

Micro, Small and Medium Enterprises (MSMEs)



Exploratory Data Analysis and
Descriptive Statistics of Micro, Small
and Medium Enterprises (MSMEs)

By

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1. MSME

1.1 Introduction

The Micro Small and Medium Enterprises (MSMEs) sector has gained significant importance due to its contribution to Gross Domestic Product (GDP) of India. It contributes significantly to the economy and social development of Indian economy over the last five decades. Only next to agriculture, it has generated large number employment opportunities at lower capital cost, while, fostering new entrepreneur opportunity especially in semi- urban and rural areas. The MSMEs are widening their domain across sectors of the economy, producing diverse range of products and services to meet demands of domestic as well as global market.

1.2 Distribution of MSME

The **Ministry of Micro, Small and Medium Enterprises (MSME)** designs policies and implement them. It was formed by merging e Ministry of Small-Scale Industries and the Ministry of Agro and Rural Industries in 2007. The Act which gives the Ministry the authority to perform these tasks is **Micro, Small and Medium Enterprises Development (MSMED) Act, 2006**. Under the Act. According to the provisions of Act all MSME are classified in two classes i.e., **Manufacturing Enterprises and Service Enterprises**, which is further classified into Micro Small and Medium enterprises as following rules:

Criteria	Manufacturing		Service	
	Turnover	Investment	Turnover	Investment
Micro	Rs. 5 crore (US\$ 0.6 million)	Less than Rs. 25 lakh (US\$ 0.03 million)	Rs. 5 crore (US\$ 0.6 million)	Less than Rs. 10 lakh (US\$ 0.01 million)
Small	Rs. 50 crore (US\$ 6.8 million)	More than Rs. 25 lakh (US\$ 0.03 million) but less than Rs. 5 crore (US\$ 0.6 million)	Rs. 50 crore (US\$ 6.8 million)	More than Rs. 10 lakh (US\$ 0.01 million) but less than Rs. 2 crore (US\$ 0.3 million)
Medium	Rs. 250 crore (US\$ 34 million)	More than Rs. 5 crore (US\$ 0.6 million), but less than Rs. 10 crore (US\$ 1.4 million)	Rs. 250 crore (US\$ 34 million)	More than Rs. 2 crore (US\$ 0.3 million) but does not exceed Rs. 5 crore (US\$ 0.6 million)

2. DATA

Primary data are collected from **MSME 2020-2021 Annual report** publish by Ministry of MSME which uses reference data of **National Sample Survey 73rd Round & Central Statistics Office (CSO)**. Also, to understand the effect of Covid on MSME sector a detail analysis is done using **MSME Plus** report compiled by **CIBIL & SIDBI**.

2.1 MSME Annual Report (2020-2021)

2.1.1 Gross Value Added (GVA) of MSME in all India GDP

Year	Total MSME GVA (in Crore)	Growth (%)	Total GVA (in Crore)	Share of MSME in GVA (%)	All India GDP (in Crore)	Share of MSME in All India GDP (in %)
2014-15	₹ 36,58,196.00	12.27%	₹ 1,15,04,279.00	31.80%	₹ 1,24,67,959.00	29.34%
2015-16	₹ 40,59,660.00	10.97%	₹ 1,25,74,499.00	32.28%	₹ 1,37,71,874.00	29.48%
2016-17	₹ 45,02,129.00	10.90%	₹ 1,39,65,200.00	32.24%	₹ 1,53,91,669.00	29.25%
2017-18	₹ 50,86,493.00	12.98%	₹ 1,55,13,122.00	32.79%	₹ 1,70,98,304.00	29.75%
2018-19	₹ 57,41,765.00	12.88%	₹ 1,71,39,962.00	33.50%	₹ 1,89,71,237.00	30.27%

The data presents YoY contribution of MSME sector in Indian economy.

2.1.2 Distribution of Enterprises

As MSME is a great source of employment in India, it is important to know its distribution over places. Approximately 70% of Indian population lives in rural area, so does the distribution of MSME around Rural & Urban areas. Secondly, lets check State wise distribution to know growth and development measures results taken different State Government.

2.1.2.1 Rural and Urban area wise

Sector	Micro	Small	Medium	Total	Share (%)
Rural	32409000	78000	1000	32488000	51
Urban	30643000	253000	4000	30900000	49
All	63052000	331000	5000	63388000	100

2.1.2.2 State-wise Distribution of MSME

Sl. No.	State/UT	Micro	Small	Medium	MSME
1	Andhra Pradesh	3374000	13000	0	3387000
2	Arunachal Pradesh	22000	0	0	23000
3	Assam	1210000	4000	0	1214000
4	Bihar	3441000	4000	0	3446000
5	Chhattisgarh	845000	3000	0	848000
6	Delhi	925000	11000	0	936000
7	Goa	70000	0	0	70000
8	Gujarat	3267000	50000	0	3316000
9	Haryana	953000	17000	0	970000
10	Himachal Pradesh	386000	6000	0	392000
11	Jammu & Kashmir	706000	3000	0	709000
12	Jharkhand	1578000	10000	0	1588000
13	Karnataka	3825000	9000	0	3834000
14	Kerala	2358000	21000	0	2379000
15	Madhya Pradesh	2642000	31000	1000	2674000
16	Maharashtra	4760000	17000	0	4778000
17	Manipur	180000	0	0	180000
18	Meghalaya	112000	0	0	112000
19	Mizoram	35000	0	0	35000
20	Nagaland	91000	0	0	91000
21	Odisha	1980000	4000	0	1984000
22	Punjab	1456000	9000	0	1465000
23	Rajasthan	2666000	20000	1000	2687000
24	Sikkim	26000	0	0	26000
25	Tamil Nadu	4927000	21000	0	4948000
26	Telangana	2594000	10000	1000	2605000
27	Tripura	210000	1000	0	211000
28	Uttar Pradesh	8964000	36000	0	8999000
29	Uttarakhand	414000	2000	0	417000
30	West Bengal	8841000	26000	1000	8867000
31	A & N Islands	19000	0	0	19000
32	Chandigarh	56000	0	0	56000
33	Dadra & Nagar Haveli	15000	1000	0	16000
34	Daman & Diu	8000	0	0	8000
35	Lakshadweep	2000	0	0	2000
36	Puducherry	96000	0	0	96000
ALL	Total	63052000	331000	5000	63388000

2.1.3 Employment provided by MSME

MSME is 2nd most employment generating sector after agriculture & at low capital cost, which is essential for Indian economy growth and fulfil the scarcity of job faced by youths. It provides employments in both Rural and Urban area and insure gender equality.

