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INVESTMENT AND TURNOVER TRENDS IN MSMEs: INSIGHTS FROM A COMPARISON OF SOME LEADING STATES OF INDIA

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ABSTRACT DOI No: 10.36713/epra26176 Article DOI: https://doi.org/10.36713/epra26176

Purpose: *This study seeks to determine statistically significant differences in MSME distribution across major states of India, analyzing variance in investment patterns, evaluating heterogeneity in turnover categories and assessing employment generation patterns.*
Design/methodology/approach: *The study employs mixed-methods approach, combining both quantitative and qualitative data and analyses methods. This study draws on a range of empirical studies and reports of ministries, policy framework, economic survey and budgetary analysis to provide a comprehensive understanding of financials of MSMEs. Descriptive and analytical statistical measures are used in conjunction to provide a comprehensive analysis of the data, revealing its key characteristics, patterns and relationships.*
Findings: *The study reveals that MSMEs have shown significant growth in investment and turnover in recent years and the sector is significantly contributing towards empowering semi-urban and rural areas, increasing employment opportunities and augmenting the overall economic viability of the nation. Insights from comparative analysis of leading states highlights the areas for which robust strategies may be formulated to further enhance MSME ecosystem, ensuring its continued contribution to regional and national economic development.*
Research limitations/implications: *The primary limitations included reliance on secondary data sources, time period constraint (2020-2022), resource constraints and registration-based data limitations. The geographical scope of the study is limited, covering only a few prominent states, which may restrict the applicability of the findings to other parts of the country. External influences that could impact the MSME landscape have not been thoroughly examined.*
Originality/value: *Through a comparative analysis of MSME investment and turnover trends across major Indian states, this study delineates the major focus areas, enabling the development of targeted regional strategies to foster MSMEs growth.*

KEYWORDS: *MSMEs, Investment, Turnover, Growth, Economic development, Employment*

INTRODUCTION

Micro, Small and Medium Enterprises play a crucial role in the economic development of India, contributing significantly to the country's GDP, employment generation and overall industrial growth. The recent changes in the definition of MSMEs, from an investment-based to a turnover-based approach, have brought about a significant alignment with the Goods and Services Tax regime, effectively eliminating the distinction between manufacturing and service units. According to the revised definition, the ceiling on the annual turnover of a micro enterprise is 10 crore, while the annual turnover of a small enterprise is between 10 crore and 100 crore. A medium enterprise is defined as having an annual turnover between 100 crore and 500 crore. **(Ministry of MSME).** The Indian MSME sector is a key driver of the country's economic growth, generating substantial exports, employment and industrial production, but it faces a myriad of challenges that hinder its growth and global competitiveness. **(Tripathy & Kumar, 2019).**

MSMEs are a cornerstone of the country's economic and social development, providing a platform for entrepreneurs to showcase their creativity and innovative spirit. The MSME sector has been a key driver of India's economic resilience, successfully navigating global economic turbulence and demonstrating impressive growth. **(IBEF, 2022).** The sector is a significant contributor to employment in the country, with approximately 60 million people employed across 26 million enterprises, exhibiting a higher labor intensity and growth rate. **(Rana & Choudhary, 2019).** The MSME sector generates employment for approximately 360.41 lakh individuals in manufacturing, 387.18 lakh in trade and 362.22 lakh in other services. **(Tandel, 2023).** The MSME sector is a key driver of India's economic growth, featuring a vast network of 30 million units that create substantial employment opportunities and contribute significantly to manufacturing output and exports. The MSME sector's contribution to India's manufacturing output and exports is substantial, at 45% and 40%, respectively. **(Zanjurne, 2018).** The country's handicraft MSMEs presents a complex landscape, marked by the coexistence of a large rural artisanal workforce and a significant export-oriented sector, with over 67,000 exporters catering to domestic and international markets. Handicraft MSMEs are a cornerstone of India's

economy, providing substantial employment opportunities, particularly in rural and semi-urban areas and contributing to the country's GDP. **(Agarwal et al., 2022).**

India's MSME landscape is led by Uttar Pradesh, which accounts for approximately 11.3% of the country's total MSME units, with West Bengal and Tamil Nadu in close pursuit. **(Jena & Thatte, 2018).** Uttar Pradesh stands out as the leading contributor to MSMEs, with a 28% share among the top 10 states, ahead of West Bengal and Tamil Nadu, which contribute 24% and 17%, respectively. The MSME sector's GDP share showed a consistent upward trend, increasing from 29.34% in 2014-15 to 30.27% in 2018-19, emphasizing its growing economic importance. **(Gangadhar, 2022).** The MSME sector in Gujarat comprises around 33.16 lakh enterprises, contributing significantly to the state's economy. Gujarat's MSME sector holds immense potential for driving India's economic growth and development. **(Srivastava, 2020).** Maharashtra has taken the lead in fostering a thriving MSME ecosystem, driven by its diversified sector, robust infrastructure and effective policies like the Maharashtra Industrial Policy (2020). The state of Tamil Nadu has a strong manufacturing base, with a focus on textiles, leather and auto components, backed by initiatives that promote skill development and industrial cluster growth. Uttar Pradesh's vast workforce and government-supported initiatives like the ODOP scheme are key drivers of its MSME sector's success. **(Kamini & Dadhich, 2024).** Investments in MSMEs have shown a remarkable upward trend, increasing by 64,419% between 1972-73 and 2015-16, from ₹1,054.68 crore to ₹6,89,954.86 crore. The production sector has witnessed a substantial 41,332% increase, from ₹2,602.74 crore to ₹10,77,212.86 crore, over the same period. **(Sahu & Mani, 2024).**

Micro, Small and Medium Enterprises (MSMEs) form the backbone of the Indian economy. The economy has witnessed a remarkable growth rate across all sectors, including the primary, secondary and service sectors. In the fiscal year 2016-17, the primary and secondary sectors grew at a rate of 6.4%, while the tertiary sector stood out with an impressive growth rate of 10.8%. This growth is a reflection of the economy's strength and the sectors' ability to adapt to changing market conditions. **(Team MSMEx).** This study delves into the investment-wise status of leading states of India, analyzing capital infusion and provides a turnover-wise analysis to assess revenue generation and its impact on the state's economic growth. By presenting comparative analysis of investment-wise and turnover-wise status of MSMEs of leading states in India, this study aims to provide valuable insights into the role of MSMEs in economic development of the nation.

