




AN EMPIRICAL STUDY OF THE ECONOMIC STATUS OF PUNJAB CONCERNING INDIA



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ABSTRACT

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Industrial growth is one of the essential drivers for the economic growth of any economy. In this paper, an attempt made to measure the growth rate of the Punjab industry in India during the period of post-liberalization era-spanning 2003 -2004 to 2017-2018. The study measures the magnitude and nature of the relationship among different components such as numbers of factories, fixed capital, investment, and profits, Net Value Added. Growth parameters of the manufacturing sector have used for the study. Econometric models, namely, Unit root test and Granger Causality applied in the existing research for analysis. The study shows that there is a strong positive relationship between the growth of the industry in Punjab and growth in India. Economic Reforms and liberalization process fail to bring significant improvements in the performance of the industry in terms of the factors, namely, number of units, employment, production, and fixed investment in Punjab. Finally, the paper also provided recommendations to boost the development of industries in Punjab.

Contribution/ Originality: This study contributes in the existing literature and measures the degree and nature of relationship among different parameters related to the growth of the industry in Punjab and growth in India. The study indicates strong positive relationship exists among the growth of the industry in Punjab and growth in India.

1. INTRODUCTION

Manufacturing can be a critical indicator of transforming the economic structure of developing countries. Manufacturing acts as a driving force of economic growth as well as on the development of countries (Andreoni and Upadhyaya, 2014). Every nation has to go through its learning procedure. The learning process blends with industrial policy investigation with oppressive influence analysis to develop evidence-based industrial policy measures of the nation. Unido's Industrial Development report, 2013 correctly frame that the manufacturing sector in a world today is an essential driver for the continuous economic and social development of the developing countries. Figure 1 exhibits mid-year estimates produced by UNIDO; the figures have shown that the annual growth of world MVA (Manufacturing Value Added) is likely to be around 3.5 percent in 2017.

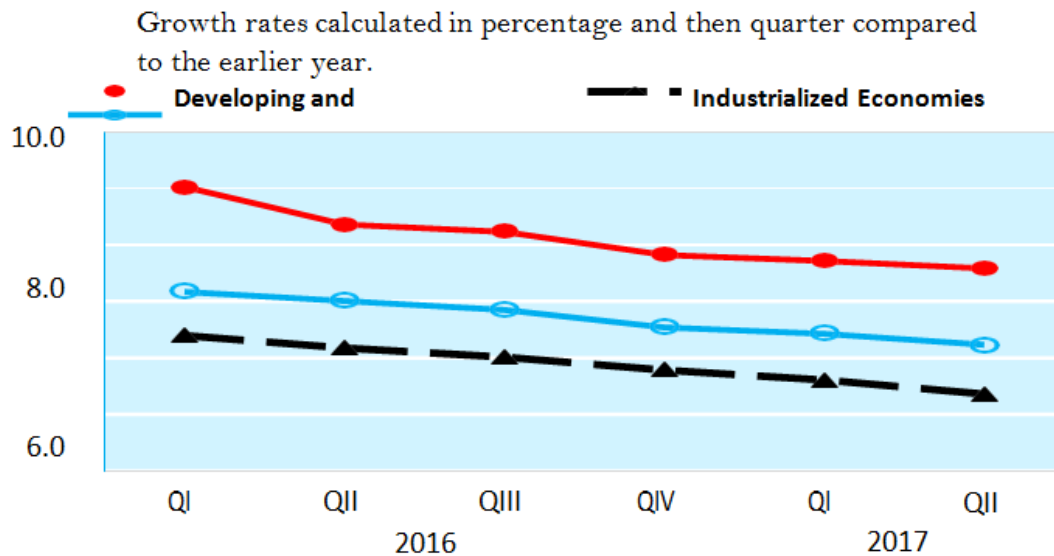


Figure-1. World manufacturing output.

Source: UNIDO, 2017.

The estimates have shown that growth in developing countries has slowed down over the previous few years. Developing nations, namely, India, continuously face challenges as the U.S. dollar appreciation sharply increased several countries financing expenditure. As a result, external economic conditions are becoming strained.