2.1.3.1 Distribution of employment by type of Enterprises in Rural and Urban Areas

Sector	Micro	Small	Medium	Total	Share (%)
Rural	48930000	788000	60000	49778000	45
Urban	58688000	2406000	116000	61210000	55
All	107619000	3195000	175000	110989000	100

2.1.3.2 Distribution of workers by gender

Sector	Female	Male	Total	Share (%)
Rural	137.5	360.15	497.78	45
Urban	127.42	484.54	612.1	55
Total	264.92	844.68	1109.89	100
Share (%)	24	76	100	

2.1.3.3 Distribution of workers State wise

Sl. No.	State/UT	Female	Male	Total
1	Andhra Pradesh	21.01	34.98	55.99
2	Arunachal Pradesh	0.11	0.29	0.41
3	Assam	1.78	16.37	18.15
4	Bihar	4.79	48.26	53.07
5	Chhattisgarh	4.07	12.79	16.86
6	Delhi	2.41	20.59	23
7	Goa	0.41	1.2	1.6
8	Gujarat	13.71	47.44	61.16
9	Haryana	2.78	16.27	19.06
10	Himachal Pradesh	1.13	5.29	6.43
11	Jammu & Kashmir	1.5	9.37	10.88
12	Jharkhand	5.57	19.34	24.91
13	Karnataka	19.73	51.11	70.84
14	Kerala	13.77	30.86	44.64
15	Madhya Pradesh	10.13	38.61	48.8
16	Maharashtra	17.97	72.77	90.77

17	Manipur	1.4	1.52	2.92
18	Meghalaya	0.72	1.19	1.91
19	Mizoram	0.28	0.34	0.62
20	Nagaland	0.59	1.18	1.77
21	Odisha	8.37	24.87	33.26
22	Punjab	4.24	20.55	24.8
23	Rajasthan	8.01	38.31	46.33
24	Sikkim	0.14	0.31	0.45
25	Tamil Nadu	32.27	64.45	96.73
26	Telangana	15.24	24.91	40.16
27	Tripura	0.44	2.51	2.95
28	Uttar Pradesh	27.27	137.92	165.26
29	Uttarakhand	0.69	5.91	6.6
30	West Bengal	43.51	91.95	135.52
31	A & N Islands	0.1	0.29	0.39
32	Chandigarh	0.12	1.17	1.29
33	Dadra & Nagar Haveli	0.07	0.29	0.36
34	Daman & Diu	0.02	0.12	0.14
35	Lakshadweep	0.01	0.02	0.03
36	Puducherry	0.57	1.27	1.84
ALL	Total	264.92	844.68	1109.89

2.2 MSME Plus

To understand the effects of Pandemic on MSME sector let's probe the credit disbursement amount in MSME sector quarterly from 2019 to 2021, pre pandemic to post pandemic.

Quarters	Micro (in Crore)	Small (in Crore)	Medium (in Crore)	Total (in Crore)
Apr.'19-June.'19	35000	57000	55000	145000
Juty '19-Sept.'19	42000	65000	61000	169000
Oct. '19-Dec.'19	42000	68000	62000	172000
Jan. '20-March. '20	44000	74000	73000	191000
Aprii '20-June '20	43000	83000	69000	195000
July '20-Sept. '20	58000	109000	100000	267000
Oct. '20-Dec. '20	52000	97000	92000	241000
Jan. '21-March '21	52000	97000	95000	245000

3. ANALYSIS

We perform an EDA to be cognizant of collected Data so that we can understand its behavioral conduct and provide better judgment. After performing the EDA, we visualize the data, which make it explanatory by itself and help us to achieve certain insights and statistical measures.

3.1 EDA of MSME Gross Value Addition

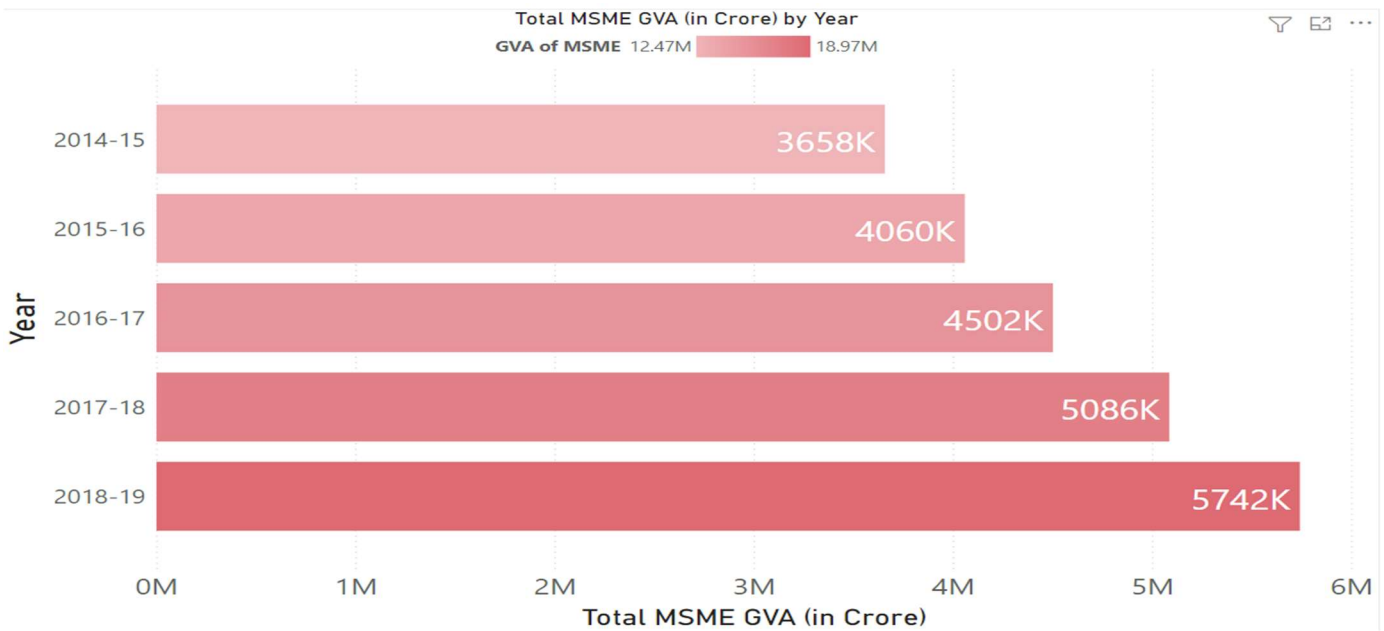
At first, we must understand the central tendency of the provided data and look into other factors for descriptive analysis.

