Performance Appraisal in Light Engineering Industry in Uttar Pradesh

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Abstract

Uttar Pradesh holds an important place in the global economy and most populous state and third-largest contributor to Gross Domestic Product conversely per capita income is half to the to the national average. The small scale industries play a crucial role in generating large scale employment opportunities through low capital industrialization to reduce regional imbalance, equitable national income and wealth distribution. MSMEs are an important segment of the UP economy in employment generation and foreign exchange earnings through exports and import substitutes. Academician and policy makers are in process to predict economic and social growth, scientific research to generate reliable detailed data distribution and composition. In this endeavours Number of Factories, Input-Output Ratio of Total Output to Total Input, Employment expressed in Total Number of Workers and Total Persons Engaged are variables. The performances as an algebraic average of the year 1993-2006 (Economic-reform era-I) to the year 2007-2018 (Economic-reform era-II) were evaluated. The study reveal The growth performance Reform-I era to the Reform-II era was positive in the total number of factories at 9.50%, employment expressed in a total number of workers at 18.67% and total persons engaged 15.27% nevertheless overall input-output ratio was negative -7.15%.The number of factories performance was as positive in Fabricated Metal Products Except Machinery and Equipment, Electrical Equipment, Machinery and Equipment not excluded in classification, Other Transport Equipment and Furniture conversely negative in Basic Metals, Computer Electronic and Optical Products, Motor Vehicles Trailers and Semi-trailers. An Input-Output Ratio growth performance trends were positive in Fabricated Metal Products Except Machinery and Equipment, Electrical Equipment, Motor Vehicles Trailers and Semi-trailers, and Furniture conversely negative in Basic Metals, Computer Electronic and Optical Products, Machinery and Equipment not excluded in classification and Other Transport Equipment. An employment growth performance trends expressed in a total number of workers were positive in Basic Metals, Fabricated Metal Products Except Machinery and Equipment,

Electrical Equipment, Motor Vehicles Trailers and Semi-trailers, and Furniture conversely negative in Computer Electronic and Optical Products, Machinery and Equipment not excluded in classification and Other Transport Equipment, and total persons engaged were positive in Basic Metals, Fabricated Metal Products Except Machinery and Equipment, Computer Electronic and Optical Products, Electrical Equipment, Machinery and Equipment not excluded in classification, Motor Vehicles Trailers and Semi-trailers conversely negative in Other Transport Equipment and Furniture. This performance appraisal senses are not clear for instance industries indicators inclusive initiative and variables thereafter depth monitoring, governance, administration, specific norms, standards and guidelines should be established and implemented.

Keywords: Number of Factories, Input-Output Ratio, Total Output to Total Input, Total Number of Workers and Total Persons Engaged, Employment Growth, Light Engineering Industries.

Introduction

Uttar Pradesh (UP) holds an important place in the global economy. Apart from being the most populous state and third-largest contributor to Gross Domestic Product (GDP) i.e.8% conversely per capita income to the national average gap is 50% due to slow growth and major contribution by agriculture in Gross State Domestic Product (GSDP). The manufacturing sector GSDP declined from 12.9% to 10.3% from 2011-2018, output per worker is lower around 50% and wages are lower 14.0% than the all-India level of 2015-2016.(1)

The UP government consulted with 200 industries and other stakeholders across the state working on 11 priorities for development in employment, value-added, investment labour-intensive manufacturing as electronics, automotive, leather, textiles, apparel, and food processing. All these contribute about 73% of the manufacturing output and 75% of the total employment. (2)

UP had the largest number of MSMEs in the country at 8.99 million shares14.20% about 60% manufacturing, 44% total exports, (handicrafts 39%, carpet 26%, and leather goods).(3) The centre and state governments implemented interventions to support cluster-based development of infrastructure to access modern technology, markets, finance and skills however around 30% of MSMEs units are unaware. West Bengal stands second with about 14%, remaining top 10 states accounted for 74.05% of the total number in the country. The government encouraged growth in transport, logistics, electricity, urban and skill development in identifying priority districts and regions to enable structural change, remove regional imbalances, employment generation by MSMEs network anchored by large companies. There are 6 employment zones, 5 Brownfield

zones (Western, Northern, South-Western, Central and Eastern) and 1 Greenfield zone (Bundelkhand) in 19 districts. (4)

The MSME development cell in each district enables environment for infrastructure, revenue increase, effective policy interventions implementation, technology adoption, marketing assistance, Uttar Pradesh Nirman branding, capacity building, and working as the apex body for ease of doing business within the district. They endorse long-term market support to connect units with local, domestic and global supply chains for additional value-addition, employment and investment priority in leather, electronics, food processing, aerospace and defence.

The MSMEs manufacturing sector industrial parks, common facilities and skills training centres to improve the competitiveness, road and power connectivity at major consumption centres, inland container depots, ports, etc. gateways for domestic and international markets, employment generation, electricity networks, improved transport, utilities and skilling solutions for economic growth at the large geographic spread, logistics planning and cost optimization are established.

Uttar Pradesh has a strong high expressways network, rail and road connectivity, logistics and warehousing facilities, inland container depots, cold storage connected to industrial estates and updated technology.

The urban population is projected to 66.7 million by 2021 therefore, state urban planning manages increasing city densities, tapping the synergy between urbanization and industrialization on long-term for employment, arsenic and fluoride contamination-free water supply, upgraded sewerage and drainage.

The electricity consumption yearly growth is 6% and fulfils about 86% of requirements rest 14% deficits by alternate energy sources with compatible distribution networks to industrial feeders and substations.

UP shares 16.2% of the country population while only 7.3 % of the area, Due to the formation of the new state Uttarakhand area reduced by 18% against a 5 % reduction in population. The Census prediction 153 million working-age people by 2026 will become a valuable source to the global economy by skilled and semi-skilled training.

UP MSMEs has lack skill and trained person approximately 1.2 million each year and estimated that from years 2018 and 2028 approximately 15.8 million skilled or semi-skilled jobs will be generated.

Overall our state is home to around 22 million with 30% of the population below the poverty line so economic growth for employment generation is necessary. In this context manufacturing (especially MSMEs) with high employment growth at low capital investment is compulsory. (5)

The large numbers of references are available on growth and employment in small scale Uttar Pradesh manufacturing industry since independence and restructuring of the state. This

endeavour is a descriptive cum diagnostic exemplar study to identify, investigates, discuss and conclude performance appraisal of Number of Factories, Input-Output Ratio (Total Output to Total Input), Employment expressed in Total Number of Workers and Total Persons Engaged in instantly recognizable light engineering industries since 1991. These conclusions countenance can reveal benchmark for manufacturing units of UP also for other states, populations, individuals and industry groups.