Classification of MSMEs

Table 1: Classification of MSMEs

Sr. No.	Type of Enterprise	Investment	Turnover
1.	Micro Enterprise	Not more than ₹ 2.5 Crore	Not more than ₹ 10 Crore
2.	Small Enterprise	Not more than ₹ 25 Crore	Not more than ₹ 100 Crore
3.	Medium Enterprise	Not more than ₹ 125 Crore	Not more than ₹ 500 Crore

Source: MSME vide Notification-S.O-no-1364-E-dated-21.03.2025

Table 1 shows the revised classification for MSMEs (Micro, Small and Medium Enterprises), effective from March 21, 2025. For Micro Enterprises, the classification applies to businesses with an annual turnover of up to Rs. 10 crore and an investment of less than Rs. 2.5 crore. This category typically includes very small businesses and startups. Small Enterprises are defined as businesses with an annual turnover of up to Rs. 100 crore and an investment between Rs. 2.5 and Rs. 25 crore. These enterprises represent businesses that have outgrown the micro stage but still require support to grow. Medium Enterprises are larger, with an annual turnover of up to Rs. 500 crore and an investment between Rs. 25 crore and Rs. 125 crore. These businesses have greater capacity for production and employment, making them a crucial part of the industrial and service sectors.

Literature Review

Various empirical studies, reports of ministries, policy framework, economic survey and budgetary analysis has explored various facets of MSMEs. Analysis of Indian MSMEs has predominantly been conducted at the national level, resulting in limited insights into state-specific growth and development trends.

Table 2: Review of Existing Literature on MSMEs Development and Policy Impact

Source/ Author	Year	Methodology	Findings	Research Gap
Ministry of Micro, Small & Medium Enterprises, Government of India	2024	Budgetary Analysis	Budget allocations for MSME schemes, including Khadi and Village Industries, Technology Upgradation, PMEGP and RAMP. Emphasis on enhancing MSME competitiveness.	Requires longitudinal impact analysis on budget allocation and focus on how effectively these funds meet MSMEs growth, sustainability and employment targets.
Micro, Small and Medium Enterprises Department, Government of Tamil Nadu	2024	Policy Framework and Implementation Analysis	Outlines support for MSMEs, including financial incentives, infrastructure development, workforce, housing and green technology adoption. Key schemes include subsidies and development programs for micro-clusters and industrial estates.	Limited data on the long-term impact of these policies on MSMEs growth and the effectiveness of regional-specific programs. Further evaluation needed on policy sustainability.
Ministry of Micro, Small & Medium Enterprises	2023-24	Annual Report Analysis	MSMEs account for a significant portion of employment and economic activity in India, with notable contribution to exports, employment and rural industrialization.	Further research needed to assess the impact of specific schemes on MSMEs growth and sustainability, especially digitization initiatives.
Industries & Commerce Department, Haryana Government	2023	Policy Framework Analysis	The scheme offers financial incentives for MSMEs in the textile sector for ETP (Effluent Treatment Plants), ZLD (Zero Liquid Discharge) systems and solar rooftops.	Limited data on the adoption rate of green incentives and the long-term environmental impact on MSMEs in the textile sector. Further research is needed to assess effectiveness.
Vaidya, S. N.	2023	Literature review of MSME sector in India, focusing on growth and challenges.	MSMEs significantly impact India's economic growth through employment generation, industrialization and rural development. Despite their contributions, they face challenges in financing, infrastructure, technology and innovation.	Lack of study on overcoming persistent obstacles in MSME infrastructure, financing and technology to ensure sustainable growth and sector resilience.
Srivastava, D.P., Vineetha O.K., Mehta, T. S. Office of Development Commissioner, M/o MSME	2022	Data Analysis from Udyam Portal	80.16 lakh MSMEs registered under Udyam,with Maharashtra leading registrations. 97% had investments below Rs. 50 lakh and 88% had turnover below Rs. 1 crore.	Lacks long-term data on the financial sustainability and growth of MSMEs; need for further analysis on MSMEs' regional challenges and sector-specific policy impacts.
National Institute for Micro, Small and Medium Enterprises (ni-msme)	2022	Policy Compilation & Analysis	The document compiles various MSME support schemes, including financial assistance, skill development, infrastructure support and market access initiatives.	Limited data on the long-term impact of these schemes on MSMEs sustainability and growth; requires region-specific studies to assess effectiveness.
ICAI Committee on MSME & Startup	2022	Policy Compendium and Analysis	Detailed overview of MSME policies in Haryana, including the Industrial Investment and Employment Promotion Policy 2020, MSME Policy 2019 and others.	The report lacks an analysis of the effectiveness of these policies in terms of actual economic impact, as well as data on regional challenges faced by Haryana's MSMEs.
Kumar, O., PRS Legislative Research	2022	Budgetary and Economic Analysis	The Haryana Budget 2022-23 highlights 11% GSDP growth projection, increased expenditure in sectors like education, healthcare and urban development and a fiscal deficit goal of 3.52% of GSDP.	There is a need to assess the long-term fiscal impact of increased expenditure on healthcare and infrastructure and the sustainability of Haryana's debt levels.

