



**ECONOMIC AND OPERATIONAL IMPACT OF THE COVID-19
PANDEMIC ON SMALL-SCALE INDUSTRIES IN NAGPUR
DISTRICT: AN EMPIRICAL ASSESSMENT**

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Abstract

The COVID-19 outbreak left small-scale industries, which make up an important part of the industrial development of the region in India, with unprecedented economic and operational problems. This research paper empirically investigates the economic and operational effects of pandemic on small scale industries in Nagpur District. Based on the primary data collected, consisting of 150 small-scale industrial units using a structured questionnaire, the study examines change in key performance indicators which include revenue, employment, liquidity position, and capacity utilisation in the pre-pandemic, pandemic and post-pandemic periods. The results show that revenues and employment levels dropped statistically significantly and that the supply chains, labour, logistics, and payment cycles have plummeted into extreme operational interruptions during the pandemic. Even though the post-pandemic phase is characterised by partial recovery, most of the firms still work below the pre-PANDEMIC levels which points to the structural and financial limitations. Adaptive measures like adoption of digital, operational changes, and diversification of suppliers in facilitating recovery are also mentioned as important aspects in the study. The article adds empirical district-level data to the existing set of literature regarding MSME resilience, as well as to the policy-relevant information on designing the specific interventions that will increase the resilience and shock-absorption capacity of the small-scale industries in the post-pandemic setting.

Keywords: Pandemic, small-scale industries, economic impact, operational disruption, MSMEs, Nagpur District, post-pandemic recovery

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I. INTRODUCTION

The small-scale industries (SSI) which are often collectively called MSME will take a middle but largely not highlighted role in the economy of the districts in India. Such businesses maintain a livelihood, decentralized forms of production and also connect the local markets and regional demand systems. The pandemic left quite a disruption in this segment, not only by slowing the economic

activity but by revealing weak grounds under which most of the small firms were based on. Poor liquidity, excessive reliance on unbroken access to the market with continuous connectivity, weak bargaining power in the supply networks, and the use of informal labour institutions predisposed SSIs to deep shocks in particular. With movement limits and uncertainty cutting down consumption, numerous businesses saw their streams of

revenue crudely cut, causing operations grounds, workforce cuts, wage rationalization, and extreme squashing of everyday firm expenditures.

he level of disruption was rather different among the firms and it showed variation based on the scale, exposure to the sector and the preparations to the crisis. Small and very small businesses, with low financial cushioning at times, were the ones who were disproportionately hit as compared to large MSMEs that have comparably greater access to finance and institutional backup. Companies whose operations are highly geographically local or rely on frequent logistical arrangements were put under permanent operational pressure, particularly in cases where input delivery channels and transport services would be unreliable. In the long-term perspective, the crisis altered the priorities of the managers. The survival more and more relied on the adaptation abilities that included finding other sources of inputs, gaining better control over stocks and cash flows as well as restructuring the production and service operations. Digital practices that were once a fringe of many firms were taken into more serious consideration as a way of engaging the customers, processing transactions, and providing simple business coordination.

Nagpur District provides a valuable context to analyze these changes because of the presence of Nagpur District which is a commercial and logistical crossroad in the Vidarbha region. The district is where small manufacturing plants, traders, and service institutions are located in a hundred thousand and they are closely tied to local sources and procurement systems, as well as regional consumption habits. The impacts of the pandemic in this ecosystem took place in a number of mechanisms that are mutually related. The disruption in supply limited access to raw materials and intermediate products, and labour shortage became a problem as mobility was limited by the restriction of returning

migration and workforce was lower than it was before. The situation with demand conditions continued to be very volatile because households delayed or cut back non-essential expenditure due to uncertainty in income. The situation was exacerbated by financial pressure since late payments by the buyers were accompanied by prudent lending by the banks, NBFCs, and informal financiers. This, as a result, initiated a compound crisis on the enterprises that impacted a combination of economic outcome, i.e. income, liquidity, and employment, as well as operational performance, i.e. capacity utilization, reliability of delivery, and the ability to continue production and services.

However, there is still limited detailed evidence on the role of MSMEs in the district level, despite the increasing amount of studies on the subject of pandemics and MSMEs in India. More specifically, research papers that conditionally analyze financial stress and operational disruption within a single analysis framework are few in number. This gap will be filled by the current study which will help to record the magnitude, nature, and period of disruption brought about by SSIs in a definite local state. Such insights are practical implications of policy design because it can be based on current evidence which indicates that support measures to MSMEs are maximally effective when designed in a way that makes them sensitive to local factors, firm-level constraints, and adaptability differences among enterprises.