In India, an industrial manufacturing sector has come a long way since the 1990s- an era, which marked a change in the way the industrial manufacturing industry, directed. The trajectory of manufacturing growth in India has been a subject of scrutiny and intense debates (Ajit, 2008). Significant attempts have made to locate close and eventual sources of its growth. The era witnessed substantial modifications in industrial and trade policies that opened more channels for private consumption in the economy. The transformation witnessed a withdrawal from the state-directed planned industrialization. The changed policies involved a collective effort to assimilate India with the rest of the world. Therefore, collaborative efforts result in the liberalization of trade.

A look at the currents of Indian history, Punjab's role seen as momentous as Punjab has an eccentric history of industrial development (Garg and Jain, 2008). Post green revolution has been quintessential with sobriquets like prosperity and progression, particularly compared to the rest of India. Till pre liberalization era, the industrial development in Punjab located to only urban areas connected with G.T. road, namely, Jalandhar, Phagwara, Ludhiana, Khanna, and Mandi Gobindgarh (Nirvikar, 2015). Statically, the total number of registered units in Punjab was 74%. 69% of the industrial workers employed in the state. Therefore, the Punjab state witnessed sheer-sided development till pre liberalization era.

1.1. Manufacturing Performance of Punjab: an Overview

The graph Figure 2 of the Gross domestic product of Punjab in comparison to India has shown an insignificant contribution.

It can observe from the graph that Gross Domestic Product of Punjab has accelerated every year, showing an upward trend, but the scenario in case of India is abysmally stagnant as there is minimal change and that too on the negative side from last 8 years. The graph Figure 3 depicts that sectoral growth rate of Punjab concerning India (2017-18). Has not shown any significant benefaction, preferably from the below chart, it can gauge that the manufacturing sector in Punjab contributes to nearly 14%. There is an increase in the manufacturing growth rate of India due to the new economic policy regime, but that rise didn't bring any transformation in the industrial growth of Punjab.

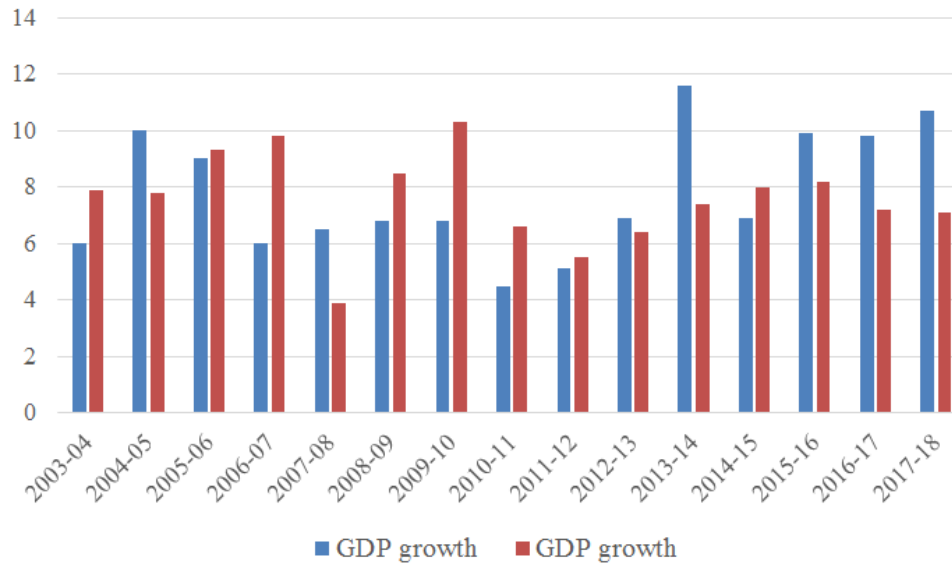


Figure-2. GDP growth of Punjab in relation to India.

