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Research Paper

Patterns of Credit Flow and its Impact on Production and Productivity in Micro, Small and Medium Enterprise in India

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Abstract
Micro, Small, and Medium Enterprises (MSMEs) plays crucial role in economic growth of the country. Accessibility of credit is therefore mandatory for MSMEs to meet necessary capital requirement so that they could continue to contribute significantly in sustaining high growth of the country's economy. In this context, our study focuses on the pattern of credit flow to the MSME sector and to assess its effect on the output of manufacturing and service segments of MSMEs, along with overall MSME sector for the period 2007-08 to 2023-24. Our findings indicate that overall credit flow has expanded unevenly across enterprises. However, flow of outstanding credit per unit of enterprise is far more in the case of manufacturing segment of MSMEs than in the case of service sector enterprises. Impact of credit has been positive and significant on output of MSME engaged in manufacturing and service sectors both. But the effect of credit on output in case of manufacturing sector is more dominant and stronger than in the case of service sector. Moreover, the impact of credit per unit on the productivity of MSMEs too has been significant for both the sub sectors but again its impact on manufacturing is more prominent than in case of the service sector. Hence, credit requirements of both the sectors are different owing to the distinct characteristics of the subsectors that is why, the introduction of composite definition for manufacturing and service enterprises since 2020, is not an appropriate step. Rather investment limit for the both the segments of MSMEs should be different with higher investment limit for manufacturing than for the service sector.

Keywords: *Flow of credit to MSMEs, Credit outstanding per unit of enterprise, Worker per unit of enterprise*
JEL Classification*: D22, E51, J21, O14*

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I. Introduction

The term 'Micro, Small, and Medium Enterprises' (MSME) was established with the enactment of the Micro, Small and Medium Enterprises Development Act 2006, which upgraded the investment limits and renamed the erstwhile small-scale industrial units to include medium enterprises, thereby creating a three-tier structure consisting of Micro, Small, and Medium Enterprises for the first time. Subsequently, on 1st June 2020, the government of India revised the definition of Micro, Small, and Medium Enterprises for two reasons: firstly, to incorporate the increase in inflation over the period in newly raised investment limits and secondly, aiming to resolve the constricted growth of the Micro, Small and Medium Enterprises (RBI/2020-2021/10- notifications). These units have been defined in terms of investments made in the 'plant and machinery or equipment' and 'turnover'. According to the new definition that came into effect on 1st June 2020, a micro enterprise is one in which the investment in plant and machinery or equipment does not exceed ₹ 1 crore and the turnover does not exceed ₹ 5 crore. A small enterprise is defined as an enterprise with an investment up to ₹10 crore and turnover up to ₹50 crore, while a medium enterprise is one with an investment up to ₹50 crore and turnover up to ₹250 crore. Besides this, the government had also abolished the distinction in the definition of manufacturing and service enterprises existed prior to 2020. Subsequently, in 2025, the Government of India raised the investment limits in 'plant, machinery and equipment' and 'turnover' for MSMEs once again aiming to further support their

expansion and competitiveness. The new framework, which came into effect on 1st April 2025, significantly increased the investment and turnover limits given as follows- a micro enterprise is now defined as one with an investment of up to ₹2.5 crore and a turnover of up to ₹10 crore. A small enterprise is classified as having an investment of up to ₹25 crore and a turnover of up to ₹100 crore, while a medium enterprise is one with an investment of up to ₹125 crore and a turnover of up to ₹500 crore (Ministry of MSME, 2025). But it is here to mention that the nomenclatures and investment ceilings in 'plant and machinery' and 'equipment' originally introduced in 2006 were intended to benefit the MSMEs; however, the recent changes have prompted us to question whether they genuinely address the need of manufacturing and service sector enterprises in per unit terms as the substantial productivity differentials exists for both the sector of MSMEs (Awasthi & Singh, 2024).

Since an estimated 7.34 crore number of units in MSMEs are employing about 26 crore individuals in the country, the MSME sector plays a pivotal role in facilitating the nation's socioeconomic development. Simultaneously, this sector also promotes entrepreneurship, innovation, and economic resilience (SIDBI, 2025). And for investing in technological upgradation, capacity expansion, and working capital, the access to adequate and timely credit becomes a necessary factor for enterprises that's why the betterment of MSMEs largely depends on credit availability. And according to the guidelines of RBI, credit is extended to the MSMEs under the priority sector lending. Interestingly, due to the high employability of MSMEs, second only to agriculture, this sector has been at the center of the priority sector since its inception. The priority sector was established in 1972 by the Reserve Bank of India. Subsequently, based on the recommendations of the Working Group on Modalities of Implementation of Priority Sector Lending and the Twenty Point Economic Programme by Banks, all commercial banks were advised to achieve a target of priority sector lending set at 40 % of total bank advances from 1980 (Krishnaswamy K.S., 1980). In this line, according to Reserve Bank of India, 7.5 % of the Adjusted Net Bank Credit of banks was set as a target to be disbursed to micro enterprises only, to ensure they are not being excluded from the access to credit by other enterprises in the sector (Master Circular- Lending to MSME sector, 2015-16).

In addition to this, many initiatives were taken to facilitate credit to MSMEs; the Prime Minister Task Force on MSMEs recommended banks to maintain a 20% annual growth in credit to MSEs and allocate 60% to micro-enterprises from the total advances to MSEs (Government of India, 2010). RBI has also directed the public sector banks to establish more specialized branches in the areas mainly concentrated by the clusters of MSMEs (Master Circular- Lending to MSME sector, 2015-16). However, how these initiatives influenced the flow of credit to MSMEs from 2007-08 is under consideration. That is why we have examined the influence of outstanding credit on the output of the sector and to what extent the other variables, like employment and number of units, are effective in determining the output.

Thus, this study aims to elucidate the trends in outstanding credit to MSMEs from 2007-08 and scrutinize the disparities in credit extended to manufacturing and service enterprises within the MSME framework. Subsequently, analysis is conducted to assess the impact of outstanding credit on the output of MSME sector as well as both the segments viz manufacturing and service sector enterprises. Before we analyse the pattern in credit flow to MSME, it is necessary to review the various studies pertaining to it.

II. Literature Review

Building on the understanding of MSMEs and the significance of credit in their growth, the literature review examines prior studies that explore this relationship. It highlights how access to finance affects MSME performance. This review also helps in identifying the gaps that remain to be addressed.