Karnataka Economic Survey, Department of Industries and Commerce, Government of Karnataka	2021-22	Economic Survey Analysis	MSMEs in Karnataka contribute significantly to employment, with over 55 lakh jobs and major investments in sectors like food processing, textiles and manufacturing.	Further studies needed on post-COVID recovery challenges specific to Karnataka's MSMEs and the effectiveness of recent policy measures for sustainable growth.
Office of Development Commissioner (MSME)	2021	Data Analysis of Udyam Registration	Maharashtra leads in MSME registrations (22.3%), with micro-enterprises making up 93% of total MSMEs. Key insights include state wise employment and investment.	Need for longitudinal study on MSMEs growth patterns across states, deeper analysis of regional challenges and impact of policy interventions.
Pagaddut, J. G.	2021	Multiple Linear Regression, Factor & Cluster Analysis	Debt ratio and asset turnover negatively impact Return on Assets (ROA), while gross profit margin positively affects ROA. Two main factors- sustainability and efficiency ratios explain financial variations.	Further research required on other financial factors affecting MSMEs in diverse sectors, especially during different economic cycles.

RESEARCH METHODOLOGY

The research methodology employed in this study involves a comprehensive analysis of the investment-wise and turnover-wise status of Micro, Small and Medium Enterprises (MSMEs) in India particularly focusing on some leading states. The study is based on secondary data that is gathered from government publications, industry reports and databases such as the Udyam Registration Portal, the Ministry of Micro, Small and Medium Enterprises and relevant studies from academic journals. The data pertaining to the classification of MSMEs by investment and turnover was analyzed for the period from 2020 to 2022, providing insights into the registration and economic performance of MSMEs across Indian states. Additionally, comparative analysis of major states such as Maharashtra, Tamil Nadu, Gujarat and Haryana was carried out to assess MSMEs position in the national landscape. Statistical techniques, including descriptive analysis, were used to examine the growth patterns, employment generation and sectoral contributions of MSMEs.

The research methodology employed in this study utilizes a mixed-methods approach combining quantitative and qualitative analyses to examine the investment-wise and turnover-wise status of MSMEs in leading states of India. Through a descriptive-analytical framework, this study draws upon secondary data sources to yield a comprehensive insight into the development patterns of MSMEs. Data was collected from the Udyam Registration Portal for the period 2020-2022, encompassing state-wise MSME registration records, employment generation data, investment data and turnover data. Data sources also included government publications, Ministry of MSME annual reports, academic journals, research papers and industry reports, providing contextual depth to the analysis.

The statistical framework implemented in this study encompasses both descriptive and inferential statistical analyses. Descriptive statistics, including measure of central tendency (mean), measures of dispersion (standard deviation, variance), distribution characteristics (skewness) and relative measure (coefficient of variation), were utilized to provide a foundational understanding of the data structure. The inferential statistical analysis employed one-way ANOVA testing. For applying ANOVA, the null and alternate hypotheses are taken as follows:

Null Hypothesis (H_0) : There is no significant difference in MSMEs distribution across states.
Alternate Hypothesis (H_1) : There is significant difference in MSMEs distribution across states.

The variables under study were carefully selected to capture the multifaceted nature of MSME development. Independent variables included state location, time period (2020-2022), investment categories and turnover brackets, while dependent variables encompassed the number of MSMEs, employment generation, investment levels and turnover amounts. The data analysis process followed a systematic approach beginning with a pre-analysis phase. Then analysis phase incorporated the computation of descriptive statistics and ANOVA calculations followed by a post-analysis phase focusing on result interpretation and finding validation. The enhanced methodology undertaken in this study provides a comprehensive framework for analyzing MSME patterns across major Indian states.

FINDINGS

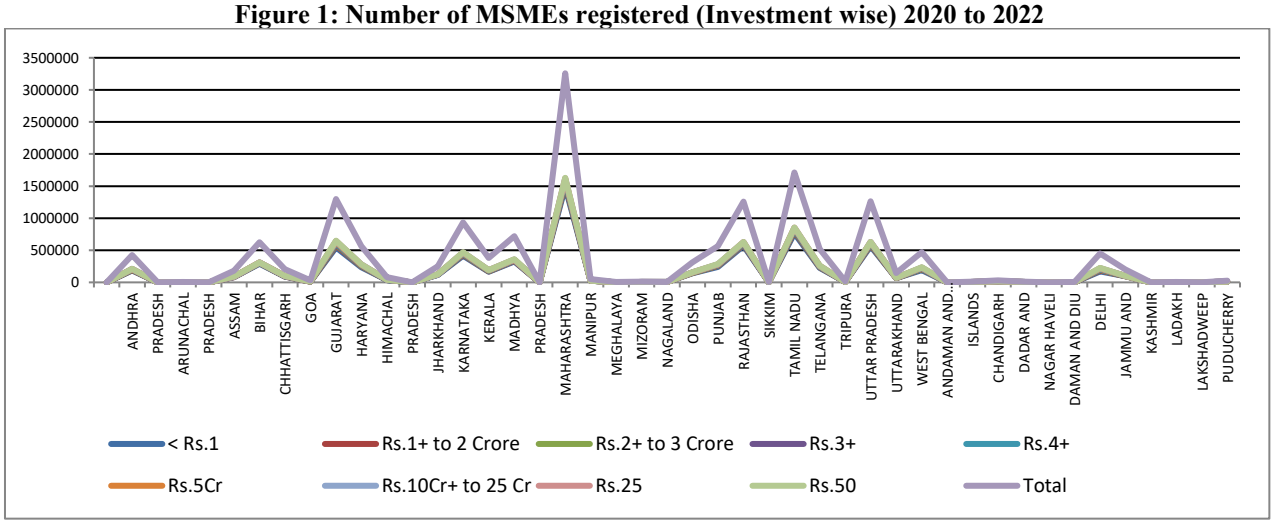
The study reveals that the shift from investment-based to turnover-based classification in MSMEs, aligned with the Goods and Services Tax (GST) regime, has simplified classification. MSMEs serve as the backbone for supply chains and ancillary industries, supporting larger enterprises across the nation. However, the sector's smaller scale compared to industrialized states like Maharashtra, Tamil Nadu and Gujarat reflects a relatively lower number of high-investment and high-turnover MSMEs in Haryana. Despite these limitations, Haryana's MSMEs play a crucial role in strengthening semi-urban and rural economies. Government initiatives like the Emergency Credit Line Guarantee Scheme (ECLGS), Raising and Accelerating MSME Performance (RAMP) and Udyam Assist Platform (UAP) have been vital in sustaining MSME sector through financial support and enabling formalization. Despite this, MSMEs face challenges like limited credit access, infrastructure gaps and skill development needs. Addressing these key areas through target policy interventions will enable MSME sector to evolve into a robust and self-sufficient sector capable of competing with other leading states.