Research Methodology

The secondary data of National Industrial Classification (NIC) classified Light Engineering Goods Industries are chosen to review performance appraisal trends and tendencies. The exemplar light engineering industries are Basic Metals code 240, Fabricated Metal Products Except Machinery code 250, Computer Electronic and Optical Products code 260, Electrical Equipment code 270, Machinery and Equipment not excluded in classification code 280, Motor Vehicles Trailers and Semi-trailers code 290, Other Transport Equipment code 300 and Furniture code 310 are selected.

The Results, Discussions and Conclusions can predict economic and social growth, scientific research to generate reliable detailed data, distribution and composition.

The following variables are selected

1. Number of Factories in Light Engineering Industries.
2. Input-Output Ratio of Total Output to Total Input in Light Engineering Industries.
3. Employment expressed in Light Engineering Industries.
    a. Total Number of Workers and
    b. Total Persons Engaged

All variables performances were reckoned as follows;

a. An algebraic average of the year 1993-2006 (Economic-reform era-I)
b. An algebraic average of the year 2007-2018 (Economic-reform era-II).
c. The arithmetical calculation maximum, minimum and average of the selected light engineering industries variables.

In our study "A Study of growth and employment in small scale manufacturing industry in Uttar Pradesh since 1991" Single-Factor Productivity Measurement model was adopted to discuss and conceal conclusions.

The 3D bar diagrams are drawn in correlation to the time zone 1993-2006 Economic-reform era-I, and time zone 2007-2018 Economic-reform era-II, Maximum, Minimum and Average to discussed trends and tendencies for conclusions.

Number of Factories in Light Engineering Industries

The small scale light engineering manufacturing registered unit was indices as per Factories Act-1948. The act under section 2(m) demarcated Factory such as any premises including the precincts thereof (i) whereon least 10 or more workers are working or were working on any day of the preceding 12 months, and in any part of which a manufacturing process is being carried on with power, or is ordinarily so carried on, or (ii) whereon 20 or more workers are working or were working on any day of the preceding 12 months, and in any part of which a manufacturing process is being carried on without power, or is ordinarily so carried on. This does not include mining governed under Mines Act, 1952, armed forces of the union mobile unit, railway running shed, a hotel, and restaurant or eating place.(6)

The Directorate General Factory Advice Service & Labour Institutes (DGFASLI) Ministry of Labour and Employment, Government of India and in State Governments through their factory inspectorates enforces it.

The Annual Survey of Industries(ASI) states that "Primary unit of enumeration in the survey is a factory, manufacturing ventures, workshop of repair services, electricity, gas and water supply undertakings even bidi and cigar industries" etc. Secondly, the reference period for ASI is the "accounting year of the industrial unit ending on any day during the fiscal year". The escalation in factories number in a particular accounting year in comparison to the previous year specifies new factories have registered in a particular year under section 2m(i) and 2m (ii) of the Factories Act, 1948.(7)
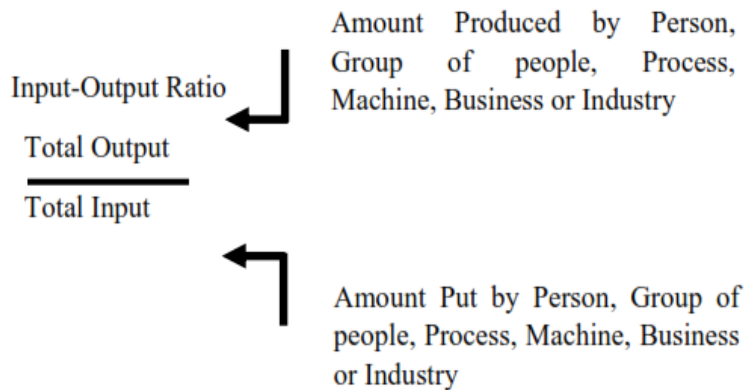
The Number of Factories in Light Engineering Industries of the entire era of the study was tabulated on the algebraic average of years 1993-2006 (Economic-reform era-I after reform and before MSME act-2006) and the year 2007-2018 (Economic-reform era-II after MSME act-2006).

Input-Output Ratio in Light Engineering Industries

The ratio between the output and inputs is crucial statistical information of performance to measures growth and competitiveness of industry and economy as an input-output ratio.

There are numerous performance appraisal simulations are available and adopted by the Econo-mathematician depends on the availability and purpose of data. The Nobel Prize winner Leontief in the 1930s used input-output based simulation for a wide range of applications including regional and local impact analysis. The fundamental perception is that the output (sell their products to other producing sectors or final demanders as, households, government, or households and firms in other regions) requires inputs (raw materials, semi-manufactured goods or services i.e. households supply labour). The input-output linkages require a large amount of at least 20 years or more data. These econometric models deal with two major problems, first data availability over such a long period and secondly the data consistency of the set (authorities

amend data guidelines and ranges). The total output of a sector accounted for by the inputs used in production any excess of the value of gross output over inputs is growth or loss.

Input-Output Ratio ← Amount Produced by Person, Group of people, Process, Machine, Business or Industry

$$\frac{\text{Total Output}}{\text{Total Input}}$$

← Amount Put by Person, Group of people, Process, Machine, Business or Industry

It is expressed mathematically as the ratio of output to inputs used in a production process

$$P = \frac{O}{I}$$

Where P= Productivity

O= Output

I= Input

The unit productivity is evaluated as a total o f output per one unit of a total input as

$$\text{Unit Productivity} = \frac{\text{Units of Output}}{\text{Units of Inputs}}$$

The single productivity factor of each variable is separately measured nevertheless more than one variable measurement is the multi-factor productivity approach. The Total productivity (total productivity index) refers to all resources. The broadly used Econo-practice are listed as under

1. Single-Factor Productivity Measurement.
2. Multi-Factor Productivity Measurement.
3. Total (Composite) Factor Productivity Measures.
4. Total Productivity Model.

Total Input in Light Engineering Industries

In an industry total input includes value of raw materials, power cost, wages to workers and employees, repair and maintenance cost of fixed assets, others work on fixed assets, freight and

transport expenses, direct and indirect taxes, postage, telephone, insurance, banking, stationery, printing, and advertisement etc.

Total Output in Light Engineering Industries

The total output comprises ex-factory value of products and by-products manufactured as well as another receipt such as non-industrial services render to others work done for material supplied by them, electricity value produced and sold, the value of goods sold in the same conditions as purchased, addition in stock of semi-finished goods and own constructions.(8)

In our study "A Study of growth and employment in small scale manufacturing industry in Uttar Pradesh since 1991" Single-Factor Productivity Measurements simulations were adopted to discuss and reveal conclusions.

Employment in Light Engineering Industries

Employment generation is a prime priority of our country. The strategies and transformative initiatives for industrialization are, Make in India, Skill India, and Startup India etc. The Ministry of Labour and Employment, Govt of India is committed to the job, wage and social securities for each citizen and bringing reforms in labour laws enforcement with accountability.