One of studies analysing the pattern of credit flow to MSME sector is undertaken by Nair & Das (2019) investigating the long-term flow of institutional credit to India's Micro and Small Enterprises from the 1980 to 2018, with a focus on understanding whether policy reforms and financial inclusion initiatives have improved credit access. The objective was to assess how definitional shifts, institutional restructuring, and flagship schemes have influenced the availability of bank finance for MSEs, particularly after the enactment of the MSMED Act, 2006. Although the outstanding credit has increased but the share of MSME credit in both non-food credit and priority sector advances has steadily declined, with service-sector enterprises benefiting marginally while manufacturing MSEs faced stagnation. The authors conclude that pro-market financial inclusion rhetoric and institutional restructuring have left the structural bottlenecks still unresolved. In this line, Kannan and Sudalaimuthu (2014) examines the trend in credit flow to MSMEs in India from 1991 to 2013-14. And they emphasised on the necessity of augmenting bank credit to MSMEs. Moreover, Shaikh and Mandviwala, (2025) had assessed the pattern in credit outstanding to MSME sector in India utilising secondary data provided the Reserve Bank of India. It has been observed that there was a substantial recovery in amount of lending to MSMEs after pandemic, illustrating the effectiveness of governmental support and the resilience of MSMEs during the pandemic. In addition to this, government initiatives, including mandates for priority sector lending and digitalisation, significantly enhanced formal credit availability. Furthermore, a study that examines the trends in credit flow and the impact of credit on the output of the MSMEs is conducted by Bahera & Wahi (2019). They comprehensively analysed trends in credit flow to MSMEs spanning 2007 to 2018. They concluded that the

MSMEs remained highly credit-dependent, and economic shocks can significantly disrupt their growth. In this line, the objective of the study conducted by Meylania and Rebecca (2024) is to analyse whether the amount of bank loans and changes in interest rates affects the sales growth of micro MSMEs or not. The study's findings highlight three important insights. First, the amount of loans received by micro enterprises has a positive and significant impact on their sales growth, reaffirming the crucial role of affordable credit in supporting business expansion and market competitiveness. Second, interest rates were found to have no significant relationship with sales growth. Finally, the study emphasizes the need for more inclusive financing policies that ensure easier access to credit, coupled with capacity-building initiatives in financial management for micro entrepreneurs. In addition, stronger collaboration between government institutions, banks, and fintech platforms is recommended to create a more supportive ecosystem that broadens Micro, Small and Medium Enterprises' access to credit and strengthens their ability to grow sustainably.

It is to be noted that the production approach methodology for analysing the impact of real balances (loans and credit) on output was inspired by Friedman's (1969) theory of the optimal quantity of money, which posits that money should be regarded as a productive input akin to capital and labour in illustrating firm behaviour. A study by Ramcharran H. (2016) has shown access to finance is closely linked with performance and efficiency of SMEs. They have analysed the relation in efficiency parameters namely – the output elasticity of labours, output elasticity of the bank loans and returns to scale in SMEs from 1978-79 to 2012-13. It was found that the returns to scale in SMEs improved on the account of the positive and significantly increasing productivity of credit. But output elasticity of labour was found to be negative throughout the period concluding that labour productivity needs to be augmented. Thus, productivity of credit is the main driver of enhancement in overall productivity of SMEs throughout the period from 1978-79 to 2012-13. In this line, Wicaksono (2022) investigates how the two factors namely labour and capital investments affects the productivity and exports of MSME sector in Indonesia using panel data from 2016 to 2020. Employing a Cobb-Douglas production function, the results reveal that both the factors namely labour and capital investments have a positive, and statistically significant impact on the productivity of MSMEs but the effect of capital investment is higher than the labour on the productivity of MSMEs.

However, the existing literature has extensively examined individual components of MSMEs, but several gaps remain. There is a paucity of research in examining the effect of credit on output distinctly for the sub-sectors of MSMEs, notably manufacturing and service enterprises. This paper seeks to address the research gap by delivering an updated empirical analysis that concurrently investigates the influence of credit, labour force, and number of units on the output of the manufacturing and service subsectors, as well as overall MSMEs, thus providing a more comprehensive understanding of the interactions among these variables within the economic environment during the period spanning 2007-08 to 2023-24.

III. Objectives

In this context, the paper aims to study the pattern of credit flow to overall MSME as well as its segments viz manufacturing and service sectors within its framework. Moreover, the impact of credit on output of MSMEs has also been examined along with the effect of credit as well as worker per unit too on output per unit has been assessed separately for manufacturing and service segments as well as for overall MSMEs.
This will shed light on credit dynamics and how the credit availability impacts the output of MSMEs in India.

IV. Hypotheses

As we know, adequate and timely credit would enable firms to invest in fixed assets, purchase raw materials, adopt new technologies, that's why, the Government of India and financial institutions have introduced several targeted schemes to ease the flow of credit to MSMEs. Given the centrality of finance playing a strategic role in MSMEs in driving inclusive growth, it becomes essential to empirically test whether credit availability significantly influences the output performance of MSMEs in India or not. This rationale underpins the hypothesis:
H_{01} : Credit has no impact on the output of the Micro, Small and Medium Enterprises in India.
H_{a1} : Credit has a significant and positive impact on the output of Micro, Small and Medium Enterprises in India.
Since capital and labour are two main sources of output growth in any industry, but because of the non-availability of investment data, we have used credit as proxy variables for the same. And the employment data was estimated using the national statistical yearbook. Using both these variables, we have aimed to assess the impact of credit per unit on the output per unit. In this context, we have hypothesized-
H_{02} : Credit as well as worker per unit has no impact on output per unit in Micro, Small and Medium Enterprises.
H_{a2} : Credit as well as worker per unit has a significant and positive impact on output per unit in Micro, Small and Medium Enterprises.

V. Data & Methodology

In order to test our hypotheses, the data regarding credit to MSMEs was collected from the Handbook of Statistics on the Indian Economy provided by Reserve Bank of India. In which all the credit extended to MSMEs falls under the priority sector advances without any cap. Further, data regarding employment, number of units and output has been acquired from the Statistical Yearbook of India, 2018. Moreover, the data on number of units, employment and output in manufacturing and service sector enterprises was collected from the Fourth All India Census on MSME 2006-07. It is to be noted that the scope of micro-enterprises in the service segment was expanded to encompass specific activities such as retail/wholesale trade establishment, storage and warehousing (excluding cold storage), legal services, and others, with a total of 147.38 lakh units in 2006-07. We have estimated the gross output for these units by multiplying the number of enterprises and output per unit of the service sector.

Gross output includes the value of intermediate goods, so we have converted gross output into gross value added of the MSME. Thus, we have obtained Gross value added by using the GVO-GVA ratio as given in the national accounts statistics on MOSPI.