Table 3: Number of MSMEs registered (Investment wise) 2020 to 2022

State/UT	<= Rs. 50 lakhs	Rs.50 lakhs + to 1 Crore	Rs.1 Cr+ to 5 Crore	Rs.5 Cr+ to 10Cr	Rs.10Cr+ to 25Cr	Rs.25Cr+ to 50Cr	Total
Andhra Pradesh	206449	2965	2817	447	259	81	213018
Arunachal Pradesh	2821	76	68	6	3	1	2975
Assam	86917	1048	1046	209	64	23	89197
Bihar	309238	1374	850	103	49	17	311631
Chhattisgarh	98285	1706	1625	223	118	40	101797
Goa	13986	299	334	35	25	10	14687
Gujarat	**620081**	**12079**	**12836**	**1848**	**1092**	**384**	**648231**
Haryana	**270931**	**5260**	**5449**	**746**	**392**	**88**	**282866**
Himachal Pradesh	38189	604	740	139	54	25	39766
Jharkhand	123922	1266	1062	111	73	15	126449
Karnataka	453822	6522	6143	872	726	212	467959
Kerala	184301	3082	2565	361	166	31	190506
Madhya Pradesh	351364	3398	3112	446	206	63	358598
Maharashtra	**1594715**	**15599**	**15125**	**2173**	**1278**	**370**	**1629260**
Manipur	24103	113	88	44	5	1	24316
Meghalaya	2793	45	73	11	3	1	2926
Mizoram	4494	88	54	7	5	0	4628
Nagaland	3920	53	48	5	5	0	4030
Odisha	151413	1958	1783	236	82	35	155507
Punjab	274941	4067	3346	440	214	50	283058
Rajasthan	617994	5969	5327	616	408	137	633951
Sikkim	2054	15	35	8	3	0	2115
Tamil Nadu	**833302**	**10267**	**9755**	**1388**	**840**	**188**	**857745**
Telangana	250347	4067	4310	682	404	115	259925
Tripura	8260	82	53	22	5	3	8425
Uttar Pradesh	618754	6498	5713	766	432	95	632258
Uttarakhand	70621	840	894	151	64	20	72590
West Bengal	226317	3595	3621	524	283	66	234406
Andaman And Nicobar Islands	4688	75	34	2	4	0	4803
Chandigarh	14630	298	256	45	24	10	15263
Dadar And Nagar Haveli	4541	154	215	30	26	5	4971
Daman And Diu	2020	119	160	24	17	5	2345
Delhi	214398	4886	4587	661	396	117	225400
Jammu And Kashmir	99366	886	584	71	38	14	100924
Ladakh	2936	59	37	6	1	0	3039
Lakshadweep	245	1	0	0	0	0	246
Puducherry	11818	167	148	22	9	5	12169

Source:- Udyam Registration Publication, 2020-22

Figure 1: Number of MSMEs registered (Investment wise) 2020 to 2022



Source: constructed on the basis of data contained in table 3

Table 3 and **figure 1** categorizes MSMEs across Indian states based on the investment size, ranging from less than Rs. 50 lakhs to Rs. 50 crore. When contrasted with leading states like Maharashtra, Tamil Nadu and Gujarat, Haryana's numbers, while substantial, fall behind these industrial giants. Maharashtra, with 1.59 million MSMEs under Rs. 50 lakhs, is the leading state, followed by Tamil Nadu with 833,302 MSMEs and Gujarat with 620,081 MSMEs in the same category. In terms of higher investments (Rs. 5 crore and above), states like Maharashtra, Tamil Nadu and Gujarat again lead with a significantly larger number of MSMEs compared to Haryana.

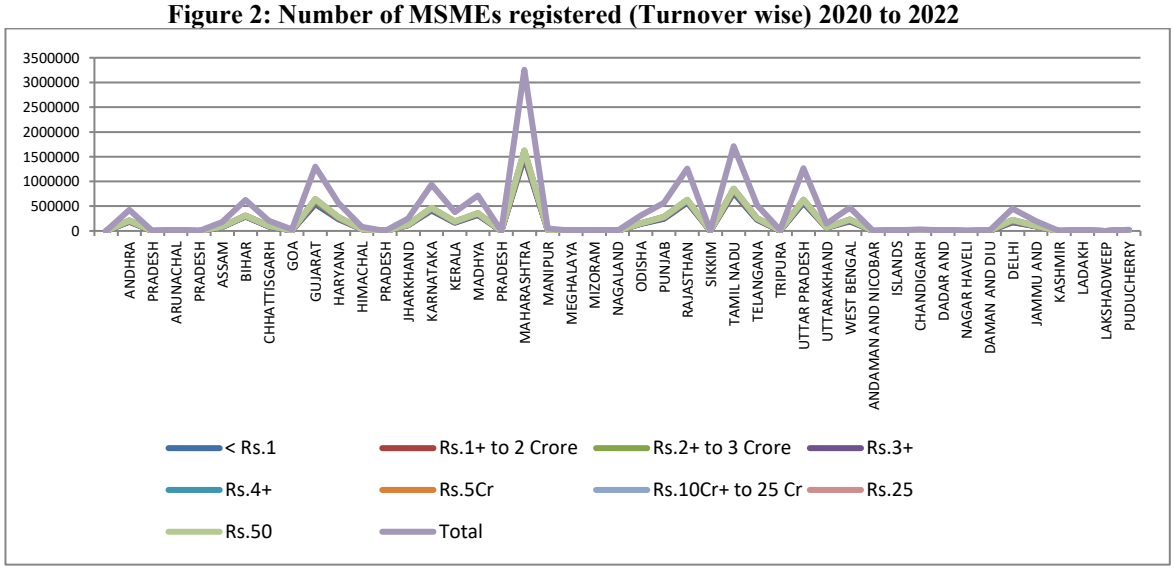
Table 4: Number of MSMEs registered (Turnover wise) 2020 to 2022