II. LITERATURE REVIEW

One of the consistently repeated findings in studies conducted on the topic of firm behaviour based on the pandemic is that small businesses experienced an overlapping of shocks and not individual disruptions. The falls in demand, disruption of supply chains, and the restriction of financial resources all manifested at the same time and subjected small companies to extraordinary pressure. Macro-level scenario analyses in the Indian

environment explored predicted acute shortages of activity in the manufacturing and trading sector and MSMEs were labeled as especially vulnerable to effective lockdown under longer or more frequent lockdowns, specifically through their decreased capacity utilization and suppressed cash flow patterns (Dev & Sengupta, 2020; Mahajan and Tomar, 2021). Micro level survey (firm based surveys) supports these results by recording severe operational pressure during peak restriction periods. Primary data evidence shows that the economic activity of production has declined significantly, labour is retained even with little output, and business survival margins are too narrow, which explains that the threat of operational closure was directly related to liquidity constraints in the short term and fixed cash liabilities (Bartik et al., 2020; Jain et al., 2022).

The other literature trend focuses on the effectiveness of the containment and the reaction of the firm concerning the situation of increased uncertainty. Indian MSMEs continue to show surveys that are widespread in terms of the decreasing sales turnover and profitability during the pandemic (Ghosh et al., 2021). The firms reacted with a set of adaptive responses such as the temporary shutdown of the operations, decreased wages, and temporary layoffs. These dynamics imply that the results of operations became not merely a mechanical consequence of the external limitations, but they were affected by the managerial judgment in the circumstances of crisis. Time and time again, the companies had to juggle between the short-term demands of survival and long-term requirements, namely the ability to retain talent among its workforce, sustain customer relationships, and preservation of supplier connections (Kumar & Ayedee, 2021).

Another stream of literature shows that the effects of pandemics are not evenly distributed throughout firms and industries. The relative findings of the Asian economy, such as India,

indicate that the magnitude of activity, sectoral exposure, and pre-emption location contributed extensively to the level of disruption (Apedo-Amah et al., 2020). Despite the beginning of aggregate indicators improvement, a significant share of the companies were still facing temporary shutdowns, liquidity constraints, and inconsistent operational conditions (World Bank, 2021). Such heterogeneity creates a good justification of the analysis at the district level because local industrial structures and supply-chain arrangements may form on both the exposure to shocks and recovery patterns. Within the small-scale industries deeply integrated into regional logistics systems and operating across a mixture of urban and peri-urban markets (like Nagpur), subsectors and market focus as well as levels of formality are probably different across districts.

The supply-chain disruption literature contributes to the enhanced insight of MSME vulnerability during the pandemic. In the case of small companies, the diminished demand did not serve as the only disruption but was accompanied by disrupted supply of inputs, transportation issues, reduced product lines, and drop in buyer dependability (Ivanov, 2020). In empirical investigations that associate supply-chain instability with the firm performance, the beneficial effects of maintaining the supply chain through the introduction of resilience-related practices, including supplier diversification and operational flexibility, have been pointed out as fundamental performance abilities, other than discretionary strategies (Queiroz et al., 2022). In the operational sense, these disruptions can be seen to have visible impacts in production lead times, rates of fulfilling orders, the use of capacity, and the working-capital-turnover dimension which is frequently neglected in the analysis of financial measures only.

Adoption of digital has also been an important point of focus with respect to continuity and

recovery but the data indicate ambivalent results. Research in the growing economies of Asia records a fast growth in online interaction with the MSMEs and the desire to expand digital sales channels throughout the pandemic (Zhu et al., 2021). Nevertheless, the changes in the performance, caused by the digitalization in the short run, are not consistently noticeable, which speaks to the adjustment costs, reliance to the platform, and disproportionate digital preparedness (Liguori and Pittz, 2020). Similar Indian literature describes digital tools as a way of providing access to customers and continuing to make payments in the case of mobility limits, although the effectiveness of a solution in this case depends on the presence of previous abilities over skills, infrastructure, and finances (Sahoo and Ashwani, 2020). In this way, digitalization does not present itself as an even-handed solution at all, but rather as a conditional parameter that moderates the reaction of firms to the crisis state.

