0000
9	(0.0646)	(0.0652)	(0.4170)	0.4170	47.5557	0.0000
10	(0.1638)	(0.0934)	(0.4170)	0.4170	48.7336	0.0000
11	(0.2549)	(0.1116)	(0.4170)	0.4170	51.8718	0.0000
12	(0.3003)	0.0057	(0.4170)	0.4170	56.7114	0.0000
13	(0.3365)	(0.0320)	(0.4170)	0.4170	63.5474	0.0000
14	(0.3467)	0.0391	(0.4170)	0.4170	71.8435	0.0000
15	(0.3578)	(0.0830)	(0.4170)	0.4170	82.1479	0.0000
16	(0.3744)	(0.0534)	(0.4170)	0.4170	95.6863	0.0000
17	(0.3630)	(0.0358)	(0.4170)	0.4170	111.6007	0.0000
18	(0.3371)	(0.0052)	(0.4170)	0.4170	129.8930	0.0000
19	(0.2976)	0.0201	(0.4170)	0.4170	151.2847	-
20	(0.2350)	0.0388	(0.4170)	0.4170	177.9657	-

Figure 5.7 : Auto correlation and partial auto correlation

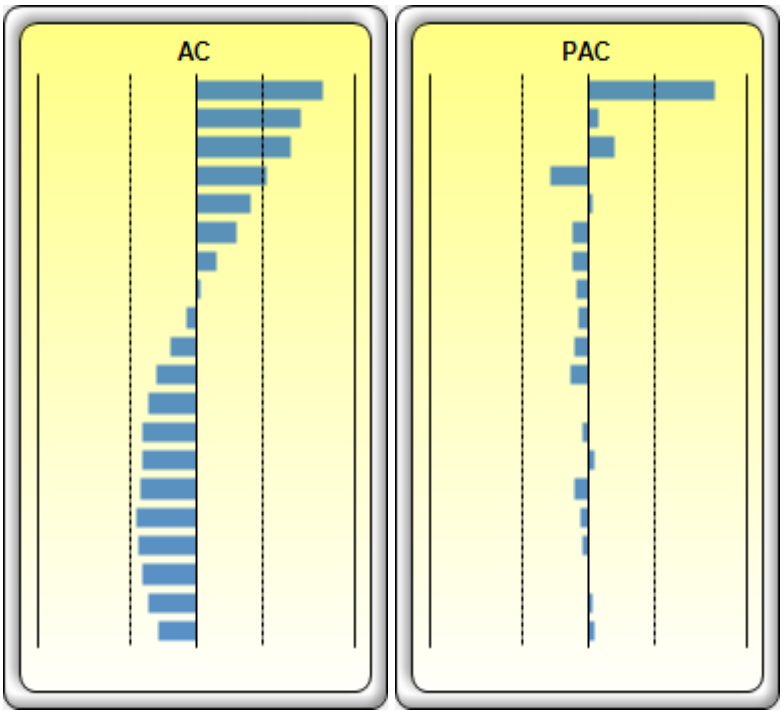


Figure 5.8 : Comparison of actual and forecasted Exports

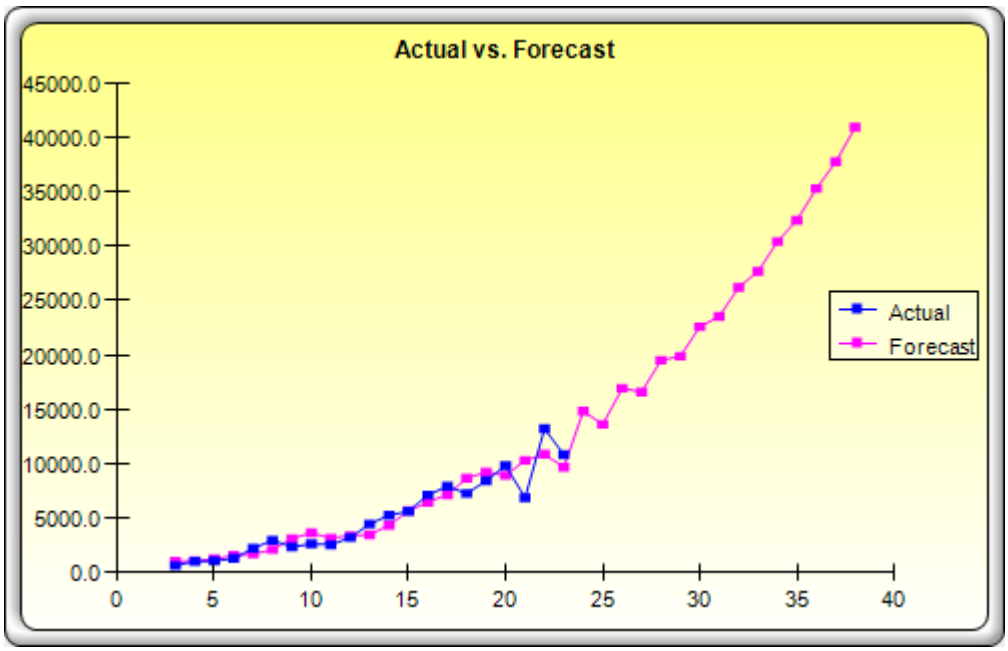


Figure 5.9 : Predictor error.