By using this output data, we have proceeded to test our first hypothesis that is to estimate the impact of credit on the output, by using double-log regression model given by the equation as follows-

$$\ln(Y) = \propto + \beta \ln(X) + e.$$

Where Y means gross value added of MSME and X denotes the credit outstanding to MSMEs.

Moreover, to test our second hypothesis that is to assess the impact of credit as well as labour per unit on the output per unit of MSMEs, we have used the Cobb- Douglas production function given by the following equation as follows-

$$Y = AL^{\propto}K^{\beta}N^{1-\alpha-\beta}$$

On simplifying the aforementioned equation we have,

$$\frac{Y}{N} = \mathrm{A}\left(\frac{K}{N}\right)^{\propto} * (\frac{L}{N})^{\beta}$$

Taking natural log of the equation on both sides, we get

$$\ln\frac{Y}{N} = A + \propto \ln\left(\frac{K}{N}\right) + \beta \ln\left(\frac{L}{N}\right)$$

where $\frac{Y}{N}$ is the output per unit in the MSMEs, A is the efficiency parameter, $\frac{L}{N}$ is labour per unit, $\frac{K}{N}$ is credit per unit. 'α' and β are the output elasticity that indicates the percentage change in output per unit resulting from a one-unit change in labour as well as credit per unit.

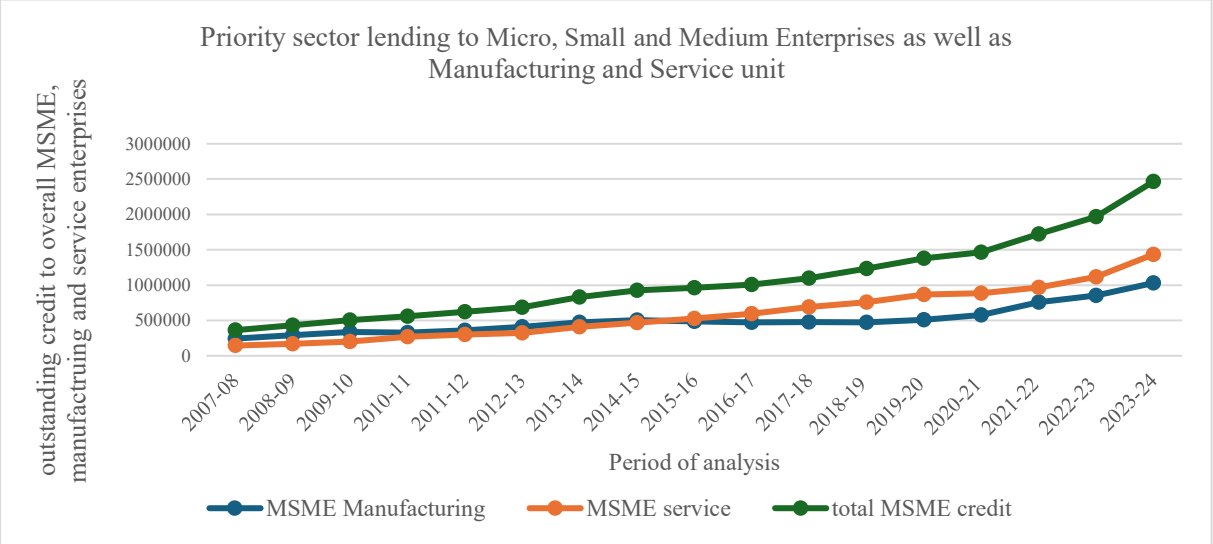
In addition to this, we have used simple graphical and tabular methods to analyse the pattern in credit flows to the total MSMEs as well as for both the segments of MSMEs viz manufacturing and service sectors individually.

VI. Analysis

VI.1 Pattern of credit flow to MSMEs in India

It is in place to mention that entire credit granted to MSME segment comes under the priority sector advances, according to the guidelines of the Reserve Bank of India. Based on the data provided by the Reserve bank of India, the patterns of credit flow to manufacturing and service units and to overall MSMEs under the priority sector has been examined for the period of analysis. Credit availed by overall MSMEs as well as manufacturing and service subsectors is shown in Figure 1;

Figure 1



Source: Handbook of Statistics of Indian Economy, Reserve Bank of India

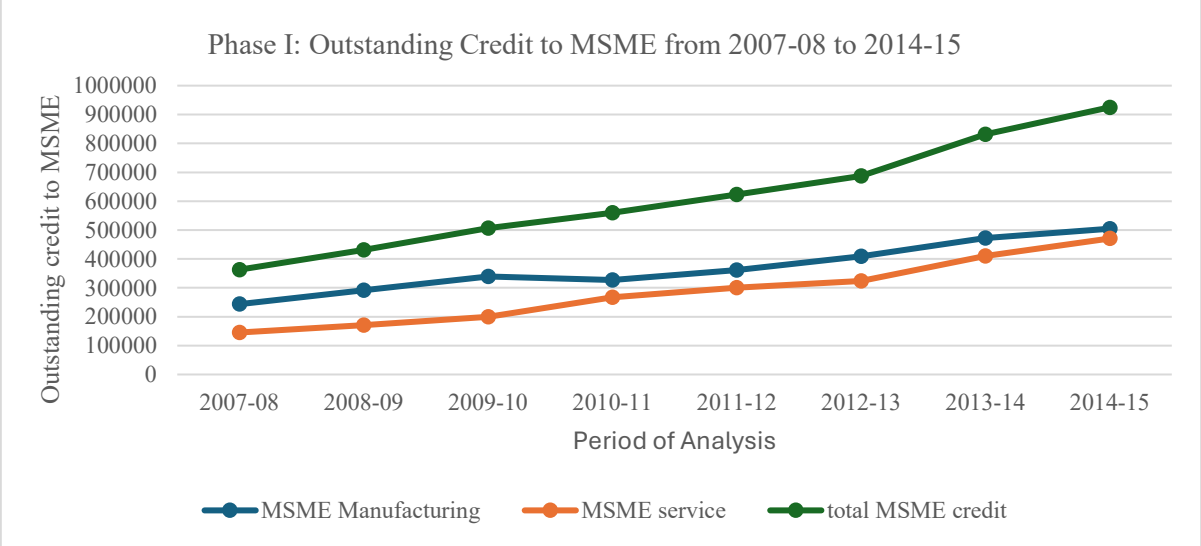
Based on the pattern of the institutional credit to MSMEs, manufacturing and service sectors, the whole period of analysis has been characterised by two phases because in 2015-16 the amount of outstanding credit to service enterprise exceeded to that of the manufacturing enterprise. The two phases for outstanding credit provided to manufacturing and service enterprises in MSME are as follows–

Phase I – 2007-08 to 2014-15

Phase II – 2015-16 to 2023-24

In the phase I, it is evident that manufacturing enterprises accounted for greater share in the total credit deployed to the MSME sector in comparison to the credit disbursement to service units, refer figure 2 which is part of figure 1 that has been segregated to show the particular portion separately.