Manufacturing contributes 55 to 57% of national industrial production has great sustainable augmentation potential in employment generation, domestic supply, and exports.

The employment generation is the accountability of the State Nevertheless Government of India, supplements synergy to encourage entrepreneurship, employment, livelihood opportunities and to enhance the competitiveness of MSMEs in the globalized economy to State Governments through various initiatives.

The MSMEs generates the largest employment opportunities for the populace since the colonial era next only to agriculture. Its contribution to the economic and social scenario by fostering entrepreneurship, low investment employment generation complementary to large industries as ancillary and fast industrial growth. It also creates industrialization of rural and backward areas to reduce regional imbalances, assuring a more equitable distribution of national income and wealth. This sector overall contributes sustainable higher economic growth in building an inclusive society through low-cost non-farm livelihood, balanced regional, gender and social, environment-friendly recession-proof economic growth.

It is estimated that one lakh rupees investment in small scale sector generates employment for four persons. This contributes to the country economy for 45% of manufacturing output, 40% of the total exports and estimated employment is about 60 million individuals in over 26 million units produces over 6000 products traditional to high-tech items. Apart from employment, it offers opportunities for both self-employment and wage-employment outside the agriculture sector.

The 73rd National Sample Survey (NSS) year 2015-2016 incorporated a person working within the premises of the enterprise includes working owners, persons on the payroll of the enterprise, unpaid family members engaged in entrepreneurial activities, other helpers and apprentices are workers.

This survey reported there were 11.13 crore workers engaged in nonagricultural enterprises (excluding construction) includes 55% from urban and 45% from rural areas. These jobs comprise 360.41 lakh in Manufacturing, 387.38 lakh in Trade, and 364.85 lakh in Other Services, and 0.07 lakh in Non-captive Electricity Generation and Transmission in rural and the urban areas.

The own account enterprises (OAEs) accounted for 62.1% of the total workforce in the unincorporated non-agricultural sector excluding construction. There are 630.52 lakh Micro units that employ 1076.19 lakh persons i.e. 97%, 3.31 lakh Small units employ 31.95 lakh i.e. 2.88%, and 0.05 lakh Medium units provide employment to 1.75 lakh i.e.0.16% of total employment. Out of 1109.89 lakh employees, 844.68 lakh i.e. 76% are male and the remaining 264.92 lakh i.e. 24% are females.(10)

In our study for employee performance appraisal variables, Total Number of Workers and Total Persons Engaged were chosen to discuss and reveal conclusions

➢ Total Number of Workers in Light Engineering Industries

The ASI demarcated Total Number of Workers in the manufacturing process are all persons employed directly, indirectly or through the agency for wages or without wages, cleaning of machinery or other related works.

➢ Total Persons Engaged in Light Engineering Industries

The ASI demarcate that all persons engaged in the manufacturing process directly, indirectly or through the agency for wages or without wages, cleaning part of the machinery or premises, any other caring work incidental to or connected. The labourers are those involved in the repair and maintenance, installation, production, generating electricity, producing coal, gas or any fraction of exertion.

Employees are workers and persons include others all on wages and holding clerical, supervisory, managerial positions in the administrative office, storekeeping, welfare, sales, and purchase and security staff etc.

Total Persons Engaged demarcated as working proprietors with family members directly or indirectly engaged in the factory even without wages and salary, unpaid members of the co-operative societies in direct productive capacity. An average number of workers or employees are arithmetically calculated by dividing man-days worked by the number of days the factory had worked during the reference year.

Results and Discussions

The re-produced secondary data are tabulated, compared and analyzed inside and outside selected industries groups in consonance to a time slot, published-unpublished data and theories to establish conclusions on the followings;

1. Number of Factories in Light Engineering Industries.
2. Input-Output Ratio in Light Engineering Industries.
3. Employment in Light Engineering Industries expressed.
   a. Total Number of Workers.
   b. Total Persons Engaged.

The Number of Factories, Input-Output Ratio with Total Input and Total Output, Employment expressed in Total Number of Workers and Total Person Engaged is tabled in Table 5.1, Table 5.2, Table 5.3, and Table 5.4., the 3D bar diagrams are drawn as in Y-axis variables and X-axis light engineering industries to the time zone 1993-2006 Economic-reform era-I, and time zone 2007-2018 Economic-reform era-II, Maximum, Minimum and Average are in Fig 5.1., Fig 5.2., Fig 5.3i.,and Fig 5.3ii., respectively.

Number of Factories in Light Engineering Industries

The Table 5.1 *(end of the paper)* and Figure 5.1 indicates that the light engineering industries number of factories of, Basic Metal were maximum 861 in 1999-2000, minimum 276 in 1996-1997, total average 649, reform-I average 705 and reform-II average 576, Fabricated Metal Products except Machinery and Equipment were maximum 1359 in 2016-2017, lowest 273 in 1996-1997, total average 726, reform-I average 546 and reform-II average 955, Computer Electronic and Optical Products were maximum 841 in 1999-2000, lowest 431 in 1996-1997, average total 544, reform-I average 599 and reform-II average 475, Electrical Equipment were maximum 738 in 1998-1999 lowest 230 in 1993-1994, total average was 445, reform-I average 389 and reform-II average 516, Machinery and Equipment were highest 846 in 2017-2018 lowest 156 in 2000-2001, average total 533, reform-I average 472 and reform-II average 611, Motor Vehicle Trailers and Semi-Trailers were maximum 647 in 2006-2007 lowest 117 in 2007-2008, average total 336, reform-I average 406 and reform-II average 246 Other Transport Equipment were maximum278 in 2017-2018 lowest 138 in 1993-1994, average total was 191, reform-I average 176 and reform-II average 210 and Furniture Industries were maximum 284 in 2008-2009 lowest 169 in 1993-1994 average total was 217, reform-I average 201 and reform-II average 237.

The maximum numbers of factories 1359 were in Fabricated Metal Products except for Machinery and Equipment in 2016-2017, the minimum numbers of factories 117 were in Motor Vehicle Trailers and Semi-Trailers in 2007-2008, the average number of factories maximum were 726 of Fabricated Metal Products except for Machinery and Equipment and lowest were 191 of other Transport Equipment.

The average number of factories in the reform-I era, Basic Metals was maximum 705 however Other Transport Equipment were minimum 176 and in reform-II era Fabricated, Metal Products except for Machinery and Equipment were maximum 955 however Other Transport Equipment number of factories were minimum 210. The growth trends % were in Basic Metals -18.30, Fabricated Metal Products Except Machinery and Equipment 74.91, Computer Electronic and Optical Products -20.70, Electrical Equipment 32.65, Machinery and Equipment not excluded in classification 29.45, Motor Vehicles Trailers and Semi-trailers -39.41, Other Transport Equipment 19.32 and Furniture 17.91. The total numbers of factories were 3424 in the reform-I era nevertheless in 3826 reform era –II.