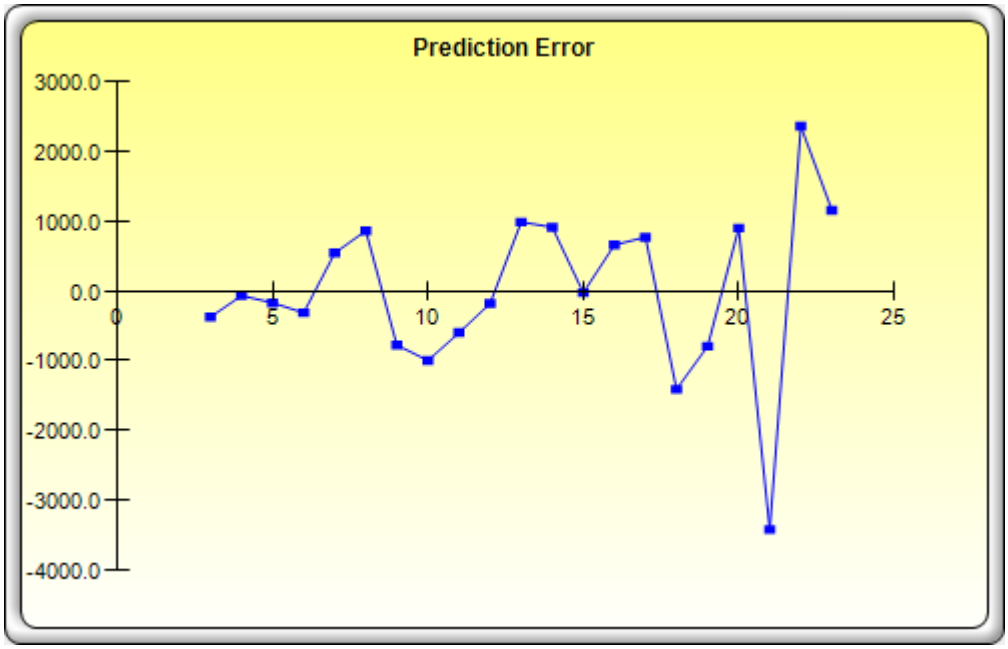


Table 5.12 : Projections and trends of six selected industries exports of Punjab at current prices on the basis of their actual performance during 1990-91 to 2012-13

Year	Actual (Y)	Forecast (F)
1992-93	600	976
1993-94	991	1060
1994-95	1033	1204
1995-96	1252	1566
1996-97	2197	1655
1997-98	2930	2070
1998-99	2314	3090
1999-2000	2610	3608
2000-01	2522	3122
2001-02	3185	3368

Contd. ….

Year	Actual (Y)	Forecast (F)
2002-03	4427	3442
2003-04	5238	4326
2004-05	5606	5631
2005-06	7104	6446
2006-07	7892	7123
2007-08	7244	8654
2008-09	8421	9214
2009-10	9801	8902
2010-11	6862	10281
2011-12	13201	10845
2012-13	10819	9664
2013-14		14820
2014-15		13600
2015-16		16920
2016-17		16589
2017-18		19502
2018-19		19877
2019-20		22586
2020-21		23550
2021-22		26212
2022-23		27694
2023-24		30433
2024-25		32401
2025-26		35322
2026-27		37768
2027-28		40963

Projections have been made for the six selected industries exports of Punjab at current prices on the basis of their actual performance during 1990-91 to 2012-13. Table 5.12 shows these projections. Punjab can export goods worth Rs. 40963 crore in 2027-28. Thus, based on Punjab's actual exports, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

Forecasting and Trends in total exports of Punjab

Moving Average structure as explained by ARIMA models. Punjab's export of industrial goods will be modeled as ARIMA process. Identification of the values of parameters p,d and q is done on basis of ACF and PACF analysis. Data analyzed in the study is yearly exports from Punjab in Crore Rupees from 1991-1992 till 2009-2010. Data from 1990-91 till 2009-10 is used to train the structural models while next 10 years data is used to test the accuracy of the model forecast. Table (5.18) describes the data used in the analysis. First and foremost step before fitting the model is making the time series stationary. If time series is not stationary then it has to be transformed to make it stationary. Generally time series is differenced to make it stationary. Plots of ACF and LBQ test statistics will be used to check the stationarity of the model.

Table 5.13 : AUTO-ARIMA (Autoregressive Integrated Moving Average)

Models	Adjusted R-Squared	Akaike Information Criterion (AIC)	Schwarz Criterion (SC)	Durbin-Watson Statistic (DW)	Number of Iterations	Model Rank
P=1, D=0, Q=0	0.9457	15.7671	16.0771	2.4824	0	1
P=2, D=0, Q=0	0.9408	16.6282	17.1100	2.2465	0	2
P=0, D=0, Q=2	0.8423	17.6791	18.1285	0.3550	32	3
P=2, D=2, Q=0	0.6337	16.4837	17.0035	1.6495	0	4