	Total SME GVA (in Crore)	Growth (%)	Total GVA (in Crore)	Share of MSME in GVA (%)	All India GDP (in Crore)	Share of MSME in All India GDP (in %)
count	5.000000	5.000000	5.000000	5.000000	5.000000	5.000000
mean	4609649	0.120000	1413941	0.325220	1554021	0.296180
std	8258901	0.010098	2253531	0.006496	2587828	0.004106
min	3658196	0.109000	1150428	0.318000	1246796	0.292500
25%	4059660	0.109700	1257450	0.322400	1377187	0.293400
50%	4502129	0.122700	1396520	0.322800	1539167	0.294800
75%	5086493	0.128800	1551312	0.327900	1709830	0.297500
max	5741765	0.129800	1713996	0.335000	1897124	0.302700

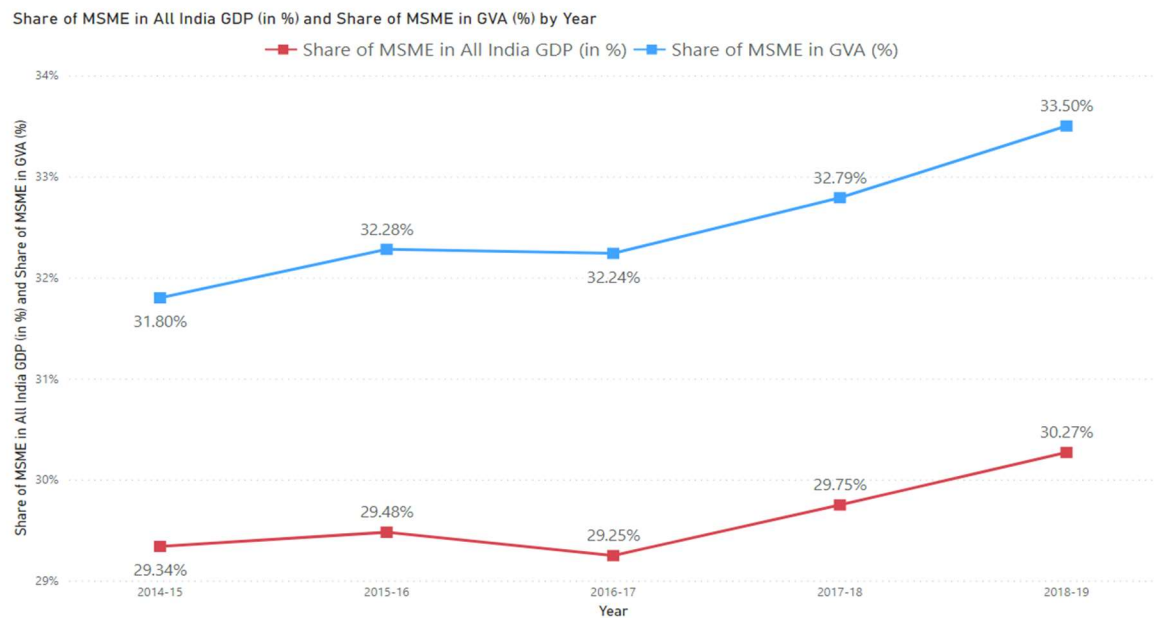
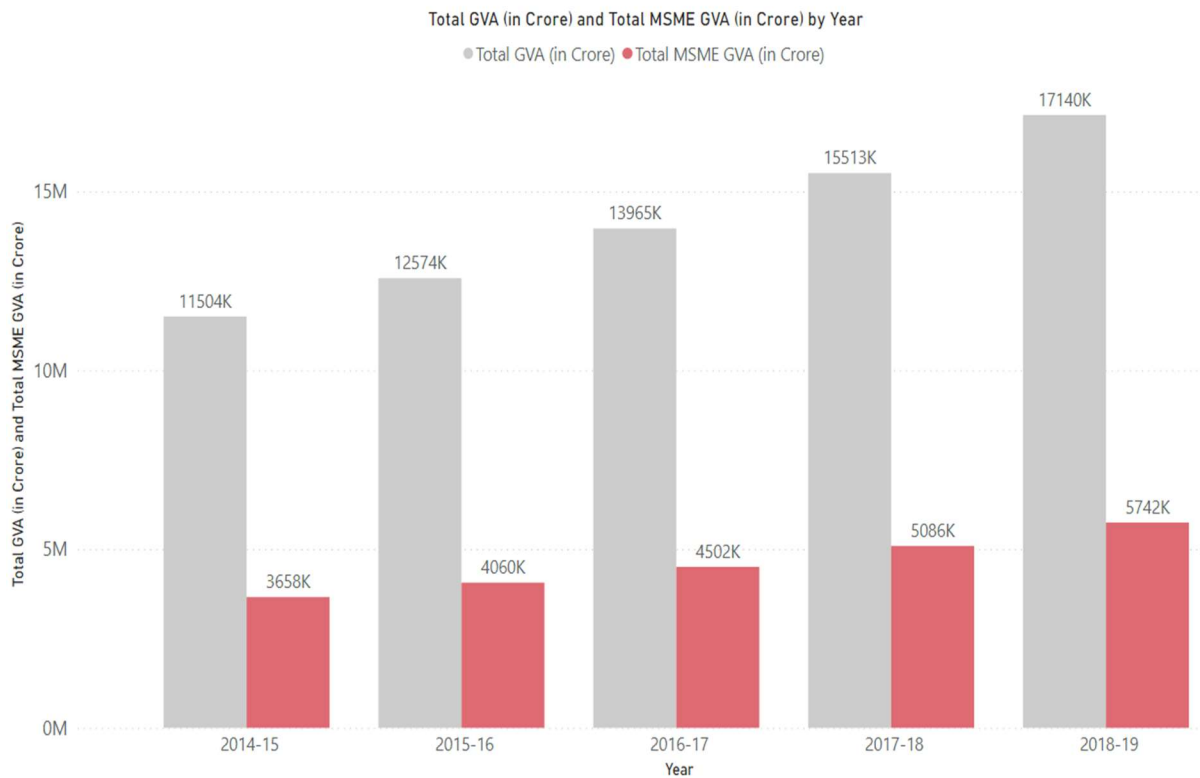
Since, all the data are in Numeric format we can performed some number crunching and got:

- ❖ The Minimum and maximum of GVA added by MSME, GVA every Year and GDP.
- ❖ But the most important thing we understood is mean growth of MSME YoY, mean share of MSME in Total GVA and GDP of India,
- ❖ Also, we can look for Standard deviation to see the variance in the data

After this we perform Visualization to get better insights of data.



