

LARGE SCALE INDUSTRY OF PUNJAB: EMPLOYMENT BASIS EMPIRICAL STUDY

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Abstract: *The present empirical study is confined to large scale industrial units of Punjab. The study covers district wise distribution of employment in the large scale industries of Punjab for the period ranging from 2003-04 to 2013-14 during the period under study. It is revealed that the least growth in the number of units has been witnessed in D2 where the number of persons employed in the industry have increased from 7299 persons employed in 2003-04 to 7374 persons employed in 2009-10 at CAGR of 0.67 percent, but this growth indicates the increase in the number of persons employed in this industry up to the year 2009-10 only because after that this industry was combined with the D1 industry from the year 2010-11. Alternatively, the number of persons employed in the units of D5 industry reduced from 2232 persons employed in 2003-04 to 180 persons employed in the units of this industry in the year 2013-14 at negative CAGR of -34.42 percent(t -value=-1.30). From the point of view of the trend equation, the employment among various units of industries is expected to increase in the year 2020-21 except in the units of D5, D7, D4, D13, D14, D9 and D6, as the units of these industries are also expected to decline by the year 2020-21. This is expected to be followed by D12, D3, D8, D15 and D10 where the numbers of persons employed are expected to increase to 8187 persons, 127007 persons, 14638 persons, 52584 persons and 1442 persons in the year 2020-21 respectively. It is further observed that keeping in view the existing trend equation, it can be predicted that employment in the units of Patiala, Fazilka, Tarn Taran, S.A.S. Nagar, Nawanshahar, Barnala, Hoshiarpur, Bathinda, Ludhiana and Fatehgarh Sahib is expected to increase by 2020-21 to 66914 persons, 4389 persons, 1096 persons, 50169 persons, 5781 persons, 15144 persons, 19373 persons, 7493 persons, 104352 persons, 4511 persons, respectively. On the other hand, employment in Sangrur, Amritsar, Gurdaspur, Jalandhar, Faridkot, Muktsar, Moga, Pathankot and Kapurthala is expected to decrease to 1927, 2169, 1104, 2739, 415, 1726, 1682, 399 and 16962 persons respectively in the year 2020-21.*

Key Words: Large Scale Industry, Growth Rate, Employment.

Section I-Introduction:

On November 1, 1966, Punjab was divided and Haryana became another State of India. The city of Chandigarh was retained as the joint Capital of Punjab and Haryana. Punjab has a Geographic area of 50,362 square kilometers and comprises of 22 Districts. Haryana has a total surface area of 44,212 square kilometers and also comprises of 22 Districts. The Government of Haryana state officially

notified Charkhi Dadri as 22nd district of Haryana on 16 November 2016. Agriculture forms the backbone for the economy and industry of both Haryana and Punjab. The share of agriculture to state income is also the highest and it is also a source of supply of raw materials to the leading industries of the state. Hence prosperity of agriculture stands for prosperity of Haryana and Punjab. Besides agriculture, industrialization has a major role to play in the economic development of Punjab and Haryana. Process of industrialization is also associated with the development of technological knowledge, attitude and skills of industrial workers, which in turn, is beneficial to the growth of productivity in agriculture, trade and other sectors of the industry. The main aim of economic development is to raise standard of living of the citizens of a country. It is a pattern of economic, social and behavioral changes that take place in an economy. It aims at developing new and better methods of production and acquisition of capital resources for providing better facilities to the society. It includes pattern of economic, social and behavioral changes that take place in an underdeveloped economy. With rapid economic development we can enjoy higher standard of living and get better social services. The sustained increase in per capita real output leads to socio-economic change over a wide front, which is crucial for raising standard of living of the people.

Section II-Objectives of the Study:

The study is confined to large scale industrial units of Punjab. The district wise distribution of employment in the large scale industries of Punjab for the period ranging from 2003-04 to 2013-14 is under consideration. The main objective of the present empirical study is to find out employment is generated by large scale industrial units in Punjab state.