Contd. …

Models	Adjusted R-Squared	Akaike Information Criterion (AIC)	Schwarz Criterion (SC)	Durbin-Watson Statistic (DW)	Number of Iterations	Model Rank
P=0, D=0, Q=1	0.5715	18.7356	19.0351	0.5412	29	5
P=0, D=2, Q=0	0.0000	17.5143	17.6748	2.8611	0	6
P=0, D=1, Q=0	0.0000	15.8895	16.0445	1.9995	0	7
P=2, D=1, Q=0	-0.0155	15.7450	16.2450	1.5883	0	8
P=0, D=1, Q=1	-0.0532	15.8845	16.1944	1.8398	12	9
P=1, D=1, Q=0	-0.0599	16.8016	17.1228	1.9645	0	10

Table 5.14 : Regression Statistics

R-Squared (Coefficient of Determination)	0.9487	Akaike Information Criterion (AIC)	15.7671
Adjusted R-Squared	0.9457	Schwarz Criterion (SC)	16.0771
Multiple R (Multiple Correlation Coefficient)	0.9740	Log Likelihood	-149.79
Standard Error of the Estimates (SEy)	4512.76	Durbin-Watson (DW) Statistic	2.4824
Number of Observations	19	Number of Iterations	0

Table 5.15 : Regression Results

	Intercept	AR(1)
Coefficients	283.9372	1.0945
Standard Error	414.6082	0.0617
t-Statistic	0.6848	17.7309
p-Value	0.5027	**0.0000**
Lower 5%	1005.1924	1.2019
Upper 95%	-437.3180	0.9871

Table 5.16 : Analysis of Variance

	Sums of Squares	Mean of Squares	F-Statistic	p-Value	Hypothesis Test	
Regression	347764392.9	347764392.9	314.38	**0.0000**	Critical F-statistic (99% confidence with df of 1 and 17)	8.3997
Residual	18805041.67	1106178.92			Critical F-statistic (95% confidence with df of 1 and 17)	4.4513
Total	366569434.5				Critical F-statistic (90% confidence with df of 1 and 17)	3.0262

Table 5.17 : Autocorrelation

Time Lag	AC	PAC	Lower Bound	Upper Bound	Q-Stat	Prob
1	0.7970	0.7970	(0.4472)	0.4472	14.0796	0.0002
2	0.6231	(0.0332)	(0.4472)	0.4472	23.1910	0.0000
3	0.5105	0.0656	(0.4472)	0.4472	29.6905	0.0000
4	0.3424	(0.2122)	(0.4472)	0.4472	32.8098	0.0000
5	0.2154	0.0028	(0.4472)	0.4472	34.1325	0.0000
6	0.1320	(0.0122)	(0.4472)	0.4472	34.6671	0.0000
7	(0.0037)	(0.1815)	(0.4472)	0.4472	34.6676	0.0000
8	(0.1069)	(0.0433)	(0.4472)	0.4472	35.0824	0.0000
9	(0.1545)	0.0012	(0.4472)	0.4472	36.0354	0.0000
10	(0.2020)	(0.0186)	(0.4472)	0.4472	37.8442	0.0000
11	(0.2614)	(0.1220)	(0.4472)	0.4472	41.2517	0.0000
12	(0.3085)	(0.1032)	(0.4472)	0.4472	46.6772	0.0000
13	(0.3492)	(0.0656)	(0.4472)	0.4472	54.7855	0.0000
14	(0.3631)	(0.0112)	(0.4472)	0.4472	65.3050	0.0000
15	(0.3690)	(0.0877)	(0.4472)	0.4472	78.8895	0.0000
16	(0.3455)	0.0067	(0.4472)	0.4472	94.7629	0.0000
17	(0.2919)	0.0397	(0.4472)	0.4472	111.7670	0.0000
18	(0.2328)	0.0176	(0.4472)	0.4472	133.3930	0.0000

Figure 5.10 : Auto correlation and partial auto correlation.