Overall growth trend and tendencies were positive in Fabricated Metal Products Except Machinery and Equipment 74.91, Electrical Equipment 32.65, Machinery and Equipment not excluded in classification 29.45, Other Transport Equipment 19.32 and Furniture 17.91 and adverse in Basic Metals -18.30, Computer Electronic and Optical Products -20.70, Motor Vehicles Trailers and Semi-trailers -39.41. The 9.50% growth showed from the reform-I era to the reform II era.
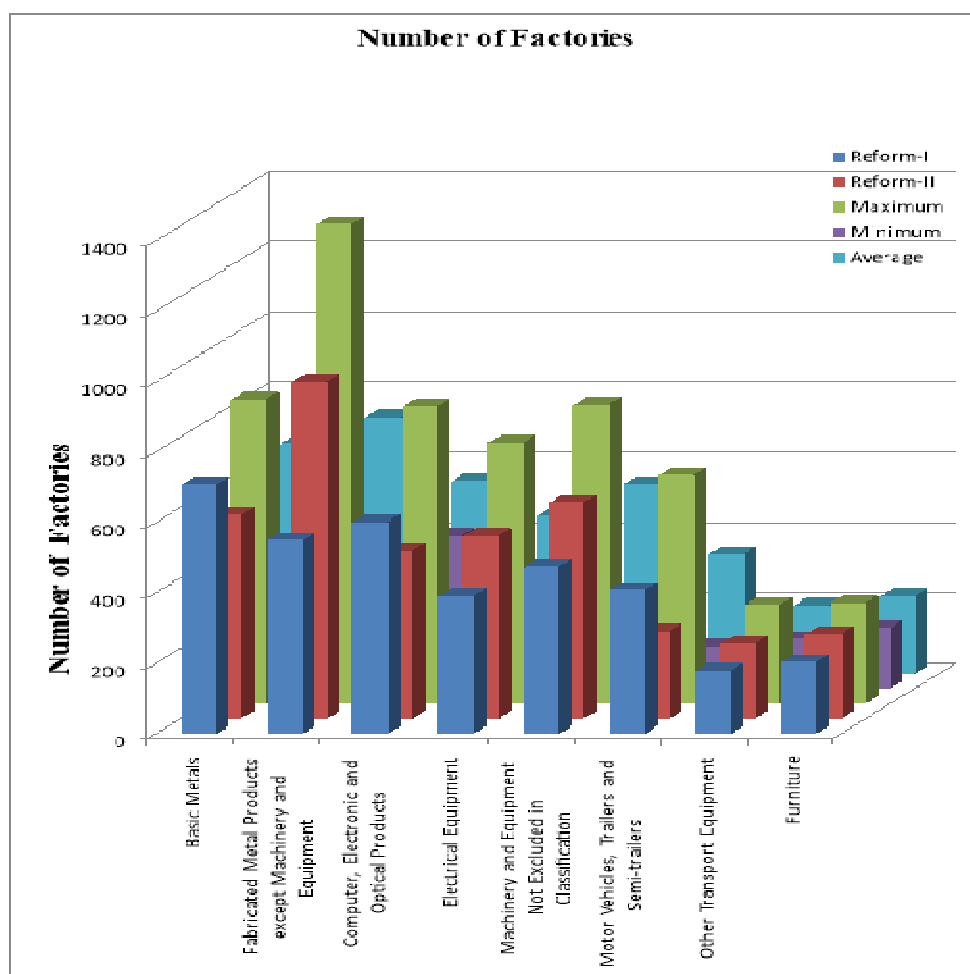

Figure 5.1.Number of Factories in Light Engineering Industries

Input-Output Ratio in Light Engineering Industries

The Table 5.2 *(end of the paper)* and Figure 5.2 indicates that the light engineering industries Input-Output Ratio of Basic Metal were maximum 292.93 in 1997-1998, minimum were 106.27 in 2006-2007, total average 212.53, reform-I average 140.32 and reform-II average 119.34, Fabricated Metal Products except Machinery and Equipment were maximum 139.70 in 1994-1995, lowest 115.76 in 2004-2005, total average 123.82, reform-I average 123.84 and reform-II average 123.79, Computer Electronic and Optical Products were maximum 161.99 in 2004-2005, lowest 107.95 in 2006-2007, average total 126.82, reform-I average 134.39 and reform-II average 117.20, Electrical Equipment were maximum 159.93 in 2006-07 lowest 099.56 in 2003-2004, total average was 125.84, reform-I average 123.06 and reform-II average 129.36, Machinery and Equipment were highest 185.35 in 1994-1995 lowest 076.81 in 2008-09, average total 132.22, reform-I average 140.06 and reform-II average 121.47, Motor Vehicle Trailers and Semi-Trailers were maximum 138.15 in 1996-1997 lowest 077.76 in 2000-2001 average total 120.45, reform-I average 118.64 and reform-II average 122.75 Other Transport Equipment were maximum 240.50 in 2000-2001, lowest 081.90 in 2009-2010, average total was 129.92, reform-I average 143.39 and reform-II average 112.66 and Furniture Industries were maximum 273.43 in 2007-2008, lowest 104.79 in 20016-2017 average total was 143.49, reform-I average 142.84 and reform-II average 144.32.

The Input-Output Ratio maximum 292.93 was in Basic Metal in 1997-1998 conversely the minimum 76.81 were in Machinery and Equipment not included in Classification in 2008-2009, the average maximum were 212.53 of Basic Metal and lowest were 120.45 of Motor vehicle Trailers and Semi-Trailers.

The Input-Output Ratio average of reform-I era Furniture was maximum 143.39 however Motor vehicle Trailers and Semi-Trailers were minima was 118.64 and average in a reform-II maximum of Furniture 144.32 however Other Transport Equipment Input-Output Ratio were minimum 112.66. The Input-Output Ratio growth trends % were in Basic Metals -14.95, Fabricated Metal Products Except Machinery and Equipment 0.04, Computer Electronic and Optical Products -12.79, Electrical Equipment 5.12, Machinery and Equipment not excluded in classification -13.64, Motor Vehicles Trailers and Semi-trailers 3.46, Other Transport Equipment -21.43 and Furniture 1.04. The total Input-Output Ratio was 3424 in the reform-I era however in 38256 reform era –II.