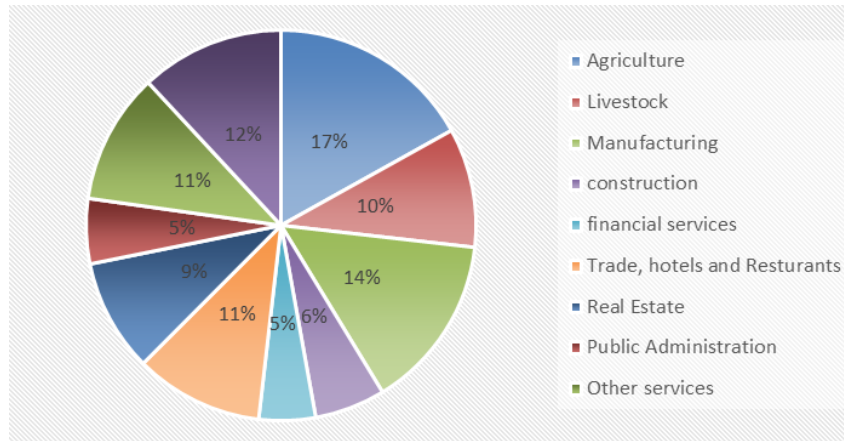


Figure-3. Sector wise growth of Punjab (2017-18).

In Figure 4, Punjab's statistics remain absurdly inadequate, compared to states like Maharashtra and Gujarat and Goa.

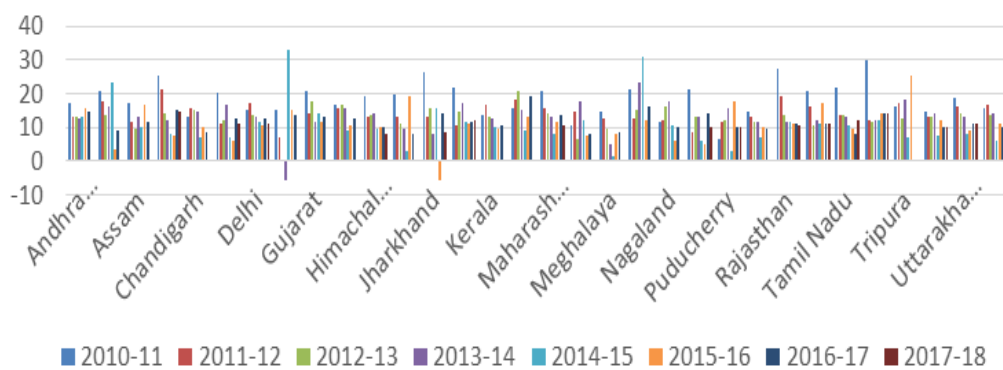


Figure-4. State wise GDP of India.

2. REVIEW OF LITERATURE

Manufacturing activity in India witnessed territory-specific development (Mitra *et al.*, 2002). Therefore, regional or state-wise analysis of the manufacturing industry in India becomes very important (Das *et al.*, 2017). In 1991, the new economic policies made limited changes on the grounds of regional and state industrial growth in India (Mukherji, 2009). One of the researches had a contradictory observation (Ray, 2002). The research evaluated the influence of economic reforms on efficiency and total productivity concerning the manufacturing sector in

Indian states from the period 1986-87 to 1995-96 (Mitra *et al.*, 2002). The research analyzed an improved Total Factor Productivity Growth (TFPG) in most of the Indian states during the economic reform era 1992-92 to 1995-96 (Tripathi, 2010). Many studies have done on growth patterns and performance of the industrial manufacturing sector, which would provide a broad spectrum to design appropriate strategies to accelerate the pace of industrial growth, especially in the manufacturing sector (Srividya *et al.*, 2014). Most of these studies focus on productivity performance.

The study Investigates positive impacts by the Kendrick index, Solow index, and Translog index of total factor productivity after post-liberalization (Hulten and Srinivasan, 1999). Various parameters, namely Investment, labor productivity, and capital per worker from economic reforms, have been considered to study the positive impact on industrial manufacturing growth after 1991. The study concluded that technological progress has contributed to output growth though marginally and grow fragile factor productivity. But a study conducted by Majumdar and Mukherjee (2014) has a contradictory assessment that revealed a decline in the nineties, which was picked up low and did not contribute much to the factor productivity growth later on in the last decade. It observed that technical progress in the era of post-liberalization is inert.