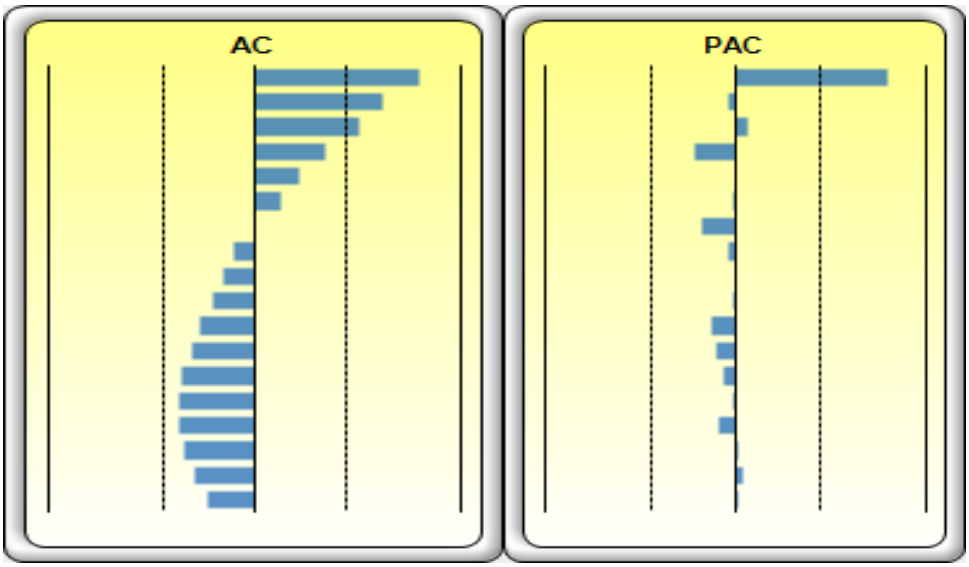


Table 5.18 : Projections of Total Exports from Punjab

S.No	Year	Exports (Rs. Crore)	Forecasted Value of Exports (Rs Crore)
1	1991-92	901	1126
2	1992-93	1215	1270
3	1993-94	1815	1614
4	1994-95	2082	2270
5	1995-96	2565	2563
6	1996-97	3641	3091
7	1997-98	4205	4269
8	1998-99	3629	4886
9	1999-2000	4063	4256
10	2000-01	4015	4731
11	2001-02	4408	4678
12	2002-03	7014	5109

Contd. ….

S.No	Year	Exports (Rs. Crore)	Forecasted Value of Exports (Rs Crore)
13	2003-04	8933	7961
14	2004-05	7914	10061
15	2005-06	9656	8946
16	2006-07	11798	10853
17	2007-08	11267	13197
18	2008-09	13888	12616
19	2009-10	15972	15485
20	2011-12		17765
21	2012-13		19728
22	2013-14		21877
23	2014-15		24229
24	2015-16		26802
25	2016-17		29619
26	2017-18		32703
27	2018-19		36077
28	2019-20		39771
29	2020-21		43814

Source: Govt. of Punjab, Statistical Abstract of Punjab, (various issues)

Figure 5.11 : Comparison of actual and forecasted Exports

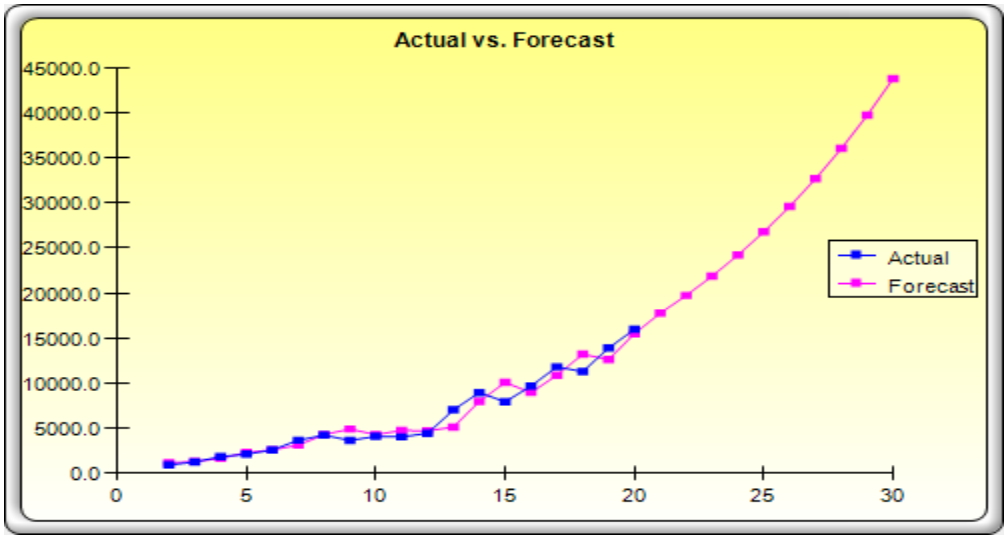
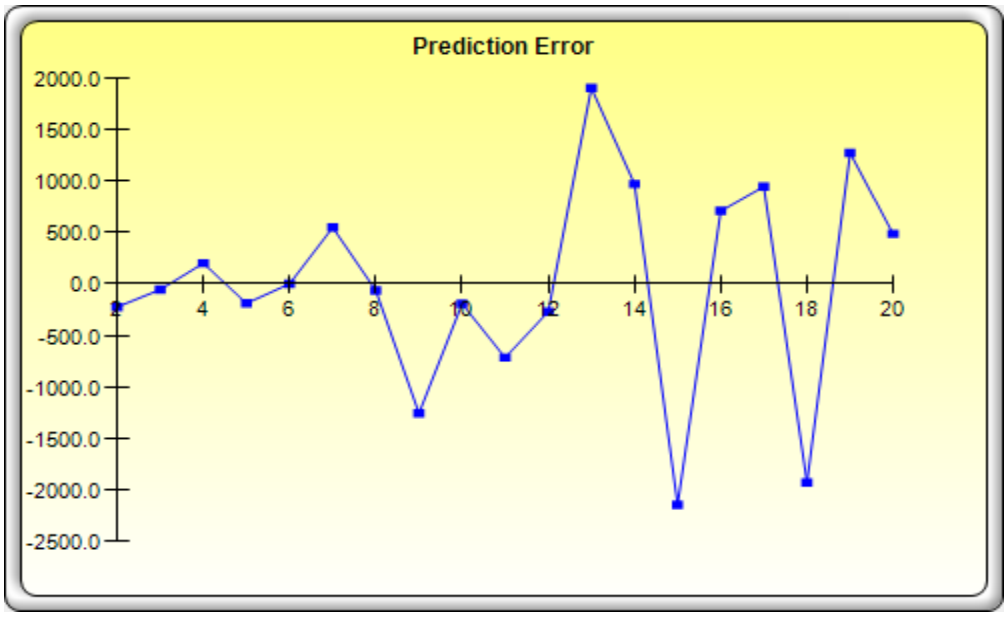