Overall growth trend and tendencies in Input-Output Ratio were positive Electrical Equipment 5.12, Motor Vehicles Trailers and Semi-trailers 3.46, and Furniture 1.04. however adverse in Basic Metals -14.95, Computer Electronic and Optical Products -0.04, Machinery and Equipment not excluded in classification -13.64, and Other Transport Equipment -21.43 The Input-Output Ratio growth was negative of -7.15 from the reform-I era to the reform II era.
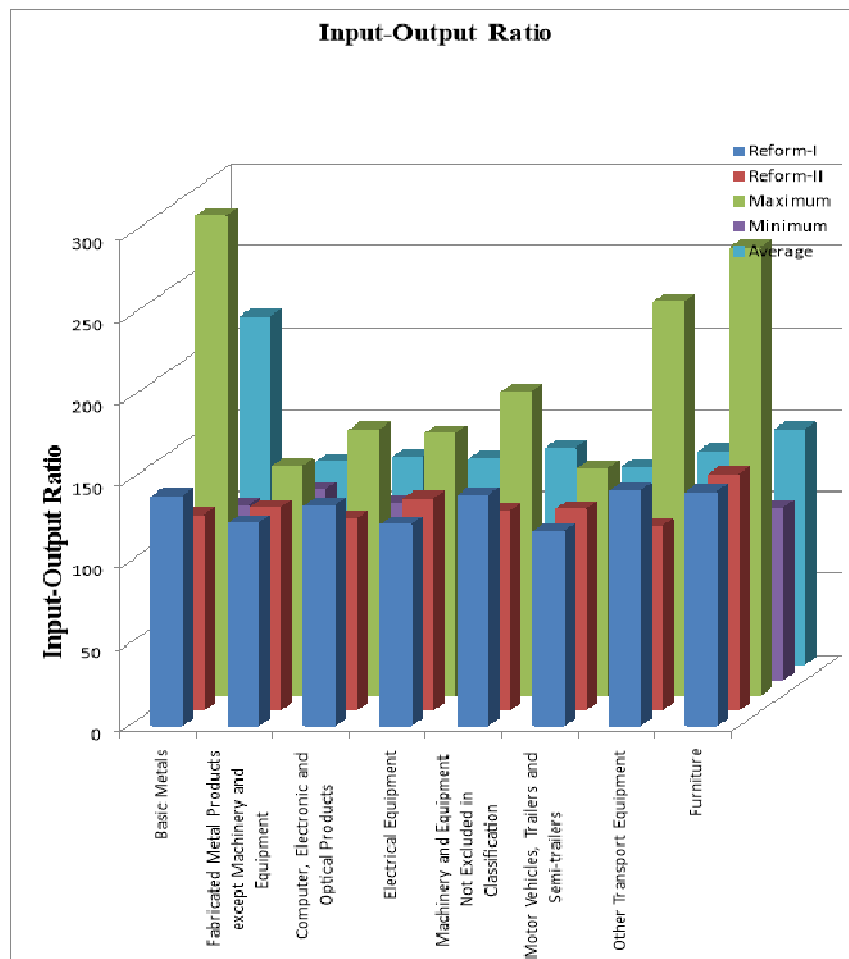
Figure 5.2.Input-Output Ratio in Light Engineering Industries

Employment Expressedin Light Engineering Industries

i. Total Number of Workers
ii. Total Persons Engaged

i. Total Number of Workers in Light Engineering Industries

The Table 5.3.i *(end of the paper)* and Figure 5.3.i indicates that the Total Number of Workers in light engineering industries of Basic Metal were maximum 32148 in 1994-1995, minimum were 9659 in 1998-1999, total average 22664, reform-I average 21499 and reform-II average 24146, Fabricated Metal Products except Machinery and Equipment were maximum 29355 in 2015-2016, lowest 13967 in 1996-1997 total average 19230, reform-I average 15575 and reform-II average 23958, Computer Electronic and Optical Products were maximum 46380 in 1993-1994 lowest 10620 in 2003-2004, average total 20904, reform-I average 20952 and reform-II average 20842, Electrical Equipment were maximum 30224 in 2009-10 lowest 11908 in 2000-2001, total average was 21326, reform-I average 19077 and reform-II average 24189, Machinery and Equipment were highest 42466 in 1993-1994 lowest 10387 in 1999-2000, average total 22604, reform-I average 23497 and reform-II average 21466 Motor Vehicle Trailers and Semi-Trailers

were maximum 33164 in 2015-2016 lowest 10755 in 2006-2007 average total 21895, reform-I average 19247 and reform-II average 25265 Other Transport Equipment were maximum 17356 in 2008-2009 lowest 10312 in 2010-2011, average total was 13797, reform-I average 14023 and reform-II average 13509 and Furniture Industries were maximum 25101 in 2017-2018 lowest 10170 in 1998-1999 average total was 17098, reform-I average 13568 and reform-II average 21592.

The Total Number of Workers were 46380 in Computer Electronic and Optical Products maximum in 1993-1994, minimum 9659 in Basic Metal in 1998-1999, the average maximum was 22664 of Basic Metal however lowest were 13797 in Other Transport.
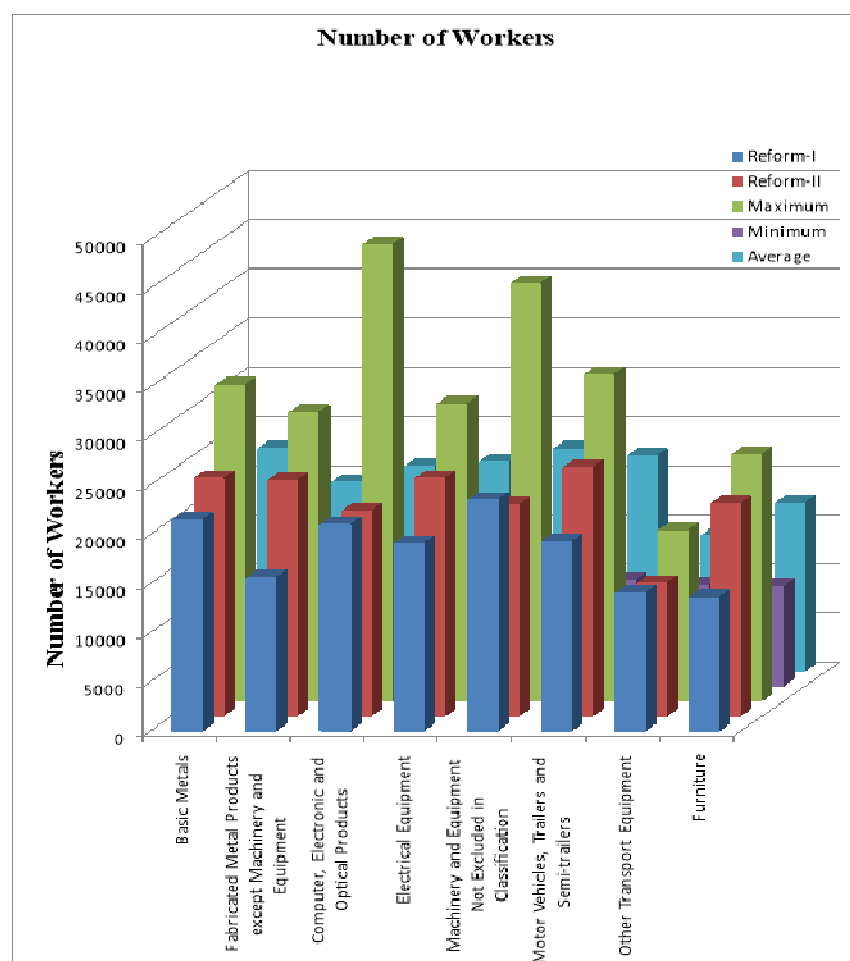
Figure 5.3.i.Number of Workers in Light Engineering Industries