The present industrial base of Punjab is palpable by short-sightedness, having the productive brisk approach and massive subsidy persuaded. The dearth of metallic mineral resources, long and susceptible international border, AWOL of well-developed ports and lack of participation of banking sector in financial, industrial endeavors due to innate risks, lack of foreign direct investment are some determinants which reflected growth of medium to large operated industries in the Punjab (Kristian and Armin, 2004). Identical elements realized to evaluate the industrial growth rate of the Punjab economy from the period 1980-81 to 2001-2002 by the value of output. The research conducted on total factor productivity through the Translog index. The present study clearly shows a downward trend in industrial growth during the post-liberalization era compared to the pre-economic reform era (Singh and Singh, 2009). In support of this observation, an in-depth comparative study has been conducted of states of Gujarat, Punjab, and Himachal Pradesh to know the growth pattern of state industries. By applying various statistical models of correlation and regression, it concluded that among the three states, Punjab growth is in the downward movement. To reevaluate the policies by the state government is needed to rejuvenate the manufacturing growth (Trehan and Mir, 2015).

The literature review of earlier studies shows that there are specific gapsthat need to realize. Minimal research consummated to study industrial growth patterns and performance of Punjab concerning India during the liberalization era of 2003-2004 to 2017-2018. Moreover, previous studies have concentrated on the growth pattern of industries by applying the total factor productivity method only. The present study has brought light on the industrial development of the manufacturing sector from 2003-2004 to 2017-2018 by estimating the magnitude and nature of the relationship among different industrial manufacturing characteristics using econometric tools.

3. THE RATIONALE OF THE STUDY

The growth of the Punjab economy has come down immensely. From 2003 to 2017, the Punjab economy grew at a rate of 5.6% per annum, which is lesser than India's overall growth rate of 6.9% per annum. Despite this, Punjab has a strong potential to get back to its previous stand. For achieving this goal, there is a need to take collaborative efforts towards this direction. Existing research attempted to focus on the causes of the past and present the deteriorating condition of Punjab Industries. Moreover, the paper also suggests ways to overcome this problem.

4. OBJECTIVES OF THE STUDY

- To compare the growth rate of Punjab manufacturing industries.
- To find out the reason for variation in the growth rate of the state about manufacturing industries.

5. RESEARCH METHODOLOGY

The present study evaluates the industrial manufacturing growth rate pattern of Punjab state in alliance with India. The study seizes the number of factories, fixed capital, capital formation, emoluments, investment, employment, net value-added, and profits constituents for analyses and evaluates the reason behind the variations in the growth rate due to these parameters. The study also appraises the magnitude and interrelationship among various variables. For this purpose, an analytical and descriptive approach applied, and data so collected is secondary. The time-series data from 2003-2004 to 2017-2018 from an Annual survey of industries and other authentic governmental portals have taken for collection of data. Various econometric tools Unit root, Granger causality, and descriptive statistics econometric models have practiced in the study for validation.

Econometric tools applied for examining decadal time series data spanning from 2003-2004 to 2017-2018. The investigation of econometrics can conduct a series of stationary essence. The research indicated the graphical presentation for each series. Further to confirm the random nature of the series, Correlogram computed for each of the series. Moreover, the study applied the Augmented Dickey-Fuller test under the unit root test to confirm the permanent status.

The paper takes the log of the series and reaches the stationary — the analyses conducted at the log of the series for the fifteen years interval data.

The paper takes the log of the series and reaches the stationary. All the remaining analyses performed at the log of the series of the fifteen years interval data. These variables named LEMPI, LEMPP, LFCI, LFCP, LGCFI, LGCFP, LINVI, LINVP, LNFI, LNFP, LNVAI, LNVAP, LPRFI, LPRFP, LTEI, and LTEP. From the stationary log series of the 16 parameters, the research performs the Granger's causality model to observe whether each growth parameter granger causes the other growth variable.

6. RESULTS AND DISCUSSION

The combined graph of the dlog mentioned in Figure 5 depicts high volatility in the variables of total emoluments, gross capital formation, and net value added and profits of Punjab, which shows gradually decadal slowdown.