Figure 5.12 : Predictor error



Projections have been made for the industrial exports of Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Table 5.18 shows these projections. Punjab can export goods worth Rupees 43814 crore in 2020-21. Thus, based on Punjab's actual exports, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

SUMMARY

Punjab is on its way to rapid industrialization through coordinated development of small, medium and large scale industries. Industrial sector of Punjab plays a significant role in the development of state. Ludhiana leads in industrialization, accounting for more than 35 per cent of the industrial output, 23 per cent of industrial units and 33 per cent of industrial workforce of Punjab Ludhiana is leading player in readymade and hosiery industry. Ludhiana accounts for about 21 per cent of all industrial units and over 28 per cent of the industrial output of the State. The hosiery and garments sector is much more labour intensive, small scale, employing 5-40 workers per unit. The Ludhiana cluster produces about 60 per cent of the total cycles manufactured in the country in the large and small scale sector and more than 80 per cent of the parts and

components in the small and tiny sector. Hero Cycle Ltd. commenced production of complete cycles in 1956 as an SSI unit in Ludhiana and became the world's largest producer of bicycles in 1989, with a record production of 29,36,076 units and entered the Guinness Book of World Records. Jalandhar was main cluster for the sports good industry in Punjab. Jalandhar contributes 55-60 per cent of the total sports good exports from India. The sports goods industry in Punjab provides direct employment to about 10,000 workers and indirect employment to 40,000 workers. Ludhiana district was worldwide famous for yarn and textile industry. In recent years this industry progressed gradually. Till recent years main trading partner for the export of textile and yarn was the USSR. However, after its disintegration, exports have diversified to other markets, viz., Europe, USA and other advanced countries. Production in the textile and yarn industry achieved an impressive average annual growth rate. Abundance of raw material, trained labour, enabling infrastructure, cluster development and an established industrial ecosystem ensure an ideal environment for the booming textile and yarn industry in Punjab. Jalandhar was the main cluster of leather industry in Punjab. Items produced by this sector include, bags, handbags, hand gloves and industrial gloves, wallets, ruck sacks, folios, brief cases, travelware, belts, sports goods, upholstery and saddlery goods. The main importers of leather goods are USA, European Union, Africa, Hong Kong, Australia. The hand tools industry was concentrated in Jalandhar and Ludhiana. The use of hand tools covers almost all types of industries, viz., engineering, electrical and electronics, construction, plumbing, etc. Absence of these tools would in fact paralyse every type of industrial activity. Unavailability of major raw material such as iron or coal, was a definite hindrance for the establishment of large and medium scale units in Punjab. Punjab Government stepped in to help make large & medium scale production profitable in Punjab. Punjab has not been able to achieve faster growth of industries in the state because of Unavailability of major raw material. Projections have been made for the industrial exports of Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export goods worth Rs. 43814 crore in 2020-21. Thus, based on Punjab's actual exports, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

CHAPTER – 6

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 SUMMARY

In this study exports performance of six selected (readymade garments and hosiery, sports good, leather good, yarn and textile, hand tools/machines and cycle and cycle parts) industries from Punjab since 1990 had been analyzed. Punjab has achieved remarkable growth since independence and is now one of the richest States of India. The success of industrialization in the context of dependence of industrialization not only on the capability of agriculture to generate surpluses but also on whether and how these surpluses could be channeled into industrial development. Punjab is mainly an agrarian state with 85.6 per cent of its total area under cultivation. It also accounts for 1 per cent of the world's rice production and 2 per cent of the world's wheat and cotton production. Being biased towards agriculture, much industry situated in the state is food and beverage based.

The various studies had conducted on India/Punjab industrial export performance at national as well as State levels. These industries were playing very important role in terms of exports, employment, output, profitability and scope of development. Before the liberalization period the industrial exports was not able to achieve economies of scale, employment level etc. Various studies stated that after the liberalization period, there were huge increments in exports of Punjab as well as India at large scale due to up gradation of technology, increasing economies of scale. Another important factor that played important role was education which further leads to skilled labour and investment by MNC's. To sum up, growth of industrial exports leads to economic development of nations as well as states.

No country, state or region can make progress on the basis of primary productive occupations alone, especially when such a region has a large and rapidly increasing population. To achieve increasing income, higher standard of living, higher purchasing power, greater opportunities for jobs and over all development, better and efficient use