Figure 2



Source: Handbook of Statistics of Indian Economy, Reserve Bank of India

One of the plausible reasons behind the greater credit exposure in manufacturing units in comparison to that in service sector can be attributed to the significantly large difference between the investment limits set for manufacturing and service enterprises in the MSMED Act, 2006-07 (refer table 1), and this disparity in investment limits is due to the difference in productivity levels of manufacturing and service enterprises, as demonstrated by table 2.

Table 1
Investment in plant & machinery and equipment in Manufacturing and service enterprises in MSME framework

Enterprises	Manufacturing Enterprises	Service Enterprises
Micro enterprises	Up to Rupees 25 lakhs	Up to Rupees 10 lakhs
Small Enterprises	More than Rupees 25 lakh and less than Rupees5 crores	More than Rupees 10 lakhs and less than Rupees 2 crores
Medium Enterprises	More than Rupees 5 crores and less than Rupees 10 crores	More than Rupees 2 crores and less than Rupees 5 crores

Source: Annual Report of Micro, Small and Medium Enterprises, 2007-08

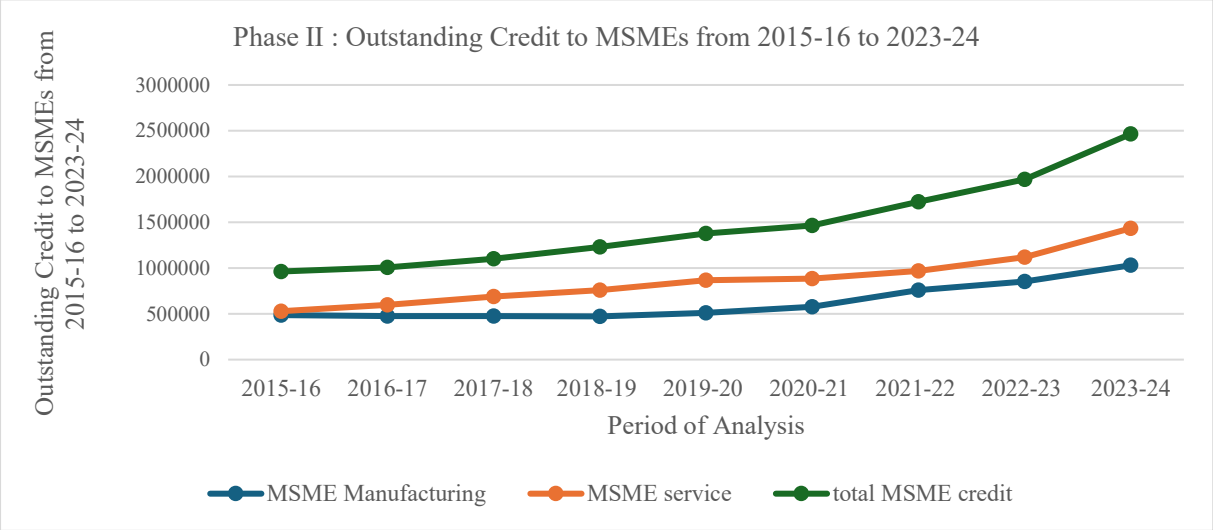
It can be observed from the table 2 that, output per unit for manufacturing enterprises is greater than the service enterprises. That's why, the investment limit was kept higher for manufacturing enterprises, consequently it also signifies that larger size of loan is needed for investing in a plant and machinery in manufacturing units in comparison to investment in an equipment in the service units.

Table 2
Output per enterprise in manufacturing and service enterprises within MSMEs

Year	Output per manufacturing enterprise	Output per service enterprises
2007-08	231667.666	109507.664
2008-09	249647.943	132475.958
2009-10	276747.711	149512.956
2010-11	303932.605	175178.343
2011-12	325359.5886	199448.3472
2012-13	343110.4601	224144.1588
2013-14	366500.461	246185.1049
2014-15	379165.2498	255438.0456

Source: Author's estimation based on the 4th All India Census of MSME, 2006-07 and Statical Yearbook 2018

Figure 3



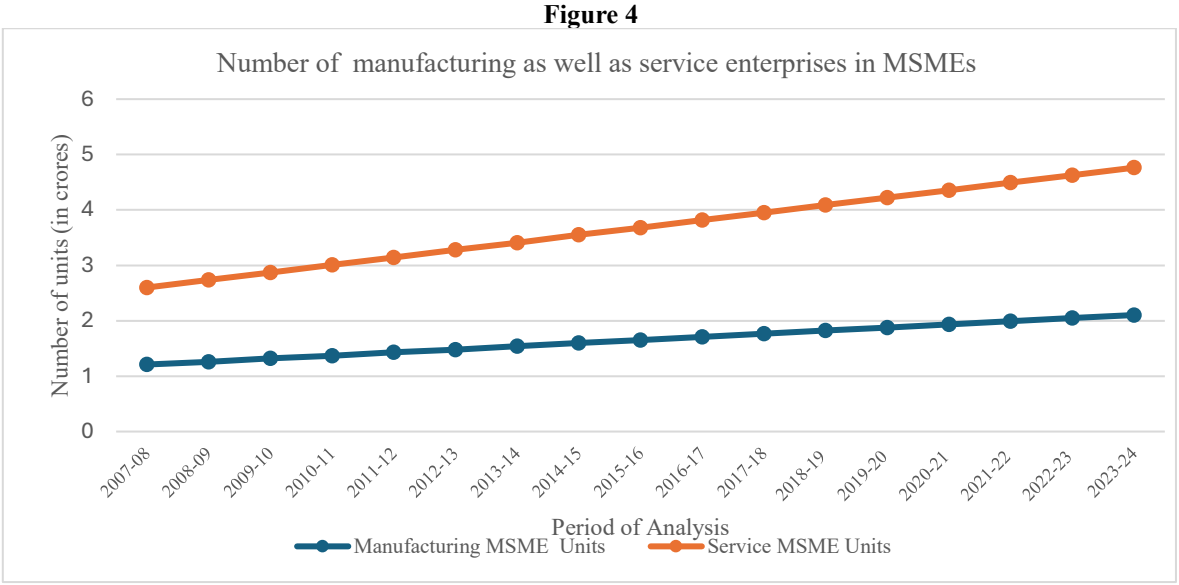
Source: Handbook of Statistics of Indian Economy, Reserve Bank of India

In Phase II, the service sector accounts for greater share in total credit extended to the MSMEs (refer figure 3 which is part of figure 1 segregated to show the portion as phase II separately). On the other hand, the bank lending to the manufacturing sector had declined but gradually restored in 2020-21. The shrink in credit disbursals to manufacturing sector in MSMEs was significantly noticeable around 2015-16 to 2019-20.