Lastly, the policy-based literature suggests a necessity of having a differentiated and context-sensitive intervention to respond to the challenges of MSME distress in the pandemic. These journals report a range of issues related to MSME, such as liquidity constraints, labour unrest, compliance costs, and limited market access (Eggers, 2020). The recovery is conceived as a two-step procedure to include of short-term relief actions and the development of abilities in the long run. To conduct empirical investigation on a district level, such a view suggests that multiple dimensions of analysis are significant, i. e. economic outcomes, revenue loss, employment effects, and indebtedness; operational outcomes, i. e. capacity utilization, input constraints, and adaptive responses, i. e. digital adoption, supplier reconfiguration, and product mix changes, should be incorporated to further enhance the connection between the evidence on the firm level and the actionable

policy and managerial implications (OECD, 2021).

Objectives of the Study

The main goal of the research is the theoretical investigation of economic and operational effects related to the PANDEMIC-19 pandemic on the small-scale industries in Nagpur District by evaluating the alterations in revenue, labour, cost systems, liquidity, and utilisation of the capacity. The paper also seeks to examine the level of operational interruption in relation to supply-chain resiliency, input availability, labour stability and order completion; and also to determine the adaptive mechanisms taken up by small-scale industrial businesses - including digitalisation, supplier diversification and production process changes - throughout and post-pandemic. The paper is also aimed at finding the decisive firm-specific and industry elements that substantiate resilience and recovery and gaining insights that are applicable to policy to facilitate a specific Asian intervention to enhance sustainability and competitiveness of small-scale industries in the post-pandemic reality.

Methodology

The research design will be descriptive and analytical research design due to the use of primary and secondary data to empirically determine the economic and operational effects that the PANDEMIC-19 pandemic has on small-scale industries within the Nagpur District. The primary data were obtained using a structured questionnaire or a sample size of 150 small-scale industrial units sampled using stratified random sampling to get an adequate coverage in terms of manufacturing, trading, and service subsectors. The pre-pandemic, pandemic and post-pandemic questions defined by the questionnaire included trends in revenue, employment rates, cost systems, liquidity status, capacity utilisation, supply-chain dysfunctions, and the adaptive strategies like the adoption of digital technology and process changes. Published journal articles, government reports, and MSME databases

were used as secondary sources of data to allow providing contextual and comparative information. The data collected was analysed in terms of descriptive statistics and inferential statistics; such as paired t-tests and chi-square tests in order to test the difference in economic and operational indicators between periods and test the results at the level of 5 per cent to come up with valid empirical conclusions.

III. RESULTS AND DISCUSSION:

This part shows an empirical investigation of the economic and operational consequence of the PANDEMIC-19 pandemic on the small-scale industries in Nagpur District of primary information gathered on 150 units. The comparison of the key performance indicators in the three periods in the course of the pandemic- pre-pandemic, during the pandemic, and post-pandemic recovery are analysed in order to determine the magnitude of disruption as well as recovery. The test of the statistically significant nature of observed changes is done using inferential statistical methods, hence improving the validity of the interpretations.

Table 1: Comparison of Average Monthly Revenue (₹ in lakhs)

Period	Mean Revenue	Standard Deviation
Pre-PANDEMIC-19	6.40	1.85
During PANDEMIC-19	3.10	1.42
Post-PANDEMIC-19	4.90	1.67

According to its findings, it can be stated that average monthly revenue experienced a significant decrease in the PANDEMIC-19 period as revenue decreased more than 50 per cent as compared to the pre-pandemic period. Throughout, despite the recovery that is evident in the post pandemic time, average revenue level is lower than it was before PANDEMIC, indicating partial and uneven recovery in small-scale industries in Nagpur District.

Table 2: Employment Levels (Average Number of Workers per Unit)

Period	Mean Employment
Pre-PANDEMIC-19	18
During PANDEMIC-19	11
Post-PANDEMIC-19	14

During the pandemic, there was sharp decline in the levels of employment which represented layoffs of the workforce, reduction of wages, and reverse migration. Rehiring is gradual during the post-pandemic stage but employment has not yet recovered fully posing reason to be cautious among companies in terms of labour expenses and uncertainty of demand as well.