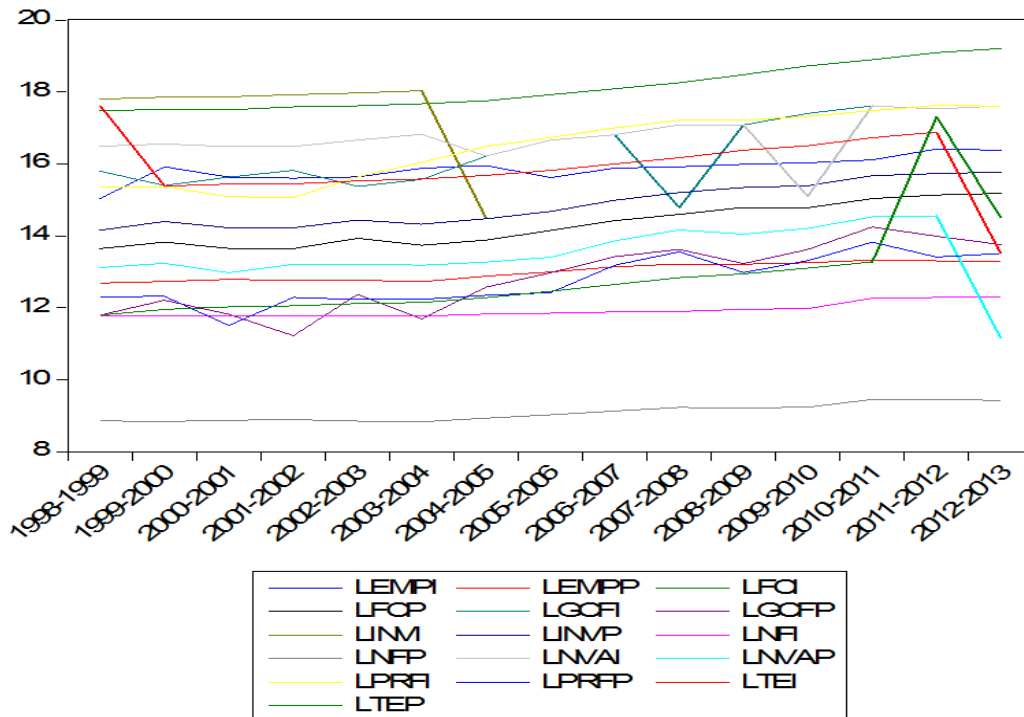


Figure-5. dlog for all variables.

6.1. Combine Graph of Dlog for All the Variables

The values of the estimates are non-stationary. To get the values of estimates for industrial manufacturing dlog is applied so that time-series data can be stationary, that is, original series are not constant in times, even after de-trending, perhaps the statistics of the changes in the series between periods are constant. Descriptive statistics are applied, which provides the historical background for the behavior of the data (whether values of variables normally distributed) used in the study.

It observed in [Table 1](#) in descriptive statistics that statistical values of the variable that is the gross capital formation of Punjab, net value added of Punjab, total emoluments of India, and Punjab and profits of Punjab were showing high volatility during the study period. The mean which provides the average of all data variables shows the highest averages are from fixed capital(18.11), net value added (16.74), and profits (16.48) from India and in case of Punjab highest investment (14.86) and fixed capital variable (14.29). The standard deviation, which lies between 0.20 to 1.2, shows that data typically distributed 99% of the values are within 1 standard deviation from the mean. Jarque-Bera test shows that all the variables of study exceed the reasonable significance level of critical value. Notably, in case of Net value added (5.6) and Total emoluments (26.67) of Punjab, which leads to the conclusion that the trend series data do not follow a normal distribution.

To get more definite answers on the part of the stationarity unit root test is applied. [Table 2](#) has shown that in the unit root test, all probabilities are less than prescribed critical value, which shows that data is stationary.