State/UT	< Rs.1 Crore	Rs.1+ to 2 Crore	Rs.2+ to 3 Crore	Rs.3+ to 4 Crore	Rs.4+ to 5 Crore	Rs.5Cr + to 10Cr	Rs.10Cr+ to25 Cr	Rs.25 Cr+ to 50Cr	Rs.50 Cr+ to 250Cr	Total
ANDHRA PRADESH	183599	8352	4491	3049	2077	5104	4074	1389	883	213018
ARUNACHAL PRADESH	2750	67	33	17	16	33	33	13	13	2975
ASSAM	79797	2614	1395	900	670	1635	1384	514	288	89197
BIHAR	292398	6419	3134	1887	1351	3132	2283	631	396	311631
CHHATTISGARH	90082	3139	1673	1115	823	2066	1830	707	544	101979
GOA	12565	640	350	222	150	348	248	85	79	14687
GUJARAT	**543181**	**30941**	**16281**	**10330**	**7281**	**17317**	**13862**	**5355**	**3683**	**648231**
HARYANA	**237020**	**13489**	**6880**	**4499**	**3253**	**7793**	**6126**	**2248**	**1558**	**282866**
HIMACHAL PRADESH	35198	1389	650	398	296	731	629	264	213	39768
JHARKHAND	115855	3402	1681	1060	724	1663	1316	471	277	126449
KARNATAKA	413188	16251	8357	5324	3722	9232	7265	2715	1905	467959
KERALA	165947	7175	3726	2350	1739	4165	3549	1141	714	190506
MADHYA PRADESH	324026	10076	5127	3405	2490	6285	4767	1466	947	358589
MAHARASHTRA	**1489441**	**41512**	**20758**	**13230**	**9270**	**22731**	**18851**	**7532**	**5935**	**1629260**
MANIPUR	23716	187	94	42	39	107	81	38	9	24313
MEGHALAYA	2551	93	48	33	27	60	64	27	23	2926
MIZORAM	4454	73	39	19	8	30	23	7	5	4658
NAGALAND	3865	60	25	11	15	25	18	6	5	4030
ODISHA	139470	5113	2582	1604	1086	2482	2058	686	426	155507
PUNJAB	243058	13011	6299	3942	2806	6583	4537	1618	1204	283058
RAJASTHAN	572352	18799	9114	5641	4009	9282	7182	2447	1505	630331
SIKKIM	1955	45	27	11	12	25	28	7	5	2115
TAMIL NADU	**766723**	**28502**	**14057**	**8708**	**6033**	**14571**	**10912**	**3727**	**2507**	**855740**

TELANGANA	228110	8458	4529	3049	2230	5662	4601	1828	1458	259925
TRIPURA	7477	315	153	97	56	148	97	40	17	8400
UTTAR PRADESH	565508	20469	10398	6382	4729	11245	8630	2891	2006	632258
UTTARAKHAND	64859	2366	1163	751	490	1312	1045	354	250	72590
WEST BENGAL	192245	12627	6247	3908	2770	6991	5864	2206	1548	234406
ANDAMAN AND NICOBAR ISLANDS	4313	173	81	40	41	75	59	16	5	4803
CHANDIGARH	12389	776	420	300	213	500	398	141	126	15263
DADAR AND NAGAR HAVELI	3922	288	138	87	54	163	172	70	77	4971
DAMAN AND DIU	1648	149	78	71	43	122	117	64	53	2345
DELHI	172255	14138	7575	5047	3685	9092	7607	3153	2493	225045
JAMMU AND KASHMIR	93861	2843	1180	680	447	954	679	185	113	100942
LADAKH	2914	54	20	13	6	16	11	5	0	3039
LAKSHADWEEP	242	3	0	0	1	0	0	0	0	246
PUDUCHERRY	10780	416	200	147	80	233	177	87	49	12169

Source: Udyam Registration Publication, 2020-22

Figure 2: Number of MSMEs registered (Turnover wise) 2020 to 2022



Source: constructed on the basis of data contained in table 4

Table 4 and **figure 2** presents MSMEs categorized based on their turnover, from less than Rs. 1 crore to Rs. 50 crore and above. States like Gujarat, Maharashtra and Tamil Nadu have significantly higher numbers of MSMEs as compared to Haryana. Gujarat leads the nation with 543,181 MSMEs with turnover less than Rs. 1 crore, followed by 148,9441 MSMEs in Maharashtra and 766,723 MSMEs in Tamil Nadu. The number of MSMEs in these states with turnovers exceeding Rs. 5 crore is also considerably higher than in Haryana, reflecting the greater industrial capacity and business diversity in these states.

Statistical Analysis of MSMEs Investment Patterns Across Major States

DESCRIPTIVE STATISTICAL ANALYSIS

The descriptive analysis of MSME data across major Indian states reveals significant insights into the sector's structure and distribution. The arithmetic mean ($\bar{x} = \sum x/n$) calculations demonstrate substantial variations among states, with Maharashtra exhibiting the highest average number of MSMEs ($\bar{x}$ = 271,543.33), followed by Tamil Nadu ($\bar{x}$ = 142,623.33), Gujarat ($\bar{x}$ = 108,053.33) and Haryana ($\bar{x}$ = 47,144.33).