of natural and agricultural resources is essential. Punjab is basically an agricultural state but after liberalization it shift from agriculture to industries and noticed a huge increments in industrial exports. The main industrial districts in Punjab are Ludhiana, Jalandhar and Amritsar and account for 90 per cent of exports from Punjab. Ludhiana is known for yarn and textile/Readymade garments/hosiery/Bicycle and bicycle parts industry, Jalandhar is known for Leather, sports and hand tool industry and Amritsar is also known for its Yarn and Textile /Ready Made Garments/ Hosiery industry. Punjab has highly developed small scale industries and has surplus of various small scale and other industrial and manufactured products such as bicycles, sewing machines, hosiery goods, leather goods, tools etc. Besides these medium and major industrial units, a large number of small scale and tiny units are also engaged in the manufacture of the same products. Export of Punjab was Rs. 10819 crore out of the total exports of Punjab Rs.19366 crores in 2012-2013. A large part of (about 94.5 per cent) of industrial exports of Punjab originated from its three major industrial districts; namely Ludhiana (51 per cent), Amritsar (18 per cent) and Jalandhar (21.7 per cent) in 1999-2000 and in the year 2001-2002 total exports from Jalandhar was Rs. 94764 Lakh, Amritsar Rs. 69512 Lakh and from Ludhiana Rs. 230364 Lakh. Punjab's total export in 2001-2002 was worth Rs. 440790 Lakh. From 2001-02 to 2011-12 the export as percent of GDP was 4.82. The per cent of ratio export to import was 70.37 per cent. There are no more variations in the share from the year 1989-90 to 2011-12. Only in the year 1997-98 this share increased to 3.32 but again this share reduced to 2.12 per cent in the year 2001-02. After 2003-04, it reduced 14 per cent to 7 per cent in 2011-12. Major exports from Punjab in international market are USSR, Arabian Countries, Hong Kong, UK, Italy, USA, France, Malaysia & Singapore, Australia etc. Export Promotion Councils provide useful information and assistance to increase exports from Punjab.

Punjab is a land of boundless opportunity for agriculture as well as industry development. The state has number of small, medium and large-scale industrial units. Major Industries in the state include metals, manufacturing textiles, hosiery, yarn, sports goods, hand tools, bicycles, and light engineering goods. The areas of industrial thrust include agro-industry, electronics, dairy industry, pharmaceutical Industry and white goods industry. There are nearly 194,000 small scale industrial units in the state in

addition to 586 large and medium units. Ludhiana is an important centre for industry. The average of total exports of selected industries from 1990-91 to 2001-02 was Rs. 2992 crore. It increased to Rs. 13693 crore during the period 2002-03 to 2013-14. Technology up gradation and improvement in infrastructure was the main cause to increase in the average of total exports from Punjab. Percentage share of exports increases because industry get R&D benefits and adopt new technology, which save input costs drastically and importing state-of-the-art machinery and the latest technology from Taiwan, especially Cold Forging Technology and Blue Moulding Technology. GDP and Exports had highly positive correlation i.e. 0.953**.** The correlation coefficient between the GDP and EXP was very high and statistically significant at 1 per cent level throughout the study periods. The Augmented Dickey Fuller Unit Root Test was significant on Export with second difference**.** In this case Durbin Watson statistics was 2.26 which means test was reliable (no auto correlation among residuals). ADF was -3.58 which was less than the critical values at 1% level of significance. The series was stationary at second difference. The Augmented Dickey Fuller Unit Root Test on GDP was significant with second difference**.** In this case Durbin Watson statistics was 1.7 which means test was reliable (no auto correlation among residuals). ADF is -4.36 which was less than the critical values at 1%, 5% and 10% level of significance. The series was stationary at second difference. GDP and Export of selected industries has long run relationship**. T**he null hypothesis is accepted i.e GDP does not Granger Cause EXPORT because in this case probability value was more than 0.05. In second case, the null hypothesis is rejected and concludes that EXPORTS Granger Cause GDP. From analysis, the chief findings were that the major sectors which have made significant contribution towards exports from the state were woollen textiles, bicycles and parts, hosiery goods, hand tools, leather products, and sports goods. Technology up gradation and improvement in infrastructure was the main cause of increase in the total exports from Punjab.

Punjab is on its way to rapid industrialization through coordinated development of small, medium and large scale industries. Industrial sector of Punjab plays a significant role in the development of state. Ludhiana leads in industrialization, accounting for more than 35 per cent of the industrial output, 23 per cent of industrial units and 33 per

cent of industrial workforce of Punjab Ludhiana is leading player in readymade and hosiery industry. Ludhiana accounts for about 21 per cent of all industrial units and over 28 per cent of the industrial output of the State. The hosiery and garments sector is much more labour intensive, small scale, employing 5-40 workers per unit. The Ludhiana cluster produces about 60 per cent of the total cycles manufactured in the country in the large and small scale sector and more than 80 per cent of the parts and components in the small and tiny sector. Hero Cycle Ltd. commenced production of complete cycles in 1956 as an SSI unit in Ludhiana and became the world's largest producer of bicycles in 1989, with a record production of 29,36,076 units and entered the Guinness Book of World Records. Jalandhar was main cluster for the sports good industry in Punjab. Jalandhar contributes 55-60 per cent of the total sports good exports from India. The sports goods industry in Punjab provides direct employment to about 10,000 workers and indirect employment to 40,000 workers. Ludhiana district was worldwide famous for yarn and textile industry. In recent years this industry progressed gradually. Till recent years main trading partner for the export of textile and yarn was the USSR. However, after its disintegration, exports have diversified to other markets, viz., Europe, USA and other advanced countries. Production in the textile and yarn industry achieved an impressive average annual growth rate. Abundance of raw material, trained labour, enabling infrastructure, cluster development and an established industrial ecosystem ensure an ideal environment for the booming textile and yarn industry in Punjab. Jalandhar was the main cluster of leather industry in Punjab. Items produced by this sector include, bags, handbags, hand gloves and industrial gloves, wallets, ruck sacks, folios, brief cases, travelware, belts, sports goods, upholstery and saddlery goods. The main importers of leather goods are USA, European Union, Africa, Hong Kong, Australia. The hand tools industry was concentrated in Jalandhar and Ludhiana. The use of hand tools covers almost all types of industries, viz., engineering, electrical and electronics, construction, plumbing, etc. Absence of these tools would in fact paralyse every type of industrial activity. Unavailability of major raw material such as iron or coal, was a definite hindrance for the establishment of large and medium scale units in Punjab. Punjab Government stepped in to help make large & medium scale production profitable in Punjab. Punjab has not been able to achieve faster growth of