Section III-Data Base, Sample Size and Research Methodology:

The study covers district wise distribution of employment in the large scale industries of Punjab for the period ranging from 2003-04 to 2013-14 during the period under study. For achieving the main objectives of the present empirical study mean, standard deviation, Coefficient of variation, CAGR (Compound Annual Growth Rate), t-test and Trend Coefficients are used to come to the final conclusions and findings. The abbreviations used for writing the results of this study in which D1 denotes Food Products, D2 denotes Beverages, D3 denotes Textile and Yarn including Dyeing, D4 denotes Hosiery & Garments, D5 denotes Leather & Leather Products, D6 denotes Paper & Printing, D7 denotes Coal, Coke & Petroleum Products, D8 denotes Chemical Products, D9 denotes Rubber & Plastic Products, D10 denotes Non-metallic Mineral Products, D11 denotes Basic Metal Products, D12 denotes Metal Products, D13 denotes Machinery & Parts except Elec., D14 denotes Electrical Machinery & Parts, D15 denotes Transport Equipment & Parts, D16 denotes Misc. Industries. The paper is organized into five sections. Section I provides the introduction about the large scale industry of Punjab and its contribution to employment. Section II defines the main objectives of the present study. Section III deals with data source, sample size & research methodology to be followed in the study. Section IV presents reports and analysis of the empirical results of the study. Section V summarizes and concludes the study.

Section IV-Empirical Results:

Table 4.1 depicts district wise distribution of employment in the large scale industries of Punjab for the period ranging from 2003-04 to 2013-14. Ludhiana(82559.64) recorded the highest mean score during the period under study followed by S.A.S. Nagar (34331.63), Kapurthala (16835.27), Patiala(16794.64), Hoshiarpur (14510.73), Sangrur(13832.91), Barnala (11928.75), Bathinda (7534.82), Jalandhar (7312.36), Amritsar (6931), Ropar (5873.27), Nawanshahar(5356.73), Gurdaspur(3046.73), Fatehgarh Sahib(2673.55), Muktsar(1942.18), Moga(1566.64) and Ferozepur (1203.64). During the same period, relatively lower mean scores in terms of employment were recorded in Faridkot (453.73), Tarn Taran (319.55) and Fazilka(284.27) followed by Pathankot(164.18) which showed the lowest mean score in terms of employment in the units of the district. Coefficient of variation is used to describe dispersion of the variable.



Table: 4.1 EMPLOYMENT: DISTRICT WISE IN LARGE SCALE INDUSTRIAL UNITS OF PUNJAB

District Year	Amritsar	Barnala	Bathinda	Faridkot	Fatehgarh Sahib	Fazilka	Ferozepur	Gurdaspur	Hoshiarpur	Jalandhar	Kapurthala
2003-04	10477	Nil	7149	641	2830	0	2608	4219	14163	10302	17405
2004-05	9337	Nil	7450	530	2091	0	1877	3507	11471	8851	16217
2005-06	8859	Nil	7823	547	2187	0	1823	3405	13316	8687	15703
2006-07	5910	11098	7112	160	1749	0	683	3394	13509	7355	17841
2007-08	5877	12635	7651	680	2086	0	1188	3265	13314	7379	17685
2008-09	5825	12647	8390	269	2675	0	1275	3290	14263	6306	16447
2009-10	5540	9929	7720	39	2532	0	1425	2892	14966	6105	16410
2010-11	6298	9763	7427	525	2593	71	1611	2196	15942	7338	16449
2011-12	6130	10711	7473	450	2964	1139	166	1799	16617	6134	16883
2012-13	6113	16843	7929	575	3616	1036	267	2838	15451	5934	17162
2013-14	5875	11804	6759	575	4086	881	317	2709	16606	6045	16986
Mean	6931.00	11928.75	7534.82	453.73	2673.55	284.27	1203.64	3046.73	14510.73	7312.36	16835.27
Std. dev	1738.34	2269.13	443.82	206.81	692.44	475.70	777.22	663.63	1589.08	1434.12	658.41
CV	25.08	19.02	5.89	45.58	25.90	167.34	64.57	21.78	10.95	19.61	3.91
CGR	-4.98	1.62	-0.07	-1.16	5.53	110.86	-19.33	-5.28	2.86	-4.88	0.08
t-value	1.221	0.305	3.495	1.395	1.432	1.47	0.304	1.838	1.138	1.115	1.271
Trend Coefficients											
A	9312.12	10856.89	7555.81	472.92	1754.72	200	2336.7	4018.34	12080.4	9598.91	16771.67
B	-396.85	238.19	-3.5	-3.2	153.13	232.7	-188.84	-161.93	405.16	-381.09	10.6
Predictions											
2020-21	2169	15144	7493	415	4511	4389	-1062	1104	19373	2739	16962

Contd.