The Bar chart shows the gradual increase of contribution of MSME in the Indian economy and by how much.



Let's see the MSME GVA contribution in Total GVA of India YoY.

- ❖ We can conclude from the Bar chart that MSME GVA almost cover one-third of Total GVA of India.
- ❖ The Line chart is helpful in giving the exact measures of MSME contribution in GVA and GDP YoY.

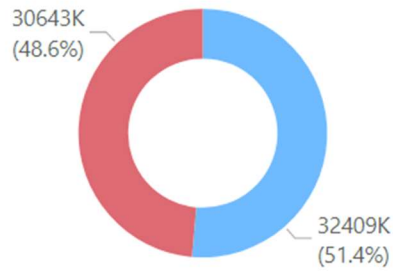
3.2 Enterprise Distribution Analysis

3.2.1 Location wise

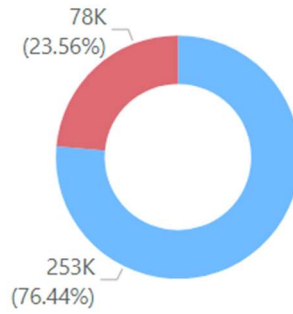
	Micro	Small	Medium	Total	Share (%)
count	2	2	2	2	2
mean	31526000	165500	2500	31694000	50
std	1248751	123744	2121	1122886	1
min	30643000	78000	1000	30900000	49
25%	31084500	121750	1750	31297000	50
50%	31526000	165500	2500	31694000	50
75%	31967500	209250	3250	32091000	50
max	32409000	253000	4000	32488000	51

We can clearly see that India have huge number of Micro Enterprises compare to Small and Medium Enterprises.

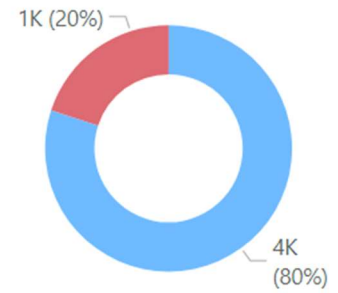
Micro by Sector



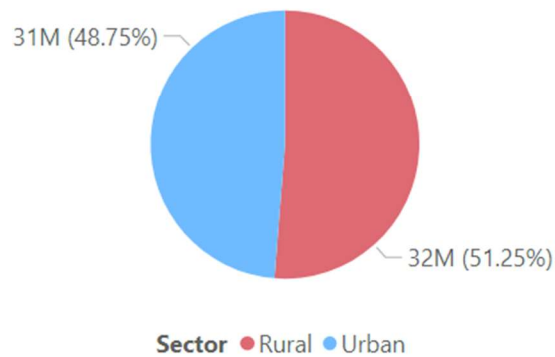
Small by Sector



Medium by Sector



Total by Sector



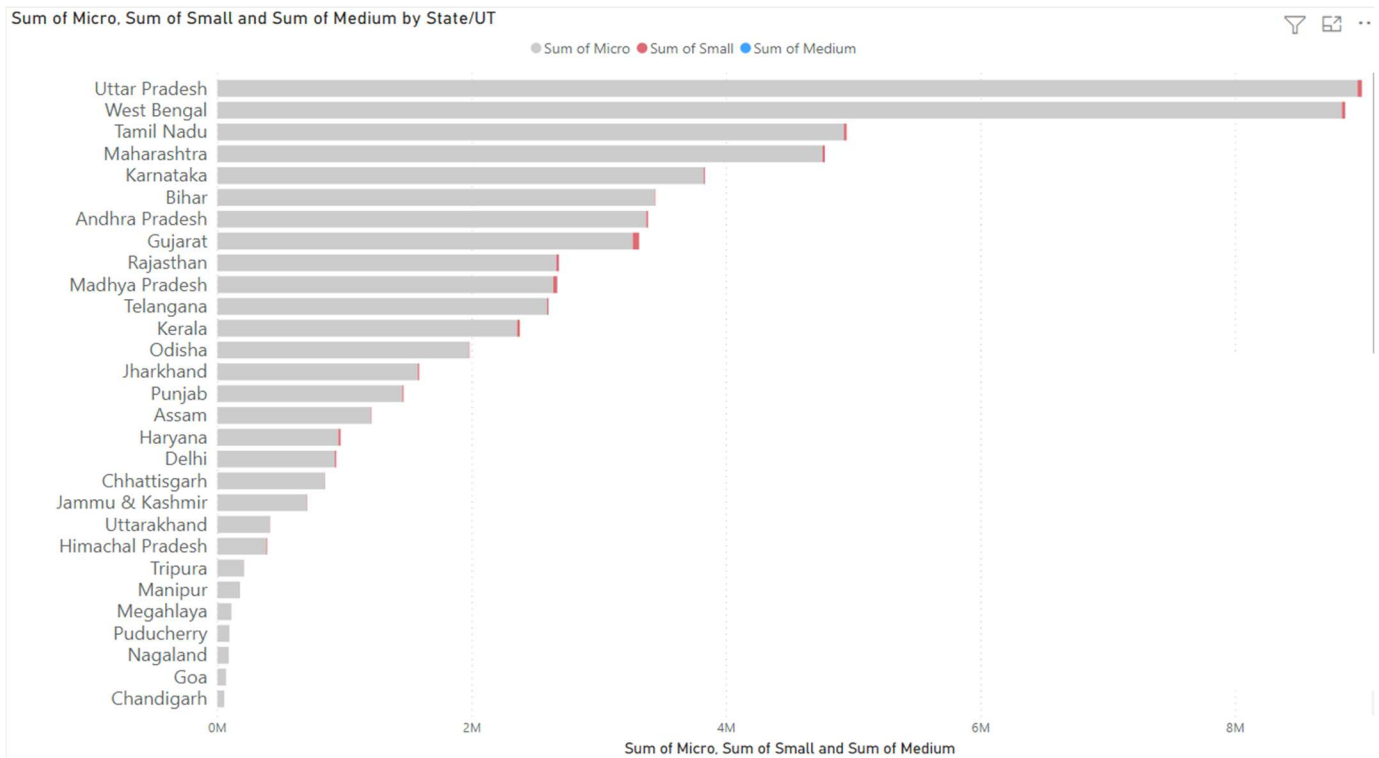
A clear distribution of can be understand by Pie chart