The Total Number of Workers in the average of the reform-I era the Machinery and Equipment not excluded in classification was maximum 23497 however Furniture were minimum 13568 and average in reform-II era Motor Vehicles Trailers and Semi-trailers were maximum 2526 however Other Transport Equipment Total Number of Workers were minimum 13509. The Total Number of Workers growth trends % were in Basic Metals 12.31, Fabricated Metal Products Except 53.82, Computer Electronic and Optical Products -0.53, Electrical Equipment 26.80, Machinery

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and Equipment not excluded in classification -8.64, Motor Vehicles Trailers and Semi-trailers 31.27, Other Transport Equipment –3.67 and Furniture 59.14. The Total Number of Workers were 147438 in the reform-I era however in 174967 reform era –II.

Overall growth trend and tendencies in Total Number of Workers were positive in Basic Metals 12.31, Fabricated Metal Products Except 53.82, Electrical Equipment 26.80, Motor Vehicles Trailers and Semi-trailers 31.27 and Furniture 59.14 however adverse in Computer Electronic and Optical Products -0.53, Machinery and Equipment not excluded in classification -8.64, Other Transport Equipment –3.67. Total Number of Workers showed positive growth % of 18.67 from the reform-I era to the reform II era.

ii. Total Persons Engaged in Light Engineering Industries

The Table 5.3.ii *(end of the paper)* and Figure 5.3.ii indicates that the Total Persons Engaged in Basic Metal were maximum 46503 in 1993-1994, minimum 13300 in 1998-1999, total average 30361, reform-I average 29348 and reform-II average 31650, Fabricated Metal Products except Machinery and Equipment were maximum 56366 in 2017-18, lowest 23421 in 1993-1994, total average 41094, reform-I average 31572 and reform-II average 53214, Computer Electronic and Optical Products were maximum 39515 in 2017-18 lowest 15980 in 2003-2004, average total 25652, reform-I average 22945 and reform-II average 29098, Electrical Equipment were maximum 39950 in 2009-10 lowest 16143 in 2000-01, total average was 27802, reform-I average 23861 and reform-II average 32818, Machinery and Equipment were highest 47270 in 2017-2018 lowest 20398 in 2005-2006, average total 30448, reform-I average 29386 and reform-II average 31799, Motor Vehicle Trailers and Semi-Trailers were maximum 46503 in 1993-1994 lowest 13518 in 2003-2004 average total 31771 reform-I average 30241 and reform-II average 33718 Other Transport Equipment were maximum 28612 in 1996-1997, lowest 12961 in 2000-2001, average total 21772, reform-I average 23887 and reform-II average 19080 and Furniture Industries were maximum 34322 in 1996-97 lowest 10224 in 20010-2011 average total 24450, reform-I average 20927 and reform-II average 23153.

The Total Persons Engaged maximum 56366 were in Fabricated Metal Products except Machinery and Equipment 2017-2018 the minimum 10224 in Furniture in 2010-11, the average maximum was 41094 of Fabricated Metal Products except Machinery and Equipment lowest were 21772 in Other Transport Equipment. The Total Persons Engaged in an average of the reform-I era of Fabricated Metal Products except Machinery was maximum 31572 however Computer Electronic and Optical Products were minimum 22945 and average in reform-II of Fabricated Metal Products except Machinery and Equipment were maximum 53214 Other Transport Equipment Total Persons Engaged were minimum 19080. The Total Persons Engaged growth trends % were in Basic Metals 7.84, Fabricated Metal Products Except 68.54, Computer Electronic and Optical Products 26.82, Electrical Equipment 37.54, Machinery and Equipment not excluded in classification 8.21, Motor Vehicles Trailers and Semi-trailers 11.50, Other

Transport Equipment -20.12 and Furniture -21.70. The Total Persons Engaged were 220808 in the reform-I era however in 254530 reform era –II.

Overall growth trend and tendencies in Total Persons Engaged were positive in Basic Metals 7.84, Fabricated Metal Products Except 68.54, Computer Electronic and Optical Products 26.82, Electrical Equipment 37.54, Machinery and Equipment not excluded in classification 8.21, Motor Vehicles Trailers and Semi-trailers 11.50 nevertheless adverse in Other Transport Equipment -20.12 and Furniture -21.70. The Total Persons Engaged in light engineering industries showed positive growth of 15.27% from the reform-I era to the reform II era.
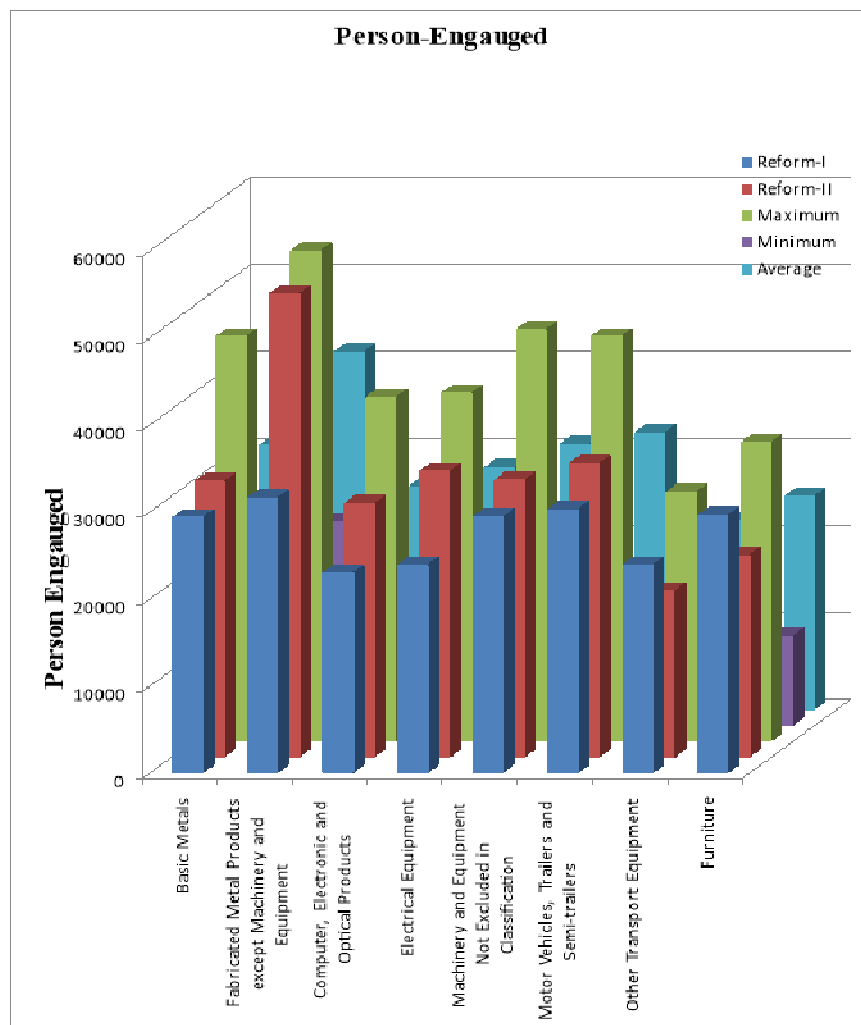