District Year	Ludhiana	Mansa	Moga	Muktsar	Nawanshahar	Patiala	Pathankot	Roop Nagar	S.A.S. Nagar	Sangrur	Tarn Taran
2003-04	78951	0	1662	2711	4705	31285	0	15713	Nil	27976	0
2004-05	76538	0	1673	2192	5196	29133	0	14315	Nil	19161	0
2005-06	76073	0	1697	1508	5228	29547	0	15494	Nil	20798	0
2006-07	75331	0	1438	1636	5378	12077	0	2836	22882	8601	352

2007-08	79042	0	1440	1680	5436	12448	0	2820	34978	9501	351
2008-09	79832	0	1228	1895	5363	13012	0	2854	35272	8662	386
2009-10	88728	0	1336	1808	5498	12982	0	1778	35497	8647	163
2010-11	74707	0	1467	1908	5994	11216	444	2604	33000	8821	446
2011-12	89797	0	1784	1979	6103	11053	455	1595	45253	9541	563
2012-13	94723	0	1696	1983	5833	10028	484	2323	34116	10698	645
2013-14	94434	0	1812	2064	4190	11960	423	2274	33655	19756	609
Mean	82559.64	0.00	1566.64	1942.18	5356.73	16794.64	164.18	5873.27	34331.63	13832.91	319.55
Std. dev	7774.74	0.00	192.86	323.07	551.82	8532.71	228.22	5996.89	6039.25	6820.18	245.41
CV	9.42	0.00	12.31	16.63	10.30	50.81	139.00	102.10	17.59	49.30	76.80
CGR	2.15	0.00	0.55	-0.51	0.52	-10.44	-0.39	-19.89	3.95	-5.70	11.33
t-value	1.179	0	1.41	1.493	1.323	-0.23	-1.52	-4.53	0.865	0.751	1.03
Trend Coefficients											
A	71663.36	0	1508.98	2050.51	5144.43	29324.54	460	14511.41	29052.32	19785.83	220.64
B	1816.04	0	9.61	-18.05	35.38	2088.31	-3.4	-1439.69	1173.17	-992.15	48.61
Predictions											
2020-21	104352	0	1682	1726	5781	66914	399	-11403	50169	1927	1096