- ❖ Equal distribution Of Micro Enterprises in both Rural and Urban area
- ❖ All most 24% of Small Enterprises is in Rural area
- ❖ Whereas only 20% of Medium Enterprises are in Rural areas
- ❖ Overall, both the Rural and Urban areas have Equal Enterprises distributed between them

3.2.2 State-wise

	Micro	Small	Medium	MSME
count	36	36	36	36
mean	18	1751500	9139	111
std	11	2288632	12008	319
min	1	2000	0	0
25%	10	85750	0	0
50%	18	885000	4000	0
75%	27	2648000	14000	0
max	36	8964000	50000	1000

The Enterprises wise distribution over the States, with the maximum and minimum number of Enterprises at a States and their overall distribution is provide by the data above.



From the bar chat representation of data, we can easily Drive that:

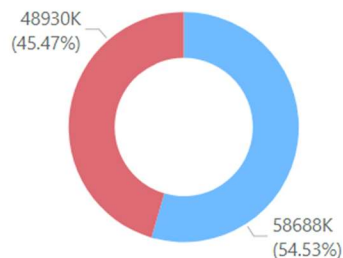
- ❖ Uttar Pradesh have Maximum number of MSME just followed by West Bengal
- ❖ Mostly, States have Micro Enterprises and Gujarat Having Maximum Small Enterprises
- ❖ Top 15 States have almost 75% of MSME in India

3.3 Employment EDA

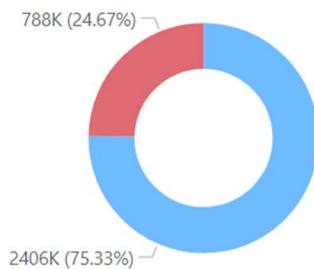
3.3.1 Enterprise wise

	Micro	Small	Medium	Total	Share (%)
count	2	2	2	2	2
mean	53809000	1597000	88000	55494000	50
std	6899948	1144099	39598	8083645	7
min	48930000	788000	60000	49778000	45
25%	51369500	1192500	74000	52636000	48
50%	53809000	1597000	88000	55494000	50
75%	56248500	2001500	102000	58352000	52
max	58688000	2406000	116000	61210000	55