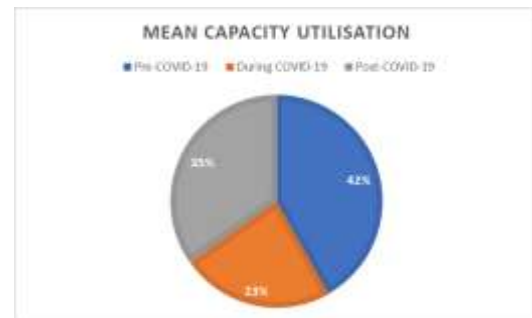


Fig. 1 Capacity Utilization

The utilisation of the capacity declined considerably during the pandemic because of lockdowns, disruptions in the supply-chain, and the decreased demand. The utilisation was increasing during the recovery period, but it was not high, which underlines the continuing limitation in operations and the depressed market demand.

Table 4: Hypothesis Testing – Impact of PANDEMIC-19 on Revenue

To test the above hypothesis, paired sample t-test has been applied to study the impact on the revenue before pandemic and during the pandemic

Particulars	Value
Mean Difference	3.30
t-value	14.72
p-value	0.000
Level of Significance	0.05
Result	Significant

The observation of the paired t -test indicates that there is a statistically significant difference in the amount of revenue pre-PANDEMIC and during-PANDEMIC because the calculated p -value is below the significance level of 0.05. This results in the rejection of the null hypothesis and confirms the claim that the PANDEMIC-19 was a severe factor affecting the revenues of small-scale industries in Nagpur District.

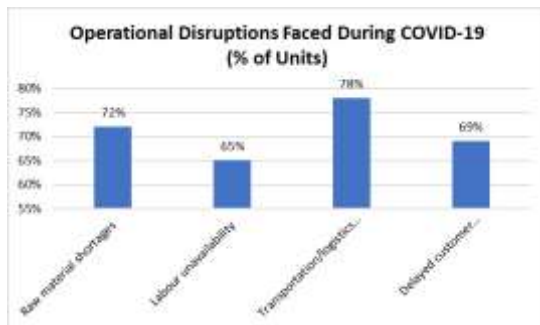


Fig. 2 Operational Disruption

Most of the interviewees complained of severe operation effects, especially in logistics and acquisition of raw materials. Late payments also worsened the liquidity status, which increased the stress of operations and restricted the potential of companies to resume normal production cycles.

The results of the empirical study are quite explicit, namely, that the PANDEMIC-19 pandemic had an extreme and statistically significant effect on the economy and operational activity of small-scale industries in Nagpur District. Though recovery tendencies are approved after the pandemic, the enduring deficit in revenues, employment, and capacity occupancy indicate that still lots of units can perform below their potential before the pandemic. The findings highlight the necessity of specific financial aid, enhancing supply chain, and competency-boosting measures that might allow the small-scale industries in the area to maintain resilience in the long run.

IV. CONCLUSIONS

The research concludes that the pandemic influenced the economic performance and operational stability of small-scale industries

in Nagpur District to a statistically significant negative of the given institution. According to empirical evidence, the fall in revenue, the level of employment and capacity utilisation has been sharp over the pandemic period mainly due to extended lockdowns, disruption of supply-chain, lack of labour and liquidity. Post-pandemic phase still demonstrates signs of a slow recovery, but key indicators are not yet up to the pre-pandemic rates, which means a partial and an uneven recovery of the sectors. The results also make it clear that companies that have fewer financial reserves and more reliance on local supply chains were more susceptible to an operational shock, which is indicative of structural vulnerability within the small-scale industrial ecosystem and exacerbated by the pandemic shock.

Recommendations

The study proposes formulating specific policy interventions, which are based on the findings, recommended to enhance the resilience and sustainability of the small-scale industries in Nagpur District. They should be prioritized on access to cheap credit and working capital by facilitating lending processes and support of banks and NBFCs, and payment receivables on time. To create a flexible operational approach and access to the market, capacity-building programs that are aimed at digital adoption, supply-chain diversification, and financial management skills should be encouraged. Also, it is important to institutionalise district-level support structures, such as joint logistics facilities, skill-building initiatives and emergency preparedness infrastructure to make small-scale industries more resilient to economic shocks in the future and quicken the recovery after the pandemic.