Source: Directorate of Industries and Commerce, Punjab

CV regarding employment in the large scale industries of Punjab has been recorded a highest in Fazilka(167.34 percent), Pathankot (139 percent) followed by Roopnagar/Ropar (102.10 percent), Tarn Taran(76.80 percent), Ferozepur(64.57 percent), Sangrur(49.30 percent), Patiala (50.81 percent), Fatehgarh Sahib(25.90 percent), Amritsar(25.08 percent), Gurdaspur(21.78 percent), Barnala(19.02 percent), S.A.S. Nagar (17.59 percent), Muktsar (16.63 percent), Moga (12.31 percent), Kapurthala (3.91 percent). Bathinda recorded a lowest coefficient of variation 5.89 percent. Therefore, least degree of dispersion is found in Bathinda district indicating data is less variable or more stable than the data with higher CV in other districts. Table 4.1 exhibits that the employment in Fazilka district registered a significant increase from 71 persons employed in 2010-11 to 881 persons employed in 2013-14 at the rate of CAGR of 110.86 which tends out to be significant (t-value=1.47 at five percent level). Hence, the number of persons employed in the large scale industries of this district grew significantly over a few number of years only from the year it was made the district of Punjab (in 2010-11). The lowest growth rate in the employment has been seen in the Roopnagar/Ropar district where the number of persons employed has decreased significantly from 15713 persons in 2003-04 to only 2274 persons employed in 2013-14 at the rate of negative CAGR of -19.89 percent which has been found to be insignificant. (t-value= -4.53). Keeping in view the existing trend equation, it can be predicted that employment in the units of Patiala, Fazilka, Tarn Taran , S.A.S. Nagar, Nawanshahar, Barnala, Hoshiarpur, Bathinda, Ludhiana and Fatehgarh Sahib is expected to increase by 2020-21 to 66914 persons, 4389 persons, 1096 persons, 50169 persons, 5781 persons, 15144 persons, 19373 persons, 7493 persons, 104352 persons, 4511 persons, respectively. On the other hand, employment in Sangrur, Amritsar, Gurdaspur, Jalandhar, Faridkot, Muktsar, Moga, Pathankot and Kapurthala is expected to decrease to 1927 , 2169 , 1104 , 2739 , 415, 1726 , 1682 , 399 and 16962 persons respectively in the year 2020-21. Conversely, it can be projected that employment in the units of Ferozepur and Roopnagar/Ropar are expected to decline significantly by year 2020-21. Thus, employment in the units of Fazilka district is expected to rise significantly from 881 persons employed in 2013-14 to 4389 persons to be employed in the year 2020-21, but employment in the units of Fatehgarh Sahib has showed least expected increase in the number of persons to be employed by the year 2020-21, i.e. from 4086 persons employed in 2013-14 in the units of this district, to only 4511 persons expected to be employed in the year 2020-21. Table 4.2 shows the industry wise distribution of employment in the large scale industrial units

Table 4.2 LARGE SCALE INDUSTRIES PUNJAB - INDUSTRY WISE – EMPLOYMENT

Industry Year	D1	D2	D3	D4	D5	D6	D7	D8
2003-04	32550	7299	59823	12815	2232	8524	Nil	19487
2004-05	26872	7014	60124	10440	1403	6856	Nil	12705
2005-06	25421	6134	60935	11218	1392	6962	Nil	12679
2006-07	21462	5998	64504	10363	618	5637	Nil	11827
2007-08	20526	6568	76787	10826	752	6226	159	13961
2008-09	19879	7330	75005	10705	628	6560	249	13879
2009-10	26200	7374	70000	7128	0.01	6484	204	19743
2010-11	25555	NIL	81496	1787	26	6110	137	12078
2011-12	26604	NIL	98674	2783	28	6901	26	12744
2012-13	25840	NIL	90746	4019	451	7005	110	19785
2013-14	25291	NIL	100349	4728	180	7987	110	12470
Mean	25109.09	6816.71	76222.09	7892.00	700.91	6841.09	142.14	14668.91
Std. dev.	3527.37	583.64	15048.44	3916.44	711.54	822.18	72.01	3277.29
CV	14.05	8.56	19.74	49.63	101.52	12.02	50.66	22.34
CAGR	-0.62	0.67	5.66	-14.26	-34.42	-0.06	-15.75	-0.05
t Value	-0.45	0.38	8.53	-3.58	-1.30	-0.05	-1.30	-0.03
Trend Coefficients								
A	26364.40	Nil	50829.44	14016.04	1797.06	6899.35	228.29	14684.51
B	-209.22	Nil	4232.11	-1020.67	-182.69	-9.71	-21.54	-2.60
Predictions								
2020-21	22598	0	127007	-4356	-1491	6725	-73	14638

From 2010-11 onwards, D1 and D2 industries were combined.

Contd.