industries in the state because of Unavailability of major raw material. Projections have been made for the industrial exports of Punjab at current prices on the basis of their actual performance during 1991-92 to 2009-10. Punjab can export goods worth Rs. 43814 crore in 2020-21. Thus, based on Punjab's actual exports, there exists a scope for her exports in future. Therefore, efforts at the international level are required to be made to increase the exports to earn a fair name for Punjab in the world trade.

6.2 CONCLUSION

The sports good industry in Punjab is in very extreme condition because of tax burden, lack of raw material, and Chinese good onslaught. But the sport industry is very important for Punjab because it produce about 2 lakh footballs per day among other providing direct employment to nearly 60,000 and indirect employment to about 1.5 lakh people in Punjab. Punjab has nearly 1000 sports good manufacturing units, and 25 per cent had migrated to Meerut (Uttar Pradesh) and Jammu (J&K). For attracting investors from Punjab, Uttar Pradesh and J&K government exempted the sports industry from the difficulty of obtaining C forms and also given other benefits and reduces the taxes. Due to lack of labs, R&D centers and other facilities sports industry manufacturing only 40 sports items out of 140 sports items. According to data of sport good industry in Punjab, almost 30-35 per cent of manufacturing units surviving by trading imported sport goods such as badminton and tennis racquets, shuttles corks, boxing equipments, football, basketball, athletics and gymnastic equipment.

Jalandhar and Ludhiana is the cluster of hand tool industry in Punjab. The majority of units are in medium and small scale enterprise (MSME). With the setting up of Common Facility Centres (CFCs) called 'The Institute for Auto & Hand Tool Technology' in the two cities, account for 75-85 per cent of India's total hand tools exports, will enable MSMEs to get their work outsourced, assist them in adopting new technology and in carrying out research and development. The hand tool industry of Punjab employs nearly 60,000 people and consists of about 250 units, the majority of them in the SME sector in Jalandhar, while Ludhiana accounts for 100-150 units. The major export markets are the United States and the European Union, and the exporters supply hand tools to major retail chains like Wal-Mart, B & Q and Home Depot. The

CFC at Jalandhar is being sanctioned by the department of industrial policy and promotion (DIPP), ministry of commerce, while the CFC at Ludhiana has been sanctioned under Assistance to States for Development of Export Infrastructure & Allied Activities (ASIDE), also under the ministry of commerce. The Punjab government has agreed to lease eight acres of land in Jalandhar for the research centre. Industrialists can outsource their work, get R&D benefits and adopt new technology, which will save input costs drastically and importing state-of-the-art machinery and the latest technology from Taiwan, especially Cold Forging Technology and Blue Moulding Technology. The problem generally faced by the exporters of hand tool items is sometime absence of buyers. The forecasting of export of hand tool equipment exports of hand tool industry will grow.

The textile industry in Punjab is passing through the most tough and difficult times in recent times. The Textile industry in Punjab suffering from US economic recession, due to this the cotton price increased by 40 per cent, high interest rates is facing closure and lead to mass unemployment. The direct and indirect employment of textile activity in the state of Punjab is estimated at 2 Million people. The textile industry particularly spinning units located in Punjab are suffering more because of the higher taxes & levies, higher cotton cost & power shortage. With induction of entry tax on cotton, the Punjab Textiles Industry become more in competitive. Because of the Punjab is far from sea ports the logistic costs add pain in burdened Industry.

Ludhiana cycle industry faces the big problem with the cheap import of Chinese products. The cycle market at Gill Road, Ludhiana, has been known as "Mini china market". Not only the cycle industry but also the bicycle parts industry of Ludhiana has been hit hard due to import of cycle parts from China. As a result, nearly 250 units have shut down their operations in the recent years. Every month Ludhiana dry port receives at least 100 containers of Chinese cycle parts. It badly affects the exports of cycle and cycle parts from Punjab. The overall export of the cycle and cycle parts has also fallen. while on the other hand imports have increased in the recent years. According to the manufacturer of cycle and cycle parts, customers prefer buying the cheap Chinese products and all cycle parts are now imported from China. Some of the manufacturers

have turned to importing cycle parts from China rather than manufacturing these locally. More than 10 big industrial houses, including Hero Group, Eastman, Safari Cycles and Sadem Cycles, have even opened up their offices in China to source cheap bicycle components for export to markets in developing countries. Another problem faced by cycle industry is continues rise in price of steel. Acc to the data released by economic times if steel prices continue to rise, then the cycle industry expecting a 50 per cent slowdown in domestic production and export.