An important rationale for this this shift in the outstanding credit towards service segment is due to the government policies which has made it mandatory for the banks to maintain 20% annual growth in credit to MSEs of which 60% is reserved for micro enterprises only, out of the total advances to MSEs. Since service segment is

dominated by micro enterprises (refer figure 4) hence, overall outstanding credit flow moved in favour of the service segment. Though this policy was introduced in 2010, but its impact in raising outstanding credit for service enterprises above manufacturing enterprises could be witnessed since 2015-16 (refer figure 3).

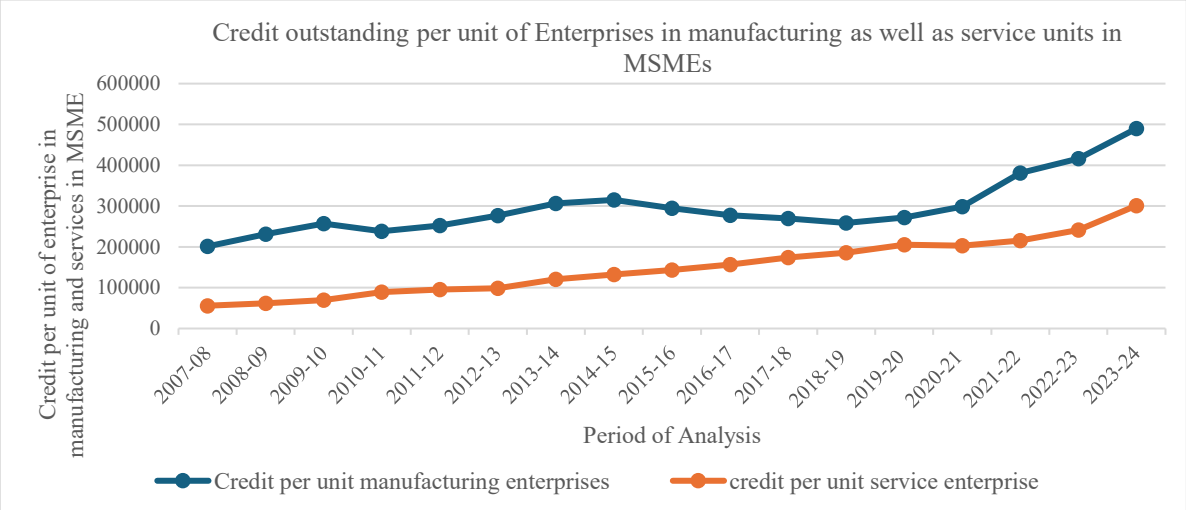
Figure 4



Source: Author's estimation based on the 4th All India Census of MSME, 2006-07 and National Statistical Yearbook 2018

Though, at the aggregate level, credit outstanding to service enterprises 2015-16 is higher than that of manufacturing entities but at credit per unit level, lending to the manufacturing units remained significantly higher than in the service sector during the period of analysis on the account of the disproportionately larger number of units in service enterprises than in manufacturing (refer figure 4). Due to this fact, it can be inferred that MSMEs engaged in the service sector experiences higher influx of credit on the account of the huge size of the sector in terms of the number of units as they require credit mostly as working capital. Thus, this shows manufacturing and service sector enterprises have distinct characteristics hence, credit requirements also differ accordingly.

Figure 5



Source: Author's estimation based on the 4th All India Census of MSME, 2006-07 and National Statistical Yearbook 2018

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Since, a steady and structured credit flow supports MSME growth. Therefore, analysing patterns in credit flow helps in understanding how effectively credit translates into output level from 2007-08 to 2023-24. The subsequent section explores how credit outstanding impacts the output of the Micro, Small and Medium Enterprises during the period of analysis.

VI.2 Impact of credit outstanding on output in the MSMEs

The growth of the enterprises depends not only on the internal funds of the units but much more depends on the availability of credit expressed in terms of amount of loan granted to different enterprises by the banking sector. As amount of loan granted to different units tend to increase overtime so, the most appropriate parameter to measure the impact of credit on output is the amount of loan outstanding in name of different units under Micro, Small and Medium Enterprises sector. It is in this context we have analysed the impact of credit outstanding on output for overall MSMEs in India by considering double log linear regression model. The estimated regression equation for the same is as follows-

$$\ln (Y) = 0.122 + 1.094 * \ln (K)$$
$$(0.273) \quad (31.743)$$
$$(0.789) \quad (0.000)$$

$R^2 = 0.982$

figures in parentheses indicate t values for parameters and below it are respective p values.

The estimated regression equation between credit outstanding and output for overall MSME sector shows significant impact of credit on output and it is evident from the equation that 1% increase in credit to MSME units tends to increase overall output by 1.1 %. Moreover, it has been verified that estimated relationship is not spurious in value as suggested by the Stigler & Sherwin (1985). They suggested that if there are causal relationship in the variable then there exists a significant correlation not only at levels but at the first differences. The value of correlation coefficient at first difference of the credit outstanding and total output is 0.708% which is significant at 5% probability level. Thus, our regression clearly demonstrates a significant impact of credit outstanding on the level of output. Further, we have also analysed whether the significant relation in credit outstanding and output level also exists individually for the manufacturing and service sector in MSMEs. For this we have again estimated regression equation between outstanding credit and output level for manufacturing and service sectors separately. This will also facilitate to show whether the effect is more prominent in manufacturing or service sector enterprise. The estimated regression equation for manufacturing and service enterprises is as follows-

For manufacturing enterprises, the estimated equation is:

$$\ln (Y) = -3.935 + 1.330 * \ln (K)$$
$$(-2.933) \quad (12.959)$$
$$(0.010) \quad (0.000)$$

$R^2 = 0.918$

For service enterprises, the estimated regression equation is :

$$\ln (Y) = 2.240 + 0.883 * \ln (K)$$
$$(6.840) \quad (35.349)$$
$$(0.000) \quad (0.000)$$

$R^2 = 0.988$

figures in parentheses indicate t values for parameters and below it are respective p values

The estimated regression equations between credit outstanding and output for manufacturing and service sectors in MSME shows the positive and significant relationship as indicated by the coefficients associated with manufacturing enterprises is $\beta_m = 1.330$ and coefficient for service enterprises $\beta s = 0.883$ suggesting that with 1% increase in the credit to both sectors in MSMEs, there will be 1.330% rise in manufacturing output and 0.833% increase in service output. However, the strength of this relationship is relatively weaker in the service sector compared to the manufacturing sector, as reflected by the lower value of beta coefficient associated with service sector. This suggests that though credit expansion contributes to output growth in services, its impact is more pronounced in the manufacturing segment. Hence, on this account, we reject the null hypothesis and accept the alternate hypothesis that credit outstanding has a significant impact on output level of MSMEs at 1% level of significance.