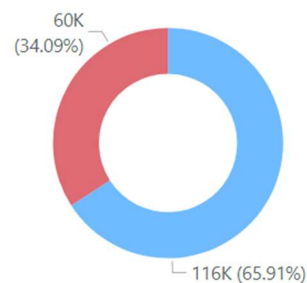
Micro by Sector



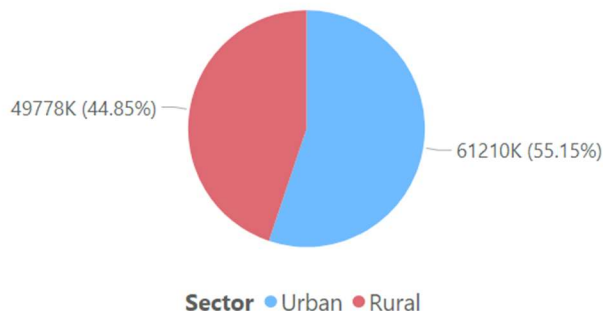
Small by Sector



Medium by Sector



Total by Sector

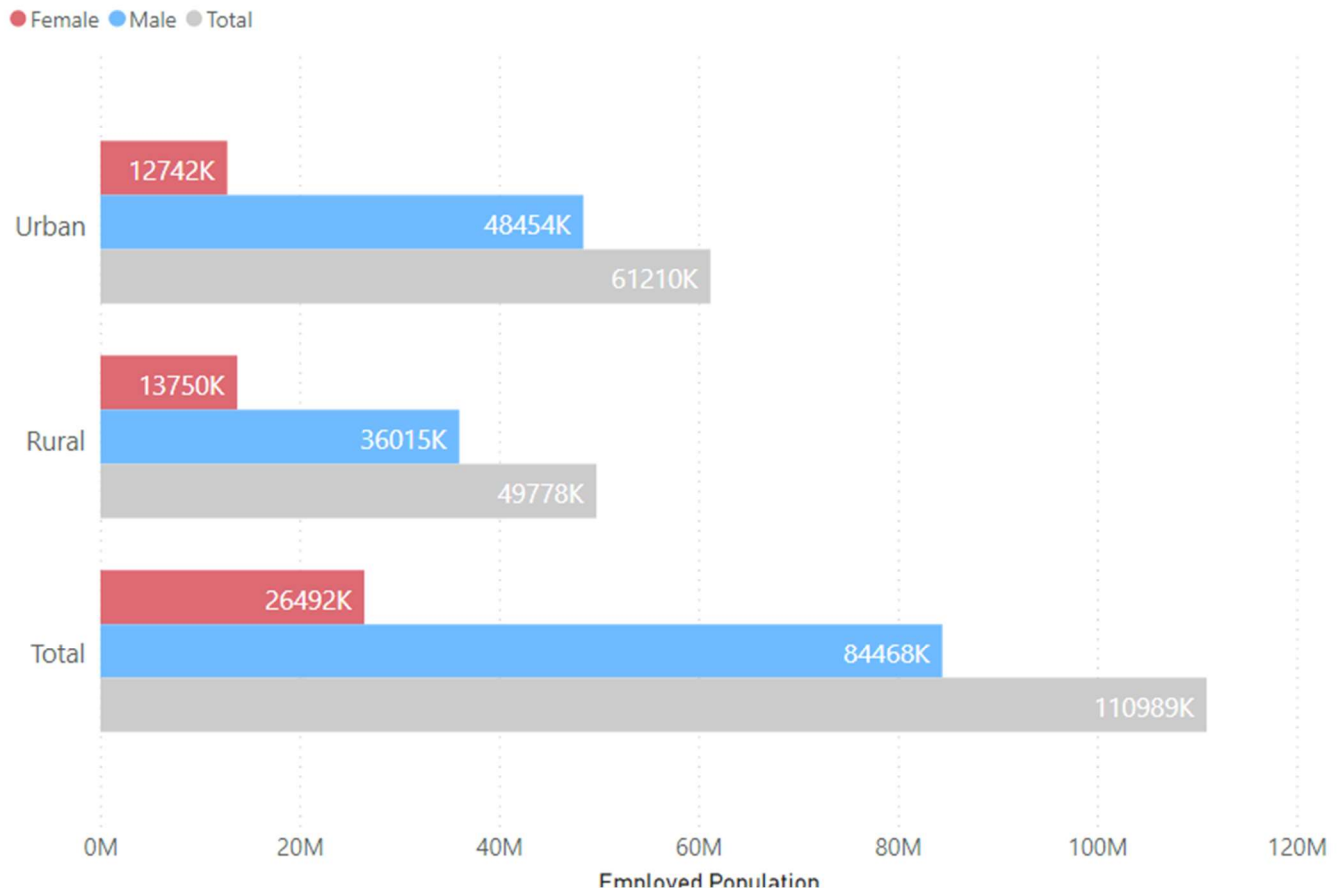


It could be understood by the pie charts that:

- ❖ Micro sector provided employment to 10761.9 lakh people that accounts for around 97% of total employment in the sector. It is one of the major enterprises that provide employment in rural area compared to Small and Medium Enterprises.
- ❖ Small Sector provided employment to 319.5 lakh (2.88%) and of which a third in Urban areas.
- ❖ Medium Sector provided employment to 17.5 lakh (0.16%).
- ❖ Overall MSME Sector provided 11098.8 lakh jobs, out of which 4977.8 lakh in Rural area and 6121 lakhs in Urban area.

3.3.2 Gender wise

Female, Male and Total by Sector

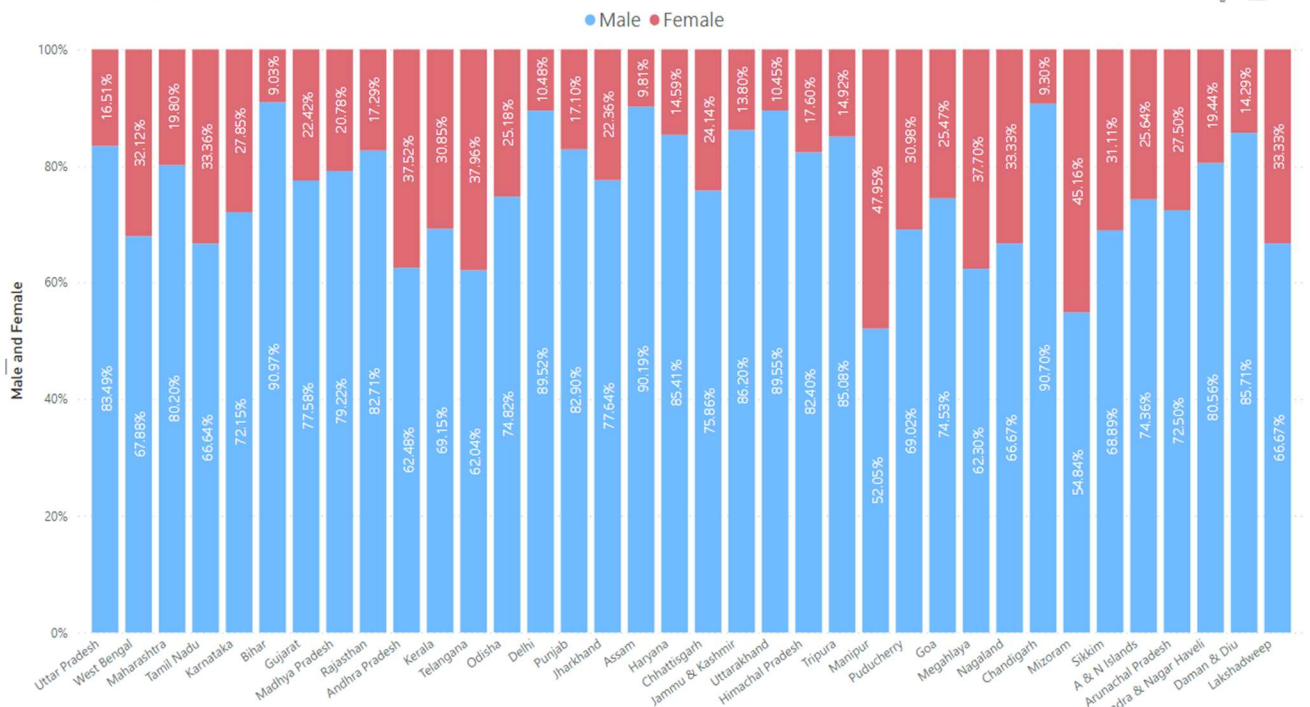
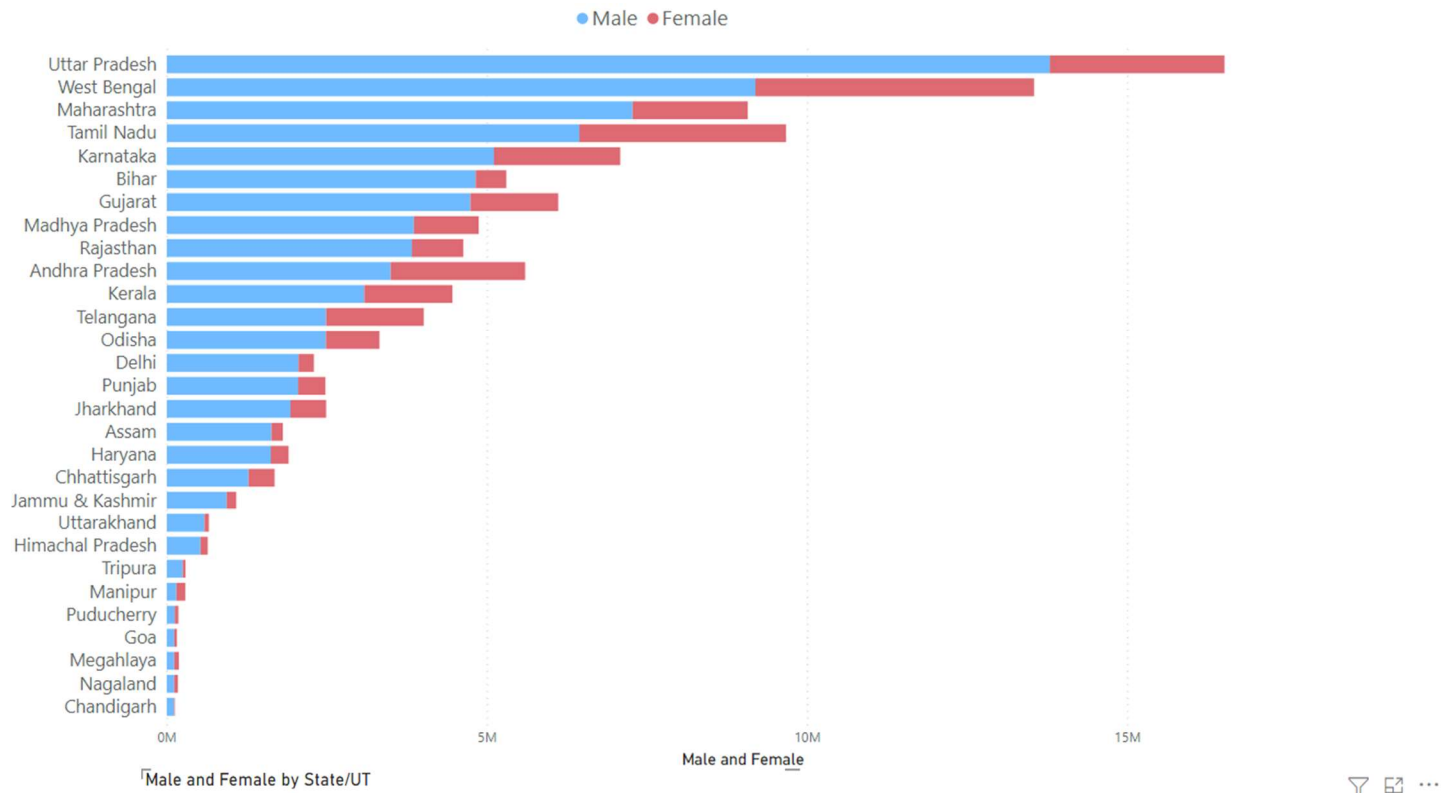