References

- Agarwal, V., Mathiyazhagan, K., Malhotra, S., & Pimpunchat, B. (2023). Building resilience for sustainability of MSMEs post PANDEMIC-19 outbreak: An Indian handicraft industry outlook. *Socio-*

- Economic Planning Sciences*, 85, 101443.
- Bartik, A. W., Bertrand, M., Cullen, Z., Glaeser, E. L., Luca, M., & Stanton, C. (2020). The impact of COVID-19 on small business outcomes and expectations. *Proceedings of the National Academy of Sciences*, 117(30), 17656–17666.
 - Canwat, V., et al. (2024). COVID-19-related supply chain disruptions: Resilience and performance implications for MSMEs. *Cogent Business & Management*.
 - Chen, Y., et al. (2023). The impact of COVID-19 containment lockdowns on MSMEs in India. *Journal of Public Economics*.
 - Khanna, S., & Rathore, U. (2021). Impact of COVID-19 on MSMEs: Evidence from a primary firm survey in India. *Economic and Political Weekly*, 56(24).
 - Sahoo, P., & Ashwani. (2020). COVID-19 and Indian economy: Impact on growth, manufacturing, trade and MSME sector. *Global Business Review*, 21(5), 1159–1183.
 - Sharma, A. K. (2023). Understanding the impact of COVID-19 on MSMEs in India: Lessons for resilient and sustained growth of small firms. *Journal of Small Business Strategy*.
 - Takeda, A., Truong, H. T., & Sonobe, T. (2022). The impacts of the COVID-19 pandemic on micro, small, and medium enterprises in Asia and their digitalization responses. *Journal of Asian Economics*, 82, 101533.
 - Apedo-Amah, M. C., Avdiu, B., Cirera, X., Cruz, M., Davies, E., Grover, A., ... Torres, J. (2020). *Unmasking the impact of COVID-19 on businesses: Firm-level evidence from across the world*. **World Bank Research Observer**, 36(1), 41–59. <https://doi.org/10.1093/wbro/lkab002>
 - Bartik, A. W., Bertrand, M., Cullen, Z., Glaeser, E. L., Luca, M., & Stanton, C. (2020). The impact of COVID-19 on small business outcomes and expectations. *Proceedings of the National Academy of Sciences*, 117(30), 17656–17666. <https://doi.org/10.1073/pnas.2006991117>
 - Dev, S. M., & Sengupta, R. (2020). COVID-19: Impact on the Indian economy. *Indira Gandhi Institute of Development Research Working Paper*, later adapted in *Indian Journal of Labour Economics*, 63(1), 1–17. <https://doi.org/10.1007/s41027-020-00241-0>
 - Eggers, F. (2020). Masters of disasters? Challenges and opportunities for SMEs in times of crisis. *Journal of Business Research*, 116, 199–208. <https://doi.org/10.1016/j.jbusres.2020.05.025>
 - Ghosh, S., Manna, S., & Sahu, T. N. (2021). COVID-19 and firm performance: Evidence from Indian MSMEs. *Small Enterprise Research*, 28(1), 1–20. <https://doi.org/10.1080/13215906.2021.1877340>
 - Ivanov, D. (2020). Viable supply chain model: Integrating agility, resilience and sustainability perspectives—Lessons from and thinking beyond the pandemic. *Annals of Operations Research*. <https://doi.org/10.1007/s10479-020-03640-6>
 - Kumar, S., & Ayedee, N. (2021). Technology adoption: A solution for SMEs to overcome problems during COVID-19. *Academy of Marketing Studies Journal*, 25(1), 1–11.

- Liguori, E. W., & Pittz, T. G. (2020). Strategies for small business: Surviving and thriving in the era of COVID-19. *Journal of the International Council for Small Business*, 1(2), 106–110. <https://doi.org/10.1080/26437015.2020.1779538>
- OECD. (2021). *The COVID-19 crisis and SMEs. OECD SME and Entrepreneurship Papers*. <https://doi.org/10.1787/09c8c6c0-en>
- Queiroz, M. M., Ivanov, D., Dolgui, A., & Fosso Wamba, S. (2022). Impacts of epidemic outbreaks on supply chains: Mapping a research agenda amid the pandemic. *International Journal of Production Economics*, 232, 107921. <https://doi.org/10.1016/j.ijpe.2020.107921>
- Sahoo, P., & Ashwani. (2020). COVID-19 and Indian economy: Impact on growth, manufacturing, trade and MSMEs. *Global Business Review*. <https://doi.org/10.1177/0972150920945687>
- Zhu, G., Chou, M. C., & Tsai, C. W. (2021). Lessons learned from the COVID-19 pandemic exposing the shortcomings of current supply chain operations: A long-term prescriptive offering. *Sustainability*, 