Thus, our analysis clearly demonstrate that credit expansion has significant effect on output at the overall level as well as at manufacturing and service sector individually but whether credit outstanding per unit of enterprise too have a significant impact on the output per unit of enterprises or not. We have conducted a separate regression analysis in the subsequent section. Where, we have also added another independent variable namely worker per unit. Since, in economic theory output is not only dependent on credit but also on the work force. This gives us more comprehensive view of the impact of major factors on productivity of Micro, Small and Medium Enterprises.

VI.3 Impact of credit outstanding as well as labour intensity on the productivity of MSMEs in India

As described earlier that output expansion is determined not just by outstanding credit, but also by the number of workers and units. Hence in order to assess the combined effect of outstanding credit, number of units, and number of workers on productivity of MSMEs we have used the Cobb- Douglas production function as follows-

$$(\frac{Y}{N}) = A\,(\frac{K}{N})^{\alpha} * (\frac{L}{N})^{\beta}$$

Where,

$\frac{Y}{N}$ = output per unit of enterprises in MSMEs,

$\frac{K}{N}$ = credit outstanding per unit in MSMEs,

$\frac{L}{N}$ = worker per unit in MSMEs,

The equation allows us to demonstrate if credit outstanding and labour employed per unit significantly affects the output per unit. The estimated relationship between credit per unit and worker per unit on output per unit is as follows –

$$\ln(\frac{Y}{N}) = 0.242 + 0.939 * \ln(\frac{K}{N}) + 1.368 * \ln(\frac{L}{N})$$

(0.273) (6.428) (1.147)

(0.789) (0.000) (0.271)

$R^2 = 0.980$

figures in parentheses indicate t values for parameters and below it are the respective p values

The value of R^2 shows that variation in output per unit is significantly explained by the variations in credit outstanding per unit and the main source of variability in output per unit is credit outstanding per unit. This is evident by the fact that the coefficient associated with the credit per unit has a major impact as it is significant at less than 5% probability level and value of coefficient associated with credit per unit is 0.939, which shows that on average 1% improvement in credit per unit causes 0.939% enhancement in output per unit. Furthermore, the effect of workers per unit on output per unit is not statistically significant at the 5% probability level, suggesting that labour is not the major factor of production as the classicals used to assume, rather in this age of mechanisation, capital per unit plays more important role as indicated by the proxy variable namely credit per unit in our analysis. Furthermore, we have investigated whether the substantial relationship between outstanding credit per unit, worker per unit, and output per unit exists separately for the manufacturing and service sectors in MSMEs. We have estimated regression equation between these variables for both the subsectors separately. This will also help to indicate whether the influence is more pronounced in manufacturing or service sector enterprises. The estimated regression equation for manufacturing is units as follows-

$$\ln(\frac{Y}{N}) = -4.231 + 1.452 * \ln(\frac{K}{N}) - 1.045 * \ln(\frac{L}{N})$$

(-1.656) (6.382) (-0.774)

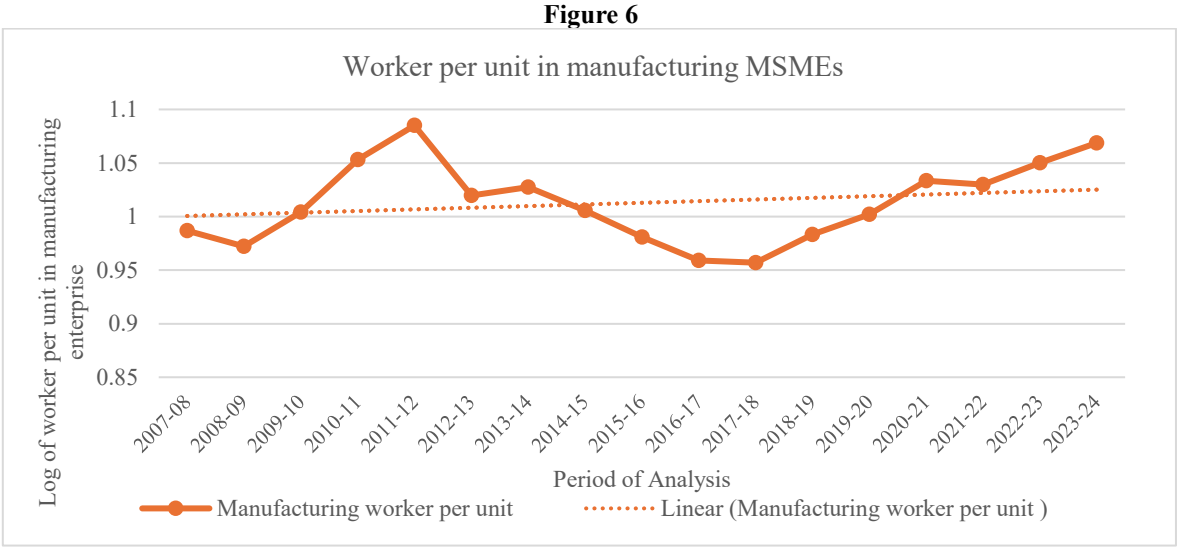
(0.120) (0.000) (0.452)

$R^2 = 0.658$

figures in parentheses indicate t values for parameters and below it are the respective p values

The estimated regression equation between credit outstanding per unit of enterprises, workers per unit and output per unit for manufacturing sector in MSME shows statistically significant impact of credit per unit on output per unit as indicated by the t value of the coefficient associated by credit per unit. Further the coefficient associated with the credit per unit with is 1.452 that means a 1% increase in credit per enterprise leads to a 1.452% increase in output per enterprise. Thus, credit outstanding strongly enhances productivity of enterprise. On the other hand, worker per enterprise does not significantly affect output as the coefficient associated with worker per unit is not significant, rather it is negative which indicates that labour intensity has not increased consistently overtime with productivity. There is an uneven increase in worker per unit from 2009-10 to 2011-12 shown in the figure 6 –

Figure 6



Source: *Author's estimation based on Fourth All India Census of MSME, 2006-07 and Statistical Yearbook 2018*

From figure 6 it is also evident that the worker per unit has declined for a substantial period of analysis due to which there is an insignificant and negative relationship with output per unit. This indicates the productivity in manufacturing sector depends much more on mechanisation rather than labour-oriented process of production. Thus, the model highlights that supply of credit plays a stronger role in driving productivity in MSME units engaged in the manufacturing activities.