After the unit root test, the test of Correlogram is applied to variables understudy to check the randomness in data values at varying time lags. It observed in this test after 5th lag that in the year 2008-2009, data falls gradually from 1 to 0, and after the impact of that variable on each other, abrogate then becomes negative. The reasons for this quash because of ineffective implementation of manufacturing policies, non-existence of foreign direct investment, uneven industrial development. To overcome this muddle, state and national officials should vigorously intervene and address this matter.

Granger causality test was applied to assess whether one-time series data is useful in forecasting another. It observed that null hypothesis estimates have shown that the fixed capital of India doesn't cause the employment of India. Still, here, the p-value is less than the prescribed critical limit means the null hypothesis rejected. That is, the fixed capital of India can help predict the estimates of employment of India. Likewise, all mentioned null hypothesis having a p-value less than the prescribed critical value. Therefore, all null hypotheses having less than the p-value rejected. [Table 3](#) shows the results of the Granger causality test, which interpret those variables, which have a direct impact on corresponding characteristics.

By the application of the VAR Model, it has observed that the integration of Variables with the other can established if the table value is more than 1.96. It can be observed from [Table 4](#), that LFCI does not influence any variable on the lag of one but influencing the LTEP on the lag of 2. Apart from this, there is no regression shown by the VAR in the given case.

Table-1. Descriptive statistics.

	LEMPI	LEMPPI	LFCI	LFCP	LGCFI	LGCFP	LINVI	LINVP	LNFI	LNFP	LNVAI	LNVP	LPRFI	LPRFP	LTEI	LTEP
Mean	15.86569	13.00367	18.11683	14.29271	16.35133	12.83648	16.31249	14.86661	11.92635	9.082574	16.74636	13.47397	16.48242	12.76115	15.90954	12.89648
Median	15.91633	12.99281	17.92136	14.14667	16.21407	12.97339	15.73015	14.67974	11.85054	9.027859	16.66239	13.27206	16.73037	12.41945	15.81710	12.45843
Maximum	16.41300	13.32763	19.20012	15.17826	17.61489	14.24798	18.03443	15.77022	12.31097	9.454854	17.61489	14.55242	17.62579	13.82212	17.61383	17.31001
Minimum	15.04022	12.68316	17.48202	13.64339	14.78247	11.22186	14.47053	14.15527	11.75945	8.832442	15.10156	11.15856	15.06495	11.50958	13.51004	11.79706
Std. Dev.	0.337555	0.248642	0.615099	0.581388	0.948070	0.949240	1.392619	0.602293	0.198866	0.236776	0.631564	0.837330	0.963430	0.670458	0.924077	1.404567
Skewness	-0.581741	0.020951	0.569395	0.286378	0.039083	-0.164467	0.215505	0.298895	1.133605	0.411547	-0.825799	-1.170168	-0.296065	-0.005476	-0.705830	2.281439
Kurtosis	3.779447	1.269044	1.834954	1.510855	1.625091	1.724011	1.311712	1.503619	2.720939	1.654730	4.297698	4.990831	1.497848	1.915563	4.545496	7.674721
Jarque-Bera	1.225769	1.873727	1.658858	1.591002	1.185303	1.085216	1.897554	1.622817	3.261323	1.554523	2.757374	5.900361	1.629424	0.735077	2.738339	26.67054
Probability	0.541786	0.391855	0.436298	0.451355	0.552859	0.581230	0.387214	0.444232	0.195800	0.459663	0.251909	0.052330	0.442767	0.692437	0.254318	0.000002
Sum	237.9854	195.0550	271.7524	214.3906	245.2700	192.5473	244.6874	222.9992	178.8953	136.2386	251.1954	202.1096	247.2363	191.4173	238.6431	193.4472
Sum Sq. Dev.	1.595209	0.865521	5.296854	4.732165	12.58371	12.61478	27.15144	5.078591	0.553670	0.784879	5.584230	9.815694	12.99477	6.293189	11.95485	27.61932

Table-2. Group unit root test.

Method	Statistic	Prob.**	Cross-sections	Obs
Null: unit root (assumes common unit root process)				
Levin, Lin & Chu t^*	-10.4082	0.0000	16	204
Null: unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.47472	0.0000	16	204
ADF - Fisher Chi-square	130.021	0.0000	16	204
PP - Fisher Chi-square	177.371	0.0000	16	208

Table-3. Granger causality test.