With global economic slowdown, leather industry Punjab suffers a problem. Punjab leather industry facing major downturn. There was sharp decline in the export and domestic consumption witnessed by Jalandhar city. Jalandhar is a major production centre for finished leather, leather goods, footwear and leather garments, contributing a share of more than 80 per cent of the exports from Punjab. The leather was one of the largest export oriented commodity in India and 70 to 80 per cent of production of leather was meant for direct or indirect exports. Jalandhar Leather Complex, comprising 100 of leather units, deserve the status of SEZ instead of spending huge allocations of fund for any new SEZ. According to Union Minister of State for Industry, Ashwani Kumar, total turnover the leather industry was Rs 33,500 crore, out of which Punjab contributes Rs 1000 crore only in total turnover and Rs 400 core only in Export, which was very low. And Leather Industry in Punjab is not working up to its potential and it is must for the industry of the state to attain the global recognition to have global acceptability and credibility by improving their technological skills. Power cuts are also a problem for leather industry in Punjab. Animals are badly infested with ticks, owing to which the leather fails to pass quality tests for export purposes. Another problem faced by leather industry is prices of finished goods are not moving up in synch with the raw material prices. Cost of raw leather sheet has increased by Rs5 per square feet and prices of chemicals have gone up by about 10 per cent and further 10 per cent rise is expected in near future.

Globalization affects the exports growth. The entire liberalization process faces numerous constraints. Foreign investors are still tentative in committing funds for capital-intensive projects. The Indian/Punjab brands are still not very popular abroad

and are thus hampering exports. The process of globalization affects the exports from Indian Punjab. Punjab economy has also witnessed the impact of various economic policies. In last we can conclude that the Punjab economy has potential for growth of industrial sector. The major threat is from Chinese market as far as industries are concerned.

6.3 RECOMMENDATIONS

1. Industrial productivity of Punjab can be improved by increasing public investment in power, roads etc. the use of cost reducing technology and internal liberalization of industrial trade can also help in raising productivity.
2. Punjab Government should invite NRI's for investment in Punjab in various industrial sectors, which may cause increase in industrial production.
3. Punjab should strengthen its marketing network. A basic problem of industry is absence of reliable marketing mechanism. The fact is that the consumer pays. As such middleman eat away a big part.
4. Punjab should explore export markets for its surplus industrial production, which is causing financial loss. Export subsidy should be provided. Under WTO, developing countries like India can give subsidies on export marketing costs, internal and international transport and freight charges.
5. Punjab government should promote the use of Information Technology (IT) in industrial sector by giving special training to the industrialists. Through INTERNET access, industrialists, exporters can learn the latest industrial techniques in the world. They can get information about various industrial commodities, their prices and new markets. They can cheaply interact for the marketing of their produce after understanding the global demand and supply of industrial products. They can use E-Com (Electronic Commerce) to enhance their business.
6. Punjab government should provide incentives to the exporters such as removal of octroi duty, reduction in sales tax, cheap electricity etc. Punjab Government should give industrial concessions to face the international competitiveness.

7. Punjab government should use proper planning for industry; Punjab government should set up subsidized factories whose job is simply to supply cheap goods for exports.
8. Punjab has tremendous potential to develop sports industry, hosiery industry, leather industry, hand tool industry which may provides higher benefits for industrialist. Punjab should take advantage from new EXIM policy of the central government, in order to promote industrial production and exports.
9. Punjab State Industrial Development Corporation (PSIDC) a prime institution of the state government should provide certain incentives for the promotion of large and medium industries. It is essential for commencement of these projects for industrial development, which provides employment in the economy, which help in increasing standards of living of the people.
10. Punjab government should provide up-to-date information about new markets to the exporters, with help of these exporters can explore themselves in the international markets.
11. Punjab government should conduct various training programmes for exporters about the quality, maintenance, prices, various export policies etc.
12. For the development of industrial infrastructure in the state it is the duty of the Punjab Small Industries and Export Corporation to develop various industrial focal points including growth centres and mini growth centres at various places in the state.
13. There is need for a radical strategy to promote exports which India/Punjab has a comparative advantage. It is the duty of the Centre Government, with the removal of QRs on Indian imports; apprehensions have been expressed that such removal may impact the domestic producers adversely and result in a surge and dumping of imports into the country. However necessary mechanisms have been put in place to provide adequate protection and a level playing field to domestic players vis-à-vis imports.
14. To solve the problem of sports good industry in Punjab government should have follow the EU policy of anti dumping. EU imposed the 25 per cent anti dumping on finished Chinese sport goods.

15. Punjab government can setup research and development centres in the state to cater the international standards that required during the production process. This will helps to face international competition.
16. The government may introduce sports subject as a part of the curriculum at school and college level.

6.4 LIMITATIONS AND FUTURE SCOPE

A limitation of the current study was the availability of data and qualitative aspect required for study through interview of exporters. Due to certain constraints like availability exporters and their feedback, the study was under-powered and data used in the study was in Indian currency. Future study may be conducted, based on the primary data, to know the actual problems faced by the exporters with comparative analysis of performance of major export houses operated in Punjab.

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