This central tendency measure highlight the concentration of MSME activities in industrially advanced states. The dispersion metrics, particularly the standard deviation ($\sigma = \sqrt{[\sum(x - \bar{x})^2/n-1]}$), indicate considerable variability in the distribution of MSMEs across investment categories. Maharashtra shows the highest standard deviation (σ = 648256.09), reflecting greater diversity in its MSME sector, while Haryana exhibits a lower standard deviation (σ = 109659.61), indicating a more homogeneous distribution. The coefficient of variation ($CV = (\sigma/\bar{x}) \times 100$) reveals notable patterns in relative variability. Despite differences in absolute numbers, all states show remarkably similar CV values exceeding 200% (Maharashtra: 238.73%, Tamil Nadu: 237.26%, Gujarat: 232.20%, Haryana: 232.60%), indicating comparable relative dispersions across states regardless of their MSME sector size. The range statistics further emphasize the scale differences between states, with

Maharashtra showing the widest range 1,594,345(1594715 - 370) and Haryana the narrowest 270,843(270931 – 88), reflecting the varying breadth of MSMEs across different investment categories.

Descriptive Statistics Results[1]

Table 5: Descriptive statistics results for Investment categories across states

State	Mean Investment	Standard Deviation	Variance	Coefficient of Variation	Interpretation
Maharashtra	271,543.33	648256.09	420235958222.09	238.73%	Indicates high variability in investment distribution
Tamil Nadu	142,623.33	338392.36	114509389306.37	237.26%	Shows moderate variability
Gujarat	108,053.33	250903.45	62952541221.90	232.20%	Demonstrates consistent investment pattern
Haryana	47,144.33	109659.61	12025230065.35	232.60%	Shows lowest variability among compared states

Table 6: Skewness value for the states[2]

State	Maharashtra	Tamil Nadu	Gujarat	Haryana
Skewness value	2.4488	2.4485	2.4467	2.4468

The distribution characteristics, analyzed through skewness measure, reveal consistently positive skewness across all states, indicating a concentration of MSMEs in lower investment categories with fewer enterprises in higher investment brackets. This pattern is particularly pronounced in the micro-enterprise segment, where the majority of businesses are clustered. The investment-wise classification data shows that approximately 95% of MSMEs across all states fall into the lowest investment category (≤ Rs. 50 lakhs), demonstrating the sector's characteristic pyramid structure.

INFERENTIAL STATISTICAL ANALYSIS

The ANOVA (Analysis of Variance) conducted on the investment wise MSME data reveals significant insights into the structural differences and similarities across major Indian states. The one-way ANOVA computation, based on the formula F = MSB/MSW (where MSB represents Mean Square Between groups and MSW represents Mean Square Within groups), yields meaningful results. The investment-wise analysis produced an F-statistic of 0.3534 (df between = 3, df within = 20, $\alpha = 0.05$), indicating statistically significant variations in MSME investment patterns across states. The Sum of Squares Between groups ($SSB = \sum n_i(\bar{x}_i - \bar{x})^2$) calculations demonstrate substantial inter-state variations, particularly evident in the comparison between Maharashtra and Haryana, with Maharashtra showing significantly higher group means across investment categories. The Mean Square calculations (MSB = SSB/dfb and MSW = SSW/dfw) further illuminate the variance structure within the MSME sector. The Mean Square Between groups (MSB = 5.386 × 1010) compared to the Mean Square Within groups (MSW = 1.5243 × 1011) yields insights into both inter-state variations and intra-state heterogeneity. The Within-group variation, calculated through Sum of Squares Within groups [$SSW = \sum\{\sum(x_{ij} - \bar{x}_i)^2\}$], reveals significant heterogeneity within each state's MSME sector, particularly in investment patterns and operational scale.

Inferential Statistics Results[3]

Table 7: ANOVA result summary table

Source of Variation	SS (Sum of Squares)	df	MS(Mean Square)	F	P value	F crit (α = 0.05)
Between Groups	16158832484.501	3	53862744162	0.3534	0.7871 91346	3.10
Within Groups	3,048,615,681,785.32	20	152430784089.27			
Total	**3,210,203,914,269.820**	**23**				

Decision and Interpretation

The comprehensive statistical analysis through one-way ANOVA of MSMEs distribution (Investment wise) across selected industrialized states reveals intricate patterns and relationships in the sector's structure and development. The obtained F-statistic of 0.3534, being less than the critical value of 3.10 at $\alpha = 0.05$ level of significance, leads to the non-rejection of the null hypothesis, suggesting that while numerical differences exist between states, these variations are not statistically significant when considered against the substantial within-state variability. This statistical outcome underscores a fundamental characteristic of India's MSME sector - the presence of consistent structural patterns across states despite varying scales of operation.

Contribution of MSMEs to the Country's Economy

As reported by the Ministry of Statistics & Programme Implementation, MSME'S GVA constituted a significant share

[1] *The results are as per calculations given in the appendix.*
[2] *The results are as per calculations given in the appendix.*
[3] *The results are as per calculations given in the appendix.*

of India's GDP, with 30.5% in 2019-20, 27.2% in 2020-21 and 29.2% in 2021-22. Additionally, MSMEs accounted for a substantial portion of India's manufacturing output during the years 2019-20, 2020-21 and 2021-22, with percentages of 36.6%, 36.9% and 36.2% respectively. Furthermore, data from the Directorate General of Commercial Intelligence and Statistics (DGCIS) shows that MSME-specified products contributed 49.4%, 45.0% and 43.6% of India's total exports during the years 2020-21, 2021-22 and 2022-23 respectively. As of August 2, 2023, the Udyam Registration Portal reported that MSMEs registered between July 1, 2020 and August 1, 2023, employed a total of 12,36,15,681 people. MSMEs exports have shown remarkable growth, escalating from ₹3.95 lakh crore in 2020-21 to ₹12.39 lakh crore in 2024-25, emphasizing their significance in propelling India's economic development and strengthening international trade ties.

Actionable Insights from the analysis

The practical implications of the findings extend beyond mere statistical significance, offering valuable insights for policy formulation and implementation. The similar distributional patterns observed across states, particularly the high concentration in the micro-enterprise segment, suggest that basic structural challenges and opportunities in the MSME sector may be addressed through nationally coordinated policies, while acknowledging the need for state-specific interventions based on scale and local context.