Figure 5.3.ii Person Engaged in Light Engineering Industries

Conclusions

The performance appraisal conclusions countenance conceal a basic benchmark for the small scale manufacturing industry of UP also for other states, populations, individuals and industries in the entire era of our studies are as follows:

1. The growth performance Reform-I era to the Reform-II era was positive in the total number of factories at 9.50%, employment expressed in a total number of workers at 18.67% and total persons engaged 15.27% nevertheless overall input-output ratio was negative -7.15%.

2. The number of factories performance was as positive in Fabricated Metal Products Except Machinery and Equipment, Electrical Equipment, Machinery and Equipment not excluded in classification, Other Transport Equipment and Furniture conversely negative in Basic Metals, Computer Electronic and Optical Products, Motor Vehicles Trailers and Semi-trailers.

3. An Input-Output Ratio growth performance trends were positive in Fabricated Metal Products Except Machinery and Equipment, Electrical Equipment, Motor Vehicles Trailers and Semi-trailers, and Furniture conversely negative in Basic Metals, Computer Electronic and Optical Products, Machinery and Equipment not excluded in classification and Other Transport Equipments.

4. An employment growth performance trends expressed in a total number of workers were positive in Basic Metals, Fabricated Metal Products Except Machinery and Equipment, Electrical Equipment, Motor Vehicles Trailers and Semi-trailers, and Furniture conversely negative in Computer Electronic and Optical Products, Machinery and Equipment not excluded in classification and Other Transport Equipment, and total persons engaged were positive in Basic Metals, Fabricated Metal Products Except Machinery and Equipment, Computer Electronic and Optical Products, Electrical Equipment, Machinery and Equipment not excluded in classification, Motor Vehicles Trailers and Semi-trailers conversely negative in Other Transport Equipment and Furniture.

5. This performance appraisal senses are not clear for instance industries indicators inclusive initiative and variables thereafter depth monitoring, governance, administration, specific norms, standards and guidelines must be established and implemented.

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Table 5.1.Number of Factories in Light Engineering Industries

S.N.	Year	Basic Metals	Fabricated Metal Products except Machinery and Equipment	Computer, Electronic and Optical Products	Electrical Equipment	Machinery and Equipment Not Excluded in Classification	Motor Vehicles, Trailers and Semi-trailers	Other Transport Equipment	Furniture
1.	1993-94	729	314	579	230	282	310	138	169
2.	1994-95	722	344	573	244	299	309	141	172
3.	1995-96	715	373	567	258	316	308	144	175
4.	1996-97	276	273	431	235	215	285	165	186
5.	1997-98	701	431	554	286	350	306	151	180
6.	1998-99	765	960	803	738	756	425	168	179
7.	1999-00	861	802	841	451	469	258	179	170
8.	2000-01	817	807	690	368	156	578	171	231
9.	2001-02	808	527	580	457	705	500	217	266
10.	2002-03	749	477	565	457	650	572	215	217
11.	2003-04	657	606	516	370	452	301	171	195
12.	2004-05	703	480	551	456	676	579	212	239
13.	2005-06	643	665	503	398	486	299	177	201
14.	2006-07	727	584	631	505	797	647	210	236
15.	Reform-I	705	546	599	389	472	406	176	201
16.	2007-08	522	862	654	512	355	117	187	234
17.	2008-09	457	870	457	454	589	132	182	284
18.	2009-10	569	913	442	470	503	186	196	281
19.	2010-11	607	811	472	468	571	294	194	214

20.	2011-12	600	840	466	482	588	294	197	216
21.	2012-13	593	869	459	496	605	293	200	219
22.	2013-14	586	898	453	510	622	292	203	221
23.	2014-15	578	927	447	524	639	291	207	224
24.	2015-16	571	956	440	538	656	290	210	227
25.	2016-17	624	1359	494	614	752	265	253	260
26.	2017-18	632	1195	438	610	846	257	278	229
27.	Reform-II	576	955	475	516	611	246	210	237
28.	Maximum	861	1359	841	738	846	647	278	284
29.	Minimum	276	273	431	230	156	117	138	169
30.	Average	649	726	544	445	533	336	191	217

Table 5.2.Input-Output Ratio in Light Engineering Industries

S.N.	Year	Basic Metals	Fabricated Metal Products except Machinery and Equipment	Computer, Electronic and Optical Products	Electrical Equipment	Machinery and Equipment Not Excluded in Classification	Motor Vehicles, Trailers and Semi-trailers	Other Transport Equipment	Furniture
31.	1993-94	132.68	128.02	131.07	101.59	126.41	116.51	118.25	137.87
32.	1994-95	123.12	139.70	132.94	118.14	185.35	130.43	141.37	133.33
33.	1995-96	125.63	129.42	131.95	120.02	165.36	133.45	130.40	135.89
34.	1996-97	126.10	119.00	130.67	135.52	154.64	138.15	128.25	139.27
35.	1997-98	292.93	117.82	141.43	123.60	152.11	136.53	127.24	131.19
36.	1998-99	131.81	116.47	154.81	115.16	148.28	132.63	125.05	111.88
37.	1999-00	164.29	118.15	132.60	110.07	129.03	124.52	130.73	139.46