Further, we have also assessed the relation in credit as well as labour per unit on output per unit in service sector, the estimated regression equation for service enterprise is as follows-

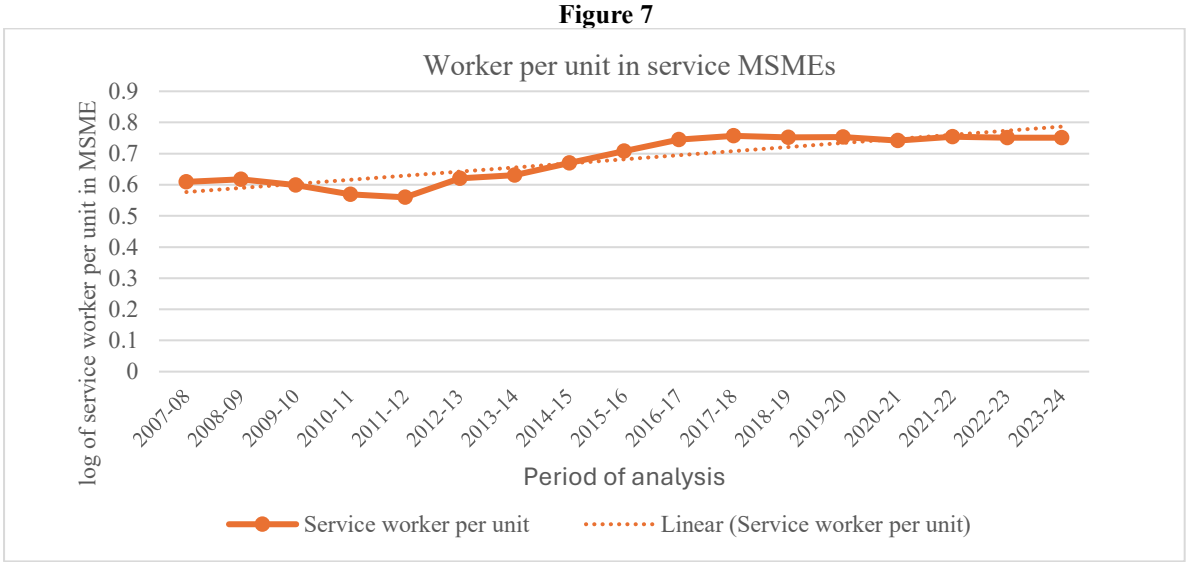
$$\ln\left(\frac{Y}{N}\right) = 2.018 + 0.900 * \ln\left(\frac{K}{N}\right) - 0.169 * \ln\left(\frac{L}{N}\right)$$
$$(4.007) \quad (14.488) \qquad (-0.418)$$
$$(0.001) \quad (0.000) \qquad (0.682)$$

$R^2 = 0.985$

figures in parentheses indicate t values for parameters and below it are respective p values

The estimated equation shows that credit outstanding per unit of enterprises, workers per unit and output per unit for service sector shows significant impact on output per unit indicated by t values of the coefficient which is statistically significant at less than 5% probability level. the coefficient associated by credit per unit is 0.9 that means that output per unit in MSMEs is strongly responsive to credit outstanding. A 1% rise in credit per unit raises output per unit by about 0.9 %. On the other hand, the coefficient of workers per unit is negative (-0.169) and statistically insignificant. Which is again due to uneven growth in number of the workers engaged in the service sector enterprise as shown in the figure 7.

Figure 7



Source: Author's Estimation based on Fourth All India Census of MSME,2006-07 and Statistical Yearbook 2018

From the figure 7, it is evident that worker per unit declined during the initial years of analysis from year 2009-10 to 2011-12, thereafter it gradually increased until 2017-18. But worker per unit has again shown a declining trend in recent years. This uneven fall and rise in labour intensity contributed to negative sign to the coefficient associated with worker per unit. Due to this reason, the null hypothesis holds in the case of worker per unit. Thus, our analysis has clearly demonstrated that the primary driver of productivity in both manufacturing and service as well as overall enterprises is credit outstanding per unit and that is why in this case, we reject the null hypothesis and accept the alternate hypothesis at 1% probability level. However, credit outstanding per unit has a much stronger impact on productivity of manufacturing enterprises than on service sector enterprises. This disparity in the impact of credit per unit on different segments of MSMEs demonstrates greater requirement of credit for manufacturing units than service sector hence, the introduction of the composite definition of MSMEs regarding the manufacturing and service sector enterprises in 2020 cannot be considered a correct step. Credit requirements for manufacturing and service enterprises are different. Hence, there is strong necessity that investment limit for manufacturing and service sector enterprises should be distinct as existed prior to 2020. Accordingly, investment limits should also be enhanced separately for manufacturing and service sector enterprises, rather than uniformly as implemented since 2020. In addition to uniform investment limit for manufacturing and service sector enterprises since 2020, government of India has also raised the investment limit since 2025 for Micro, Small and Medium Enterprises in constant proportion to the existing level of investment limit since 2020. However, considering the fact that with increasing mechanization of especially Small and Medium Enterprise it is necessary that there should be increase in investment limit in rising proportion as one move from micro to small and small to medium enterprises. Finally, access to Emergency Credit Line Guarantee Scheme for micro and small enterprises should be continued especially in wake of global uncertainty and increased tariffs imposed by united states on India which is against the spirit of WTO.

VII. Policy recommendations

Our analysis of the impact of credit per unit as well as worker per unit on output per unit for manufacturing and service sector separately as well as for overall MSME sector has facilitated in outlining certain interesting policy implication which are as follows -

One of the major policy changes in recent past is to enhance the investment limit of micro enterprises from 1 crore to 2.5 crores, as a result, the central bank should increase the target lending of 7.5% of adjusted net bank credit to 10%. Our recommendation is not the arbitrary rather, it stems from the fact that overall credit as well as credit per unit has a significant impact on overall output as well as output per unit.

Moreover, impact of credit on output has been more dominating for manufacturing units than in service sector enterprises. Therefore, the government should not have abolished the distinction regarding investment limits in manufacturing and service units.

Furthermore, credit flows have an important bearing on output, but it has been noticed especially during the past few years that certain exogenous factors in the form of Covid-19 pandemic and high tariffs introduced by the United States are deteriorating the viability of the enterprises. Hence, Emergency Credit Line Guarantee Scheme should be allowed to continue.