Growth parameters	Granger cause variables
Employment of India	Gross Capital Formation of India
Employment of Punjab	Fixed Capital of Punjab, Profits of Punjab
Fixed Capital of India	Employment of India, Fixed Capital of Punjab, Gross Capital India, Gross Capital Formation of Punjab, Investment of Punjab, Number of Factories India and Profits of Punjab
Fixed Capital of Punjab	Number of Factories of Punjab and Profits of Punjab
Gross Capital Formation of India	Gross Capital of Punjab
Gross Capital Formation of Punjab	Profits of Punjab
Investment of India	Investment of Punjab
Investment of Punjab	Profits of Punjab
Number of Factories of India	Net Value Added of India and Net Value Added of Punjab
Number of Factories of Punjab	Net Value Added of India
Net Value Added of India	Number of Factories of India and Number of Factories Punjab
Net Value Added of Punjab	Net Value Added of India
Profits of India	Gross Capital Formation of Punjab and Investment of Punjab
Profits of Punjab	Profits of India
Total Emoluments of India	Employment of India, Fixed Capital of India, Profits of India and Profits of Punjab
Total Emoluments of Punjab	Employment of India, Number of Factories of Punjab, Net Value Added of India and Profits of India

7. CONCLUSION

Given the available data from 2003 onwards, analysis has shown that notably three significant findings. First, the manufacturing growth rate of Punjab industries fails to contribute considerably towards the industrial growth rate of India (Singh and Singh, 2002). Second, changes in the decadal trend of industrial growth of Punjab economy are both cause and consequence of bringing variability in the industrial growth of India (Kalirajan *et al.*, 2009). Last, there is a deceleration in the manufacturing sector of the Punjab industry. Deceleration present even after new industry policy initiatives since liberalization (Burange and Yamini, 2011). Furthermore, the study has shown that these conclusions are robust to alternative estimation methods, potential eccentricity, and sample selection, different measures of industrial growth, the sample period, and the admittances of education (Aghion *et al.*, 2012).

The industrial architecture of Punjab has remarkably widened in diameter, diversified in formation, and dispersed over space. Mostly, large/medium scale units in Punjab developed in big cities, namely, Jalandhar, Phagwara, Ludhiana, Khanna, and Mandi Gobindgarh nearby easy availability of rail and road transports (Kaur, 2016). Small-scale industries developed in villages or nearby village areas of cities (Guin, 2018).

Punjab cannot describe as industrially backward in its current scenario, but there is disrupt which requires to address (Singh, 2003). It becomes imperative to have a significant transformation from agriculture to non-agriculture sectors, improved employment opportunities, and lessen regional disparities (Kumar, 2006). Such transformation can ensure through backward and forward linkages of the manufacturing industries with the agricultural sector (Saikia, 2009). Moreover, a comprehensive study of the internal and external economic and financial environment of the industry of Punjab state recommended (Gayathri and Mangaiyarkarasi, 2018).

Table-4. Vector auto regression.