Industry Year	D9	D10	D11	D12	D13	D14	D15	D16
2003-04	16064	699	12500	2602	6564	6194	38529	6915
2004-05	14088	731	13244	1724	6719	4599	36346	6664
2005-06	14434	830	13389	1935	8931	4567	35877	7991
2006-07	15401	521	9858	2215	8168	3234	33628	5908
2007-08	14926	659	12199	3069	5570	2520	37699	7009
2008-09	15268	690	12466	3625	6937	2433	37237	7000

2009-10	14234	697	19209	2893	7628	2912	33599	5690
2010-11	10667	713	15176	2757	6182	4244	37799	6093
2011-12	8160	767	16305	4701	3707	3742	49065	4382
2012-13	10381	1319	16983	5842	3906	3021	44013	6872
2013-14	10126	1332	15353	6213	3884	3130	48063	4604
Mean	13068.09	814.36	14243.82	3416.00	6199.64	3690.55	39259.55	6284.36
Std. dev.	2696.40	263.64	2642.96	1529.48	1776.35	1126.87	5377.01	1086.79
CV	20.63	32.37	18.56	44.77	28.65	30.53	13.70	17.29
CAGR	-5.33	5.64	3.64	11.81	-6.74	-4.45	2.70	-3.45
t Value	-4.06	2.49	2.46	5.29	-3.39	-1.85	2.74	-2.44
Trend Coefficients								
A	17077.18	500.73	11210.27	1030.56	8503.53	4873.91	32597.15	7511.58
B	-668.18	52.27	505.59	397.57	-383.98	-197.23	1110.40	-204.54
Predictions								
2020-21	5050	1442	20311	8187	1592	1324	52584	3830

Source: Directorate of Industries and Commerce, Punjab

of Punjab for the period ranging from 2003-04 to 2013-14. D3 having the highest number of industrial units in Punjab recorded highest mean score (76222.09) during the period under study, signifying maximum number of persons employed in the units of this industry. This has been followed by D15 (39259.55), D1 (25109.09), D8 (14668.91), D11 (14243.82), D9 (13068.09), D4 (7892), D6 (6841.09), D16 (6284.36), D13 (6199.64), D14 (3690.55), D12 (3416). On the other hand, D10 (814.36) showed relatively lower mean score with D7 (142.14) having the lowest mean score in terms of the number of persons employed in the units of this industry during the relevant period. Coefficient of variation which is used to describe the dispersion among the variables, has been recorded maximum in D5 (101.52 percent), D7 (50.66 percent), D4 (49.63 percent), D4 (49.63 percent), D12 (44.77 percent), D7 (50.66 percent), D10 (32.37 percent), D14 (30.53 percent), D13 (28.65 percent), D8 (22.34 percent), D9 (20.63 percent), D3 (19.74 percent), D11 (18.56 percent), D16 (17.29 percent), D15 (13.70 percent), D1 (14.05 percent). D6 recorded lowest coefficient of variation of 12.02 percent. Therefore, least degree of dispersion is found in D2 indicating that the data is less variable or more stable in comparison to D5, in which highest variation in the data has been found. Table 4.2 exhibits that number of persons employed in the units of various industries. The number of persons employed in D12 has increased from 2602 persons in 2003-04 to 6213 persons in 2013-14 at the highest rate of CAGR of 11.81 percent which tends out to be highly significant (t-value=5.29 at five percent level), showing that maximum growth in the employment has taken place in the units of this industry among the number of persons employed in the units all the other industries. The least growth in the number of units has been witnessed in D2 where the number of persons employed in the industry have increased from 7299 persons employed in 2003-04 to 7374 persons employed in 2009-10 at CAGR of 0.67 percent, but this growth indicates the increase in the number of persons employed in this industry up to the year 2009-10 only because after that this industry was combined with the D1 industry from the year 2010-11. Alternatively, the number of persons employed in the units of D5 industry reduced from 2232 persons employed in 2003-04 to 180 persons employed in the units of this industry in the year 2013-14 at negative CAGR of -34.42 percent (t-value=-1.30). From the point of view of the trend equation, the employment among various units of industries is expected to increase in the year 2020-21 except in the units of D5, D7, D4, D13, D14, D9 and D6, as the units of these industries are also expected to decline by the year 2020-21. No doubt, the units of D11 are expected to decline by the year 2020-21, but the employment in the units of this industry is likely to rise more in comparison to other industries. The numbers of persons in this industry are expected to increase from 15353 persons employed in 2013-14 to 20311 persons expected to be employed in 2020-21. This is expected to be followed by D12, D3, D8, D15 and D10 where the numbers of persons employed are expected to increase to 8187 persons, 127007 persons, 14638 persons, 52584 persons and 1442 persons in the year 2020-21 respectively. The employment in the units of D4, D5 and D7 is expected to decline significantly by the year 2020-21.