VIII. Conclusion

In this paper we have analysed the patterns of credit flow to MSMEs spanning 2007-08 to 2023-24, estimated the impact of credit on the level of output and assessed the effect of credit as well as labour per unit on the productivity of MSMEs across the manufacturing and service enterprises within the MSME framework. Our analysis of the pattern of credit flow to MSMEs spanning 2007-08 to 2023-24 revealed that it has expanded unevenly across both categories of enterprises in the MSME sector, that initially outstanding credit has been higher in the manufacturing sector until 2014-15. Subsequently, the outstanding credit to the service sector significantly surpassed that of the manufacturing sector. An important rationale for this shift in the outstanding credit towards service segment is due to the government policies which has made it mandatory for the banks to maintain 20% annual growth in credit to MSEs of which 60% is reserved for micro enterprises only, out of the total advances to MSEs. Since service segment is dominated by micro enterprises hence overall outstanding credit flow moved in favour of the service segment. Though these policies introduced in 2010, but its impact in raising outstanding credit for service enterprises above manufacturing enterprises could be witnessed since 2015-16. The gradual increase in flow of credit to manufacturing as well as service sector has a significant and positive impact on output of both types of enterprises with greater impact on output in case of manufacturing sector enterprises than in case of service sector enterprises. Despite the fact that credit flow to manufacturing enterprises had slowed down since 2015-16. Yet its impact on output in manufacturing enterprises is more dominating than that of service sector enterprises because of significantly larger number of MSMEs units falls in the category of service sector than in manufacturing sector. This is especially due to the fact that number of entities in the manufacturing sector is just 30% of the total MSMEs units.

However, credit per unit has remained higher in the manufacturing enterprises than in the service enterprises. Our observation is empirically supported by the estimated regression of the output per unit and credit per unit of enterprises for manufacturing and service sector separately, where credit per unit exercises more prominent and significant impact on output per unit in case of manufacturing sector enterprise.

We found that credit as well as credit per unit has a more substantial effect on output as well as output per unit in manufacturing MSMEs compared to that in service sector. Which implies that increasing mechanisation has made credit as prominent determinant in increasing the productivity of overall MSMEs, but more pronounced effect has been observed especially in manufacturing sector. Therefore, it is imperative on the part of the government to re- introduce the distinction in the investment limits for the manufacturing and service enterprises owing to the distinct characteristics of the sector. Moreover, considering the increasing mechanisation in small and medium-sized units, it is also important to maintain the distinction in the investment limits that has existed prior to 2020, while raising the investment limit for Micro, Small and Medium Enterprises for both manufacturing and service sector entities.

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IX. Appendix

Table IX 1

Credit Flow to Micro, Small and Medium Enterprise in India			
Year	**Credit to Manufacturing enterprises in MSMEs**	**Credit to service enterprises in MSMEs**	**Credit to the total MSME sector**
2007-08	243498	145347.3	362871
2008-09	291152	170334.4	431350
2009-10	339037	200150.2	506167
2010-11	326693	267516.6	559335
2011-12	361446	301024	623415
2012-13	409052	323360	686999
2013-14	472263	410238	831881
2014-15	504564	470711	924878
2015-16	486288	528823	962408
2016-17	474537	597284	1006778
2017-18	476679	688516	1100045
2018-19	472160	759910	1232070
2019-20	511624	866008	1377632
2020-21	578401	886064	1464465
2021-22	758064	967429	1725493
2022-23	851774	1117717	1969491
2023-24	1030313	1434580	2464893

Source: Handbook of Statistics on Indian Economy, Reserve Bank of India

Table IX 2

GROSS VALUE ADDED in MSME SECTOR			
YEAR	**GVA in service enterprise**	**GVA in Manufacturing Enterprise**	**Total GVA in MSME**
2007-08	300051	291901	591952
2008-09	380206	329535	709741
2009-10	450034	379144	829178
2010-11	550060	434624	984684
2011-12	654191	481532	1135723
2012-13	764332	528390	1292722
2013-14	873957	586401	1460358
2014-15	995212	625623	1620835
2015-16	1170902	619442	1790344
2016-17	1259395	741522	2000917
2017-18	1399152	822554	2221705
2018-19	1474769	982187	2456957
2019-20	1635215	978252	2613467
2020-21	1616176	964856	2581032
2021-22	1801465	1266196	3067662
2022-23	2022364	1481090	3503454
2023-24	2219523	1753615	3973138

Source: Annual Report of Micro, Small and Medium Enterprises, 2013-14
Ministry of Micro, Small and Medium Enterprises

Author's estimation by using data from national Accounts Statistics from MOSPI, India

Table IX 3

Employment in Micro, Small and Medium Enterprises in India			
Year	**Employment in manufacturing enterprises**	**Employment in service enterprises**	**Total Employment in MSMEs**
2007-08	3.38	5.04	8.42
2008-09	3.49	5.32	8.81
2009-10	3.74	5.48	9.22
2010-11	4.1	5.55	9.65
2011-12	4.38	5.74	10.12
2012-13	4.27	6.34	10.61
2013-14	4.47	6.67	11.14
2014-15	4.51	7.19	11.7
2015-16	4.56	7.75	12.31
2016-17	4.61	8.33	12.94
2017-18	4.75	8.72	13.462
2018-19	5.02	8.96	13.984
2019-20	5.27	9.26	14.526
2020-21	5.60	9.43	15.028
2021-22	5.73	9.84	15.57
2022-23	6.01	10.09	16.102
2023-24	6.29	10.37	16.654

Source: *National Statistical Yearbook India, 2018*

Author's estimation based on the data given in the Fourth All India Census of Micro, Small and Medium Enterprises, 2006-07

Table IX 4

Number of Units of MSME in India			
Year	**Number of units in Manufacturing enterprises**	**Number of units in Service Enterprises**	**Total number of Enterprises**
2007-08	1.26	2.74	4
2008-09	1.32	2.87	4.19
2009-10	1.37	3.01	4.38
2010-11	1.43	3.14	4.57
2011-12	1.48	3.28	4.76
2012-13	1.54	3.41	4.95
2013-14	1.6	3.55	5.15
2014-15	1.65	3.68	5.33
2015-16	1.71	3.82	5.53
2016-17	1.767	3.953	5.72
2017-18	1.823	4.088	5.911
2018-19	1.879	4.223	6.102
2019-20	1.935	4.358	6.293
2020-21	1.991	4.493	6.484
2021-22	2.047	4.628	6.675

2022-23	2.103	4.763	6.866
2023-24	2.159	4.898	7.057

Source: *National Statistical Yearbook India, 2018*
Author's estimation based on the data given in the Fourth All India Census of Micro, Small and Medium Enterprises, 2006-07