Growth variables	LFCI	LNVAI	LNVAP	LTEI	LTEP
LFCI(-1)	-2.053402 (4.38676) [-0.46809]	-10.54898 (53.8258) [-0.19598]	-10.06762 (29.9558) [-0.33608]	-3.566184 (8.75597) [-0.40729]	-38.68258 (36.9815) [-1.04600]
LFCI(-2)	-0.348936 (0.40749) [-0.85630]	2.144903 (4.99995) [0.42898]	-2.932233 (2.78263) [-1.05376]	-1.132164 (0.81335) [-1.39197]	12.58712 (3.43526) [3.66409]
LNVAI(-1)	-0.128475 (0.19851) [-0.64720]	-1.532050 (2.43571) [-0.62899]	-0.723017 (1.35555) [-0.53337]	-0.262900 (0.39622) [-0.66352]	-0.935260 (1.67348) [-0.55887]
LNVAI(-2)	-0.120634 (0.21424) [-0.56307]	-1.450457 (2.62875) [-0.55177]	-0.773709 (1.46298) [-0.52886]	-0.255751 (0.42763) [-0.59807]	-2.180990 (1.80611) [-1.20756]
LNVAP(-1)	-0.190548 (0.33024) [-0.57700]	3.282104 (4.05205) [0.80999]	-0.226669 (2.25510) [-0.10051]	0.085982 (0.65916) [0.13044]	-3.337994 (2.78400) [-1.19899]
LNVAP(-2)	-0.175509 (0.38276) [-0.45854]	-0.514397 (4.69648) [-0.10953]	-0.824764 (2.61374) [-0.31555]	-0.329937 (0.76399) [-0.43186]	-4.940835 (3.22676) [-1.53121]
LTEI(-1)	2.104343 (1.20403) [1.74775]	3.961062 (14.7735) [0.26812]	7.253257 (8.22194) [0.88218]	3.942459 (2.40324) [1.64047]	10.12891 (10.1503) [0.99790]
LTEI(-2)	0.171590 (0.34750) [0.49378]	-0.130321 (4.26388) [-0.03056]	0.727572 (2.37299) [0.30661]	0.251217 (0.69362) [0.36218]	2.776871 (2.92954) [0.94789]
LTEP(-1)	0.051100 (0.12202) [0.41878]	1.101043 (1.49722) [0.73539]	-0.420862 (0.83325) [-0.50508]	-0.737890 (0.24356) [-3.02964]	0.495708 (1.02868) [0.48189]
LTEP(-2)	1.966967 (3.99607) [0.49223]	1.561042 (49.0320) [0.03184]	8.969826 (27.2879) [0.32871]	3.007651 (7.97615) [0.37708]	30.48241 (33.6879) [0.90485]

The business in Punjab is active for agriculturally based raw material, infrastructure development, aggressive entrepreneurship, skilled and semi-skilled labor, and high consumption level of the people (Singh and Singh, 2002). Furthermore, Weaknesses in Punjab state lies with low industrial wage rates, absences of reservoirs of minerals, and the presence of small-scale units (Babu and Natarajan, 2013).

A large section of industrial labor working in Punjab expatriates from the low-income states, namely, Bihar and Uttar Pradesh (Gill *et al.*, 2017). Labor from other states ready to work on low earnings and thereby discourse an income verge, which does not aid with the local labor of Punjab state (Papola and Kannan, 2017). It is one of the apprehensions, which hinders the growth of local employment from probing a robust industrial base. Nevertheless, various government inducements and grants are rightly being drawn out, but new specifications of the World Trade Organization (WTO) provide menace to the industry (Gupta, 2015). Due to this reason, the Punjab industry is also now facing severe competition with industries outside the country as well (Mehta and Rajan, 2017).

To overcome hindrances, the pertinent framework needs to design to ensure the growth of effective industrialization in Punjab (Mohanty, 2014). The constant determination and development of those industries for which the state more considerably dependent. Moreover, new regulations related to the increasing use of technology in small to large scale industries required (Shaqiri, 2015). Manufacturing industries of Punjab limited to the production of liquor and mal products, leather goods, paper items, chemical manufacturing, milk, and dairy products, hosiery and readymade clothes, and sports goods (Singh and Singh, 2017). Therefore, the expansion of different sectors required and thereby ensures new employment opportunities.

The accelerate industrial development, escalation along with the trunk trials, call for peculiar concentration. Still, this unique way can consider as a dynamic feature for industrialization; it also possesses some problems that need to address, particularly those related to transport maneuverability, environmentally friendly sustainable development, and services related issues. The industry development, including the transport route development,

should be made in the design of a cluster rather than a ribbon (Bhat, 2014). Specific kinds of the industry should present through each cluster.

Altogether, unlike, other governmental machinery working at the state level, which entangled on to the new assimilation after 1991, and started adapting their regulatory machinery to captivate private investment in industry, Punjab somehow fizzles to take advantage of the new industrial policy regime. The ministry of Punjab has to struggle and reinforce their endeavors to accelerate the pace of manufacturing industrial development in Punjab (Pal *et al.*, 2003).

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