The bar chart is a good way of looking at the sectoral distribution of workers in male and female categories, Urban and Rural wise, as well as from an overall viewpoint.

- ❖ In Urban areas, around 20% of jobs in MSME are done by women.
- ❖ Whereas in Rural areas, this ratio is better and around more than 25% of jobs are done by women.
- ❖ Out of 1109.89 lakh employees in the MSME sector, 844.68 (76%) are male employees and the remaining 264.92 lakh (24%) are females.

3.3.3 State-wise

	Female	Male	Total
count	36	36	36
mean	735917	2346167	3083056
std	1047666	3059345	3999318
min	1000	2000	3000
25%	43250	118750	172750
50%	209500	1453000	1750500
75%	1102500	3581250	4694750
max	4351000	13792000	16526000



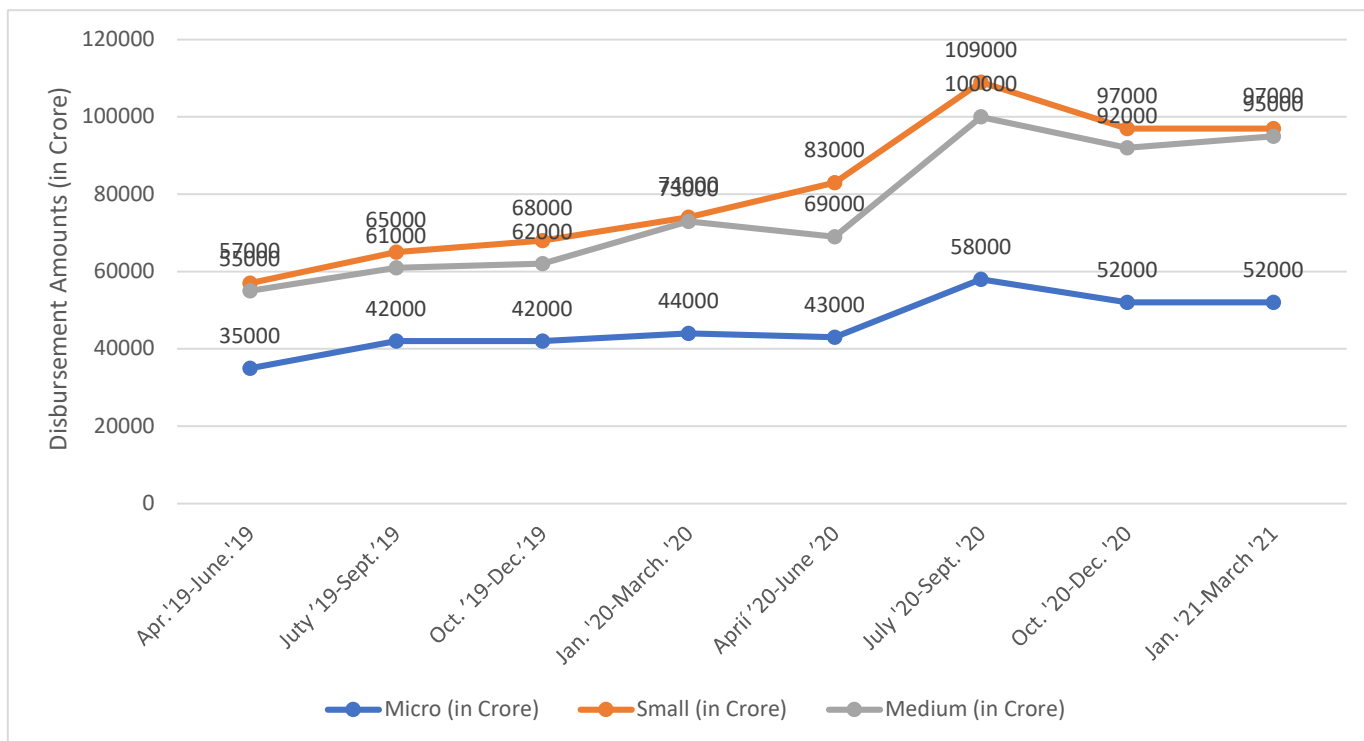
These distribution show that:

- ❖ Uttar Pradesh had the largest number of estimated MSMEs with a share of 14.20% of MSMEs in the country.
- ❖ Top 10 States accounted for a share of 74.05% of the total estimated number of MSMEs in the country
- ❖ Manipur has done best in terms of Gender equality (47.95%), whereas West Bengal has given most employment to women.

3.4 Credit Influx Analysis 2019-2021

	Micro (in Crore)	Small (in Crore)	Medium (in Crore)	Total (in Crore)
count	8	8	8	8
mean	46000	81250	75875	203125
std	7387	18321	17374	43083
min	35000	57000	55000	145000
25%	42000	67250	61750	171250
50%	43500	78500	71000	193000
75%	52000	97000	92750	242000
max	58000	109000	100000	267000

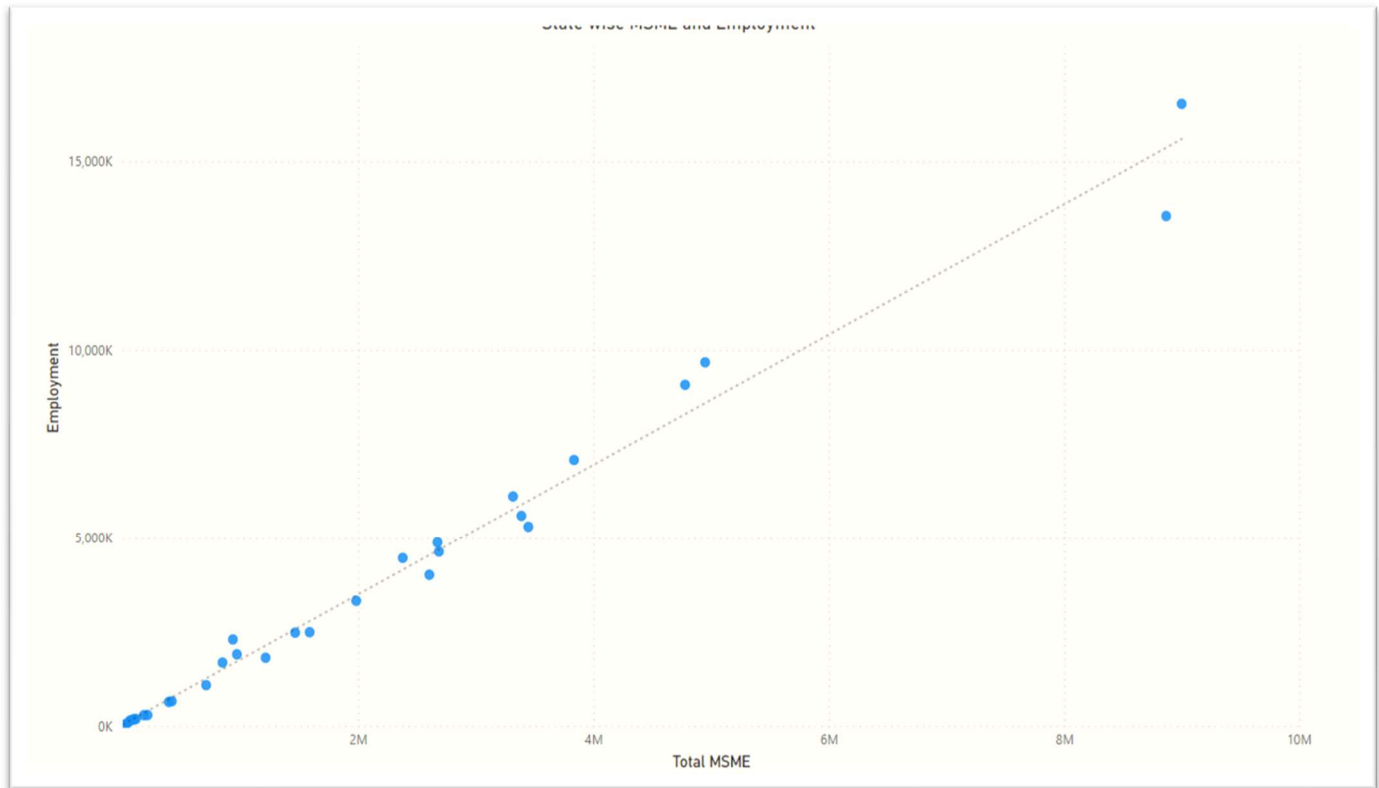
- ❖ From the mean we can understand that Micro is increasing at rate of 46000 Crore, Small is increasing at rate of 81250 Crore and Medium is increasing at rate of 75875 Crore with Standard deviation of respectively.
- ❖ In combine MSME seen growth of 43083 Crore at Standard deviation 203125 Crore.
- ❖ Maximum lending is seen in Small Enterprises and minimum in Micro Enterprises



Form the Line chart we can conclude:

- ❖ We can see quarter on quarter increase in distribution of money in all MSME sectors till March,2020.
- ❖ After Covid-19 struck, we can see decline in distribution in Micro and Medium sectors but for Small it remains constant.
- ❖ There is quite a growth can be seen till October,2020 after which raise of cases and strict lockdown restricted the growth.
- ❖ But even after second wave MSME recover and seen more robust growth.

3.5 State wise Employment and MSME Bivariant Analysis



4. Conclusion

Till 2019 we can see that MSME is one of the major contributors in GDP of India. This industry is equally divided among Rural and Urban areas, but the count of Micro industries is high comparative to Small and Medium Industries, which are more prominent in Urban areas. If we look into States wise distribution of MSME, just 10 top States have almost 75% of total MSME.

By the prospective of Employment generation scenario of MSME, we can derive that Micro Industries are driving force for the job creation (97% of Jobs generated). But the most interesting thing is the women employee in this sector, they contribute one -fourth of employment in sector and the large number of their population is drive by Rural women which is very good as far as socio economic prospective of India is in concern. The East and North-East India is doing well in terms of Gender equality (Disclaimer is these places are known for their Tea cultivation).

During the period of pandemic, the distribution of credit in this sector gets hit which can seen by the total credit loss in quarter of April,2020- June,2020, but not for Small Industries (Probably because it related to Medical production industries). But after that the credit distribution take a U-turn and the credit distribution cross even pre Covid-19 level. Although in next quarter we have seen quite a decline because of rising cases and strict lockdown. A very good reason for such a sharp jump is the Atmanirbhar Bharat plan devised by Indian government which give 100% credit guarantee to lenders.