The high within-group variation, while statistically overshadowing between-group differences, actually reveals the complex and diverse nature of MSME ecosystems within each state. This diversity suggests that while state-level policies are important, micro-level interventions targeting specific MSME segments might be equally crucial for sector development. Furthermore, the consistent structural patterns observed across states, despite varying scales of operation, indicate that successful policy initiatives and development strategies might be adaptable across regions, with appropriate modifications for local context and scale of operations.

CONCLUSION

This study has explored the investment-wise and turnover-wise status of MSMEs offering insights into comparative evaluation of leading states of India. The shift from an investment-based to a turnover-based classification has enabled better support and classification of MSMEs, particularly in terms of accessing government schemes and incentives. The MSME sector plays an essential role in economic landscape, contributing to regional development, employment generation and industrial growth. MSMEs, particularly in sectors like auto parts, textiles, electronics and food processing, continue to strengthen the state's semi-urban and rural economies. Despite being smaller in scale compared to industrialized states like Maharashtra, Tamil Nadu and Gujarat, the MSME sector in Haryana remains a critical contributor to both employment and economic output, with over 4.1 million individuals employed between 2020 and 2024. However, challenges such as limited access to credit and a lower number of MSMEs with higher investment and turnover remain areas for improvement. Continued support through targeted policy interventions, financial accessibility and skill development programs.

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APPENDIX

DESCRIPTIVE AND INFERENTIAL STATISTICS CALCULATIONS

Descriptive and inferential statistics calculations are based on the data contained in following Table:

Table 8 : Investment-wise MSME data for major states

Investment Category	No. of MSMEs			
	Maharashtra	Tamil Nadu	Gujarat	Haryana
≤ Rs.50L	1594715	833302	620081	270931
Rs.50L-1Cr	15599	10267	12079	5260
Rs.1-5Cr	15125	9755	12836	5449
Rs.5-10Cr	2173	1388	1848	746
Rs.10-25Cr	1278	840	1092	392
Rs.25-50Cr	370	188	384	88

DESCRIPTIVE STATISTICS CALCULATIONS

1. Calculation of Means

Grand Mean ($\bar{x}$) = (Sum of all observations[4])/(Total number of observations)
= 3,416,186/24
= 142,341.08

Group Means:

For Maharashtra state → ($\bar{x}_1$) = (1594715+15599+15125+2173+1278+370)/6 = 271,543.33
For Tamil Nadu state → ($\bar{x}_2$) = (833302+10267+9755+1388+840+188)/6= 142,623.33
For Gujarat state → ($\bar{x}_3$) = (620081+12079+12836+1848+1092+384)/6 = 108,053.33
For Haryana state → ($\bar{x}_4$) = (270931+5260+5449+746+392+88)/6 = 47,144.33

[4] *For calculation of sum, 24 observations as in the table 8 are undertaken.*

2. Calculation of Standard Deviation and Variance

$$\text{Standard Deviation} = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$

Here, x_i **:** Individual data values, $\bar{x}$ **:** Mean of the data values,
n : no. of observations,
$\sum(x_i - \bar{x})^2$ **:** Sum of squared deviations from the mean,
n−1 is the denominator (known as Bessel's correction) to calculate the sample standard deviation, which provides an unbiased estimate.

Standard Deviation for Maharashtra state

$\sum(x_{ij} - \bar{x}_1) = (1594715-271543.33)^2 + (15599-271543.33)^2 + (15125-271543.33)^2 + (2173-271543.33)^2 + (1278-271543.33)^2 + (370-271543.33)^2$
$= 2,101,179,826,497.33$
n-1 = 6-1 = 5
$\sigma_1 = \sqrt{[2,101,179,826,497.33/5]} = 648256.09$

Standard Deviation for Tamil Nadu state

$\sum(x_{ij} - \bar{x}_2) = (833302-142623.33)^2 + (10267-142623.33)^2 + (9755-142623.33)^2 + (1388-142623.33)^2 + (840-142623.33)^2 + (188-142623.33)^2$
$= 572,546,970,739.33$

n-1 = 6-1 = 5
$\sigma_2 = \sqrt{[572,546,970,739.33/5]} = 338392.36$

Standard Deviation for Gujarat state

$\sum(x_{ij} - \bar{x}_3) = (620081-108053.33)^2 + (12079-108053.33)^2 + (12836-108053.33)^2 + (1848-108053.33)^2 + (1092-108053.33)^2 + (384-108053.33)^2$
$= 314,762,729,655.33$
n-1 = 6-1 = 5
$\sigma 3 = \sqrt{[314,762,729,655.33/5]} = 250903.45$

Standard Deviation for Haryana state

$\sum(x_{ij} - \bar{x}_4) = (270931-47144.33)^2 + (5260-47144.33)^2 + (5449-47144.33)^2 + (746-47144.33)^2 + (392-47144.33)^2 + (88-47144.33)^2$
$= 60,126,154,893.33$
n-1 = 6-1 = 5
$\sigma_4 = \sqrt{[60,126,154,893.33/5]} = 109659.61$

Variance

Variance = (Standard Deviation)$^2 = \sigma^2$
Variance for Maharashtra state = $(648256.09)^2 = 420235958222.09$
Variance for Tamil Nadu state = $(338392.36)^2 = 114509389306.37$
Variance for Gujarat state = $(250903.45)^2 = 62952541221.90$
Variance for Haryana state = $(109659.61)^2 = 12025230065.35$

3. Calculation of Coefficient of variation

$$C.V. = \frac{\sigma}{\bar{x}} \times 100$$

Coefficient of variation for Maharashtra state
$C.V._1 = 648256.09/271,543.33 \times 100 = 238.73\%$

Coefficient of variation for Tamil Nadu state
$C.V._2 = 338392.36/142,623.33 \times 100 = 237.26\%$

Coefficient of variation for Gujarat state
$C.V._3 = 314,762,729,655.33/108,053.33 \times 100 = 232.20\%$

Coefficient of variation for Haryana state
$C.V._4 = 109659.61/47,144.33 \times 100 = 232.60\%$