38.	2000-01	117.23	130.08	144.29	125.52	119.43	077.76	240.50	129.70
39.	2001-02	129.35	121.46	132.87	129.60	123.63	087.30	148.19	135.85
40.	2002-03	136.73	120.90	124.33	126.33	179.72	114.45	160.75	140.73
41.	2003-04	126.78	133.57	133.64	099.56	142.42	130.98	157.86	144.41
42.	2004-05	125.64	115.76	161.99	119.74	114.60	120.95	143.71	153.44
43.	2005-06	126.00	119.16	120.91	138.11	124.34	116.66	132.93	159.65
44.	2006-07	106.27	124.22	107.95	159.93	103.93	100.71	123.61	207.12
45.	Reform-I	140.32	123.84	134.39	123.06	140.66	118.64	143.39	142.84
46.	2007-08	127.96	122.15	121.99	149.89	117.97	108.67	133.45	273.43
47.	2008-09	119.26	121.24	109.47	142.49	076.81	111.81	092.50	225.04
48.	2009-10	109.91	123.33	115.09	124.18	120.20	133.14	081.90	115.63
49.	2010-11	125.80	119.47	117.78	143.34	124.86	137.79	120.22	117.52
50.	2011-12	116.06	118.86	117.18	123.67	131.01	124.61	108.32	125.97
51.	2012-13	112.26	129.05	117.30	127.32	127.94	118.65	133.18	130.29
52.	2013-14	114.98	121.81	118.54	124.80	130.71	127.58	113.03	121.95
53.	2014-15	132.57	129.83	116.98	118.33	132.90	114.47	115.08	112.32
54.	2015-16	124.60	129.61	121.36	128.54	132.21	125.18	115.63	135.67
55.	2016-17	117.39	121.34	118.05	119.84	110.33	127.50	114.80	104.79
56.	2017-18	111.99	125.00	115.45	120.62	131.28	120.84	111.18	124.92
57.	Reform-II	119.34	123.79	117.20	129.36	121.47	122.75	112.66	144.32
58.	Maximum	292.93	139.70	161.99	159.93	185.35	138.15	240.50	273.43
59.	Minimum	106.27	115.76	107.95	099.56	076.81	077.76	081.90	104.79
60.	Average	212.53	123.82	126.82	125.84	132.22	120.45	129.92	143.49

Table 5.3.i.Number of Workers in Light Engineering Industries

S.N.	Year	Basic Metals	Fabricated Metal Products except Machinery and Equipment	Computer, Electronic and Optical Products	Electrical Equipment	Machinery and Equipment Not Excluded in Classification	Motor Vehicles, Trailers and Semi-trailers	Other Transport Equipment	Furniture
1.	1993-94	31109	14732	46380	29871	42466	31109	14595	19730
2.	1994-95	32148	17682	39644	26696	40236	29303	15729	21510
3.	1995-96	23188	15825	27630	22290	27462	30891	15359	16243
4.	1996-97	14227	13967	15615	17883	14688	32479	14989	10975
5.	1997-98	21705	14449	15128	16678	14558	21634	15445	10573
6.	1998-99	9659	14930	14641	15472	14427	10788	15900	10170
7.	1999-00	12642	14745	18832	14731	10387	15721	11787	11270
8.	2000-01	13281	14795	15233	11908	17312	21800	12901	10946
9.	2001-02	30965	15711	18854	19015	28573	12703	12810	12650
10.	2002-03	26714	15106	17121	17525	37605	13264	12835	12534
11.	2003-04	16209	15481	10620	18477	10630	12312	12742	10236
12.	2004-05	25447	15387	19987	20136	38495	13924	14186	13615
13.	2005-06	20591	16359	15611	18151	14638	12770	13625	14453
14.	2006-07	23104	18035	18035	18250	17485	10755	13422	15044
15.	Reform-I	21499	15575	20952	19077	23497	19247	14023	13568
16.	2007-08	25391	22962	18285	19490	17044	15552	16162	17819
17.	2008-09	20072	23439	21149	18444	20468	22473	17356	18976
18.	2009-10	15780	21970	21587	30224	17050	22904	11592	19700
19.	2010-11	23442	21933	21371	26186	18626	21147	10312	18327

20.	2011-12	24906	24339	21536	21771	19827	25544	12574	19408
21.	2012-13	24311	26566	16892	22914	20852	25363	16997	22080
22.	2013-14	24352	23407	17980	23113	19298	23078	13901	24080
23.	2014-15	22467	20723	18293	24295	20834	29098	15724	23354
24.	2015-16	27681	29355	19498	26550	23919	33164	10916	23999
25.	2016-17	25866	20633	24889	25675	25245	27409	10974	24665
26.	2017-18	31338	28211	27781	27417	32966	32183	12088	25101
27.	Reform-II	24146	23958	20842	24189	21466	25265	13509	21592
28.	Maximum	32148	29355	46380	30224	42466	33164	17356	25101
29.	Minimum	9659	13967	10620	11908	10387	10755	10312	10170
30.	Average	22664	19230	20904	21326	22604	21895	13797	17098

Table 5.3.ii.Person Engaged in Light Engineering Industries

S.N.	Year	Basic Metals	Fabricated Metal Products except Machinery and Equipment	Computer, Electronic and Optical Products	Electrical Equipment	Machinery and Equipment Not Excluded in Classification	Motor Vehicles, Trailers and Semi-trailers	Other Transport Equipment	Furniture
61.	1993-94	46503	23421	22930	24646	29347	46503	22078	33639
62.	1994-95	36072	23726	24694	22220	25959	45012	17476	33660
63.	1995-96	28833	24465	25103	21549	24151	45702	23044	33991
64.	1996-97	21593	25204	25512	20878	22342	46391	28612	34322
65.	1997-98	29926	26306	22224	24116	22128	40382	28424	33361
66.	1998-99	13300	27408	18936	27353	21913	34372	28235	32399
67.	1999-00	16698	28230	23295	21836	23570	27671	24130	30577

68.	2000-01	15822	28383	23191	16143	28471	30066	12961	13990
69.	2001-02	45893	26552	24183	24790	34050	19176	24407	18535
70.	2002-03	40604	28307	21791	23498	43856	21028	26064	18592
71.	2003-04	21072	28244	15980	24958	44987	13518	23896	13826
72.	2004-05	37258	46524	25552	27218	44635	20563	25898	19001
73.	2005-06	26881	52358	22147	26981	20398	18391	24825	19733
74.	2006-07	30416	52880	25688	27874	25596	14606	24367	20927
75.	Reform-I	29348	31572	22945	23861	29386	30241	23887	29568
76.	2007-08	33068	52454	26546	27020	24749	20443	24713	23693
77.	2008-09	26540	51090	27548	26648	29943	29599	19502	23143
78.	2009-10	22177	50594	28188	39950	24327	30505	15255	22735
79.	2010-11	30563	49079	29112	36714	27115	28952	13307	10224
80.	2011-12	33161	53521	29165	29747	31860	34850	19309	23482
81.	2012-13	32897	53558	22972	31071	31018	33169	21884	24178
82.	2013-14	31572	52635	25518	31116	29807	31473	21240	25580
83.	2014-15	29515	54035	26327	32505	31561	37950	22482	24343
84.	2015-16	36037	55909	29351	35242	34317	42946	17342	25303
85.	2016-17	33295	56113	35836	33988	37822	37654	16421	26503
86.	2017-18	39320	56366	39515	36993	47270	43360	18427	25501
87.	Reform-II	31650	53214	29098	32818	31799	33718	19080	23153
88.	Maximum	46503	56366	39515	39950	47270	46503	28612	34322
89.	Minimum	13300	23421	15980	16143	20398	13518	12961	10224
90.	Average	30361	41094	25652	27802	30448	31771	21772	24450