Section V-Summary & Conclusions:

The study is confined to large scale industrial units of Punjab. The study covers district wise distribution of employment in the large scale industries of Punjab for the period ranging from 2003-04 to 2013-14 during the period under study. The following are the conclusion and findings of the present study regarding large scale industry of Punjab and its contribution to employment.

- (1) the employment in Fazilka district registered a significant increase from 71 persons employed in 2010-11 to 881 persons employed in 2013-14 at the rate of CAGR of 110.86 which tends out to be significant (t-value=1.47 at five percent level)
- (2) The lowest growth rate in the employment has been seen in the Roopnagar/Ropar district where the number of persons employed has decreased significantly from 15713 persons in 2003-04 to 2274 persons employed in 2013-14 at the rate of negative CAGR of -19.89 percent which has been found to be insignificant. (t-value= -4.53).
- (3) Keeping in view the existing trend equation, it can be predicted that employment in the units of Patiala, Fazilka, Tarn Taran , S.A.S. Nagar, Nawanshahar, Barnala, Hoshiarpur, Bathinda, Ludhiana and Fatehgarh Sahib is expected to increase by 2020-21 to 66914 persons, 4389 persons, 1096 persons, 50169 persons, 5781 persons, 15144 persons, 19373 persons, 7493 persons, 104352 persons, 4511 persons, respectively. On the other hand, employment in Sangrur, Amritsar, Gurdaspur, Jalandhar, Faridkot, Muktsar, Moga, Pathankot and Kapurthala is expected to decrease to 1927 , 2169 , 1104 , 2739 , 415, 1726 , 1682 , 399 and 16962 persons respectively in the year 2020-21. Conversely, it can be projected that employment in the units of Ferozepur and Roopnagar/Ropar are expected to decline significantly by year 2020-21. Thus, employment in the units of Fazilka district is expected to rise significantly from 881 persons employed in 2013-14 to 4389 persons to be employed in the year 2020-21, but employment in the units of Fatehgarh Sahib has showed least expected increase in the number of persons to be employed by the year 2020-21, i.e. from 4086 persons employed in 2013-14 in the units of this district, to only 4511 persons expected to be employed in the year 2020-21.
- (4) It is observed that the number of persons employed in D12 has increased from 2602 persons in 2003-04 to 6213 persons in 2013-14 at the highest rate of CAGR of 11.81 percent which tends out to be highly significant (t-value=5.29 at five percent level), showing that maximum growth in the employment has taken place in the units of this industry as compared to the number of persons employed in the units of other industries.
- (5) It is revealed that the least growth in the number of units has been witnessed in D2 where the number of persons employed in the industry have increased from 7299 persons employed in

2003-04 to 7374 persons employed in 2009-10 at CAGR of 0.67 percent, but this growth indicates the increase in the number of persons employed in this industry up to the year 2009-10 only because after that this industry was combined with the D1 industry from the year 2010-11.

- (6) It is observed that the number of persons employed in the units of D5 industry reduced from 2232 persons employed in 2003-04 to 180 persons employed in the units of this industry in the year 2013-14 at negative CAGR of -34.42 percent (t-value=-1.30).
- (7) It is also observed that from the point of view of the trend equation, the employment among various units of industries is expected to increase in the year 2020-21 except in the units of D5, D7, D4, D13, D14, D9 and D6, as the units of these industries are also expected to decline by the year 2020-21.
- (8) It is revealed that numbers of persons in this industry are expected to increase from 15353 persons employed in 2013-14 to 20311 persons in 2020-21. This is expected to be followed by D12, D3, D8, D15 and D10 where the numbers of persons employed are expected to increase to 8187 persons, 127007 persons, 14638 persons, 52584 persons and 1442 persons in the year 2020-21 respectively. But the employment in the units of D4, D5 and D7 is expected to decline significantly by the year 2020-21.

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