4. Calculation of Skewness

$$\text{Skewness} = \frac{n\sum(x_i - \bar{x})^3}{(n-1)(n-2)(\sigma^3)}$$

Here, $\mathbf{x_i}$ **:** Individual data values, $\bar{\mathbf{x}}$ **:** Mean of the data values,
n : no. of observations
by plotting the values calculated above in the formula of skewness, the results are:
Skewness for Maharashtra state = 2.4488
Skewness for Tamil Nadu state = 2.4485
Skewness for Gujarat state = 2.4467
Skewness for Haryana state = 2.4468

INFERENCIAL STATISTICS

One Way ANOVA
Selection Framework
For the purpose of focused comparative analysis, this study employs a strategic sampling approach focusing on key industrialized states. The selection of Maharashtra, Tamil Nadu, Gujarat and Haryana is based on the following criteria:

1. **Industrial Development Index**
   - States representing diverse levels of industrial development
   - Maharashtra and Gujarat as established industrial leaders
   - Tamil Nadu representing strong manufacturing base
   - Haryana as an emerging industrial hub
2. **Economic Indicators**
   - Contribution to national GDP
   - Industrial output
   - MSME density per capita
   - Export contribution

Research Focus
- Benchmark comparison of established MSME ecosystems
- Regional representation (North and West India)

This selective analysis provides focused insights while acknowledging that a comprehensive understanding of national MSME dynamics would require consideration of all states and Union Territories.
The **one-way ANOVA** analysis was conducted to examine differences in MSME investment patterns across selected industrialized states (Maharashtra, Tamil Nadu, Gujarat and Haryana). The data encompasses six investment categories ranging from ≤ Rs.50 lakhs to Rs.25-50 crores. The results indicate significant variation in MSME distributions.

INFERENCIAL STATISTICS CALCULATIONS

ONE WAY ANOVA ANALYSIS

1. Calculation of Means
Grand Mean ($\bar{x}$) = (Sum of all observations)/(Total number of observations)
= 3,416,186/24
= 142,341.08

Group Means:
For Maharashtra state → ($\bar{x}_1$) = (1594715+15599+15125+2173+1278+370)/6 = 271,543.33
For Tamil Nadu state → ($\bar{x}_2$) = (833302+10267+9755+1388+840+188)/6= 142,623.33
For Gujarat state → ($\bar{x}_3$) = (620081+12079+12836+1848+1092+384)/6 = 108,053.33
For Haryana state → ($\bar{x}_4$) = (270931+5260+5449+746+392+88)/6 = 47,144.33

2. Sum of Squares Between Groups (SSB)

SSB = $\sum n_i (\bar{x}_i - \bar{x})^2$
Here, $\bar{\mathbf{x}}$ **:** Grand mean, $\mathbf{n_i}$ **:** number of observations in each group
$\bar{\mathbf{x}}_\mathbf{i}$ **:** Mean of each state under consideration, $\sum$ **:** Summation/Total
SSB = $6[(271,543.33 - 142,341.08)^2 + (142,623.33 - 142,341.08)^2 + (108,053.33 - 142,341.08)^2 + (47,144.33 - 142,341.08)^2] = 161588232484.501$

3. Sum of Squares Within Groups (SSW)

SSW = $\sum[\sum(x_{ij} - \bar{x}_i)^2]$

Here, $\mathbf{x_{ij}}$ **:** Value in a specific category, $\sum$ **:** Summation/Total

$\bar{\mathbf{x}}_\mathbf{i}$ **:** Mean of each state under consideration

SSW = SSW of Maharashtra state + SSW of Tamil Nadu state + SSW of Gujarat state + SSW of Haryana state

SSW of Maharashtra state = $(1594715-271543.33)^2 + (15599-271543.33)^2 + (15125-271543.33)^2 + (2173-271543.33)^2 + (1278-271543.33)^2 + (370-271543.33)^2$
= 2,101,179,826,497.33

SSW of Tamil Nadu state = $(833302-142623.33)^2 + (10267-142623.33)^2 + (9755-142623.33)^2 + (1388-142623.33)^2 + (840-142623.33)^2 + (188-142623.33)^2$
= 572,546,970,739.33

SSW of Gujarat state = $(620081-108053.33)^2 + (12079-108053.33)^2 + (12836-108053.33)^2 + (1848-108053.33)^2 + (1092-108053.33)^2 + (384-108053.33)^2$
= 314,762,729,655.33

SSW of Haryana state = $(270931-47144.33)^2 + (5260-47144.33)^2 + (5449-47144.33)^2 + (746-47144.33)^2 + (392-47144.33)^2 + (88-47144.33)^2$
= 60,126,154,893.33

Total SSW = 2,101,179,826,497.33 + 572,546,970,739.33 + 314,762,729,655.33 + 60,126,154,893.33 = **3,048,615,681,785.32**

4. Total Sum of Squares (SST)

SST = SSB + SSW

= 161588232484.501 + 3,048,615,681,785.32 = 3,210,203,914,269.820

5. Degrees of Freedom

1. Between Groups (dfb) = k - 1 = 4 - 1 = 3
2. Within Groups (dfw) = N - k = 24 - 4 = 20
3. Total (dft) = N - 1 = 24 - 1 = 23

k represents no. of groups, **N** represents total no. of observations

6. Calculation of Mean Squares

Mean Square Between (MSB) :

MSB = SSB/dfb = 161588232484.501/3 = 53862744162

Mean Square Within (MSW):

MSW = SSW/dfw = 3,048,615,681,785.32/20 = 152430784089.27

7. Calculation of F-Statistic

F = MSB/MSW = 53862744162/152430784089.27 = 0.353358703

ANOVA results in summarized form

Source of Variation	SS(Sum of Squares)	df	MS(Mean Square)	F	P value	F crit (α=0.05)
Between Groups	161588232484.501	3	53862744162	0.3534	0.787191346	3.10
Within Groups	3,048,615,681,785.32	20	152430784089.27			
Total	**3,210,203,914,269.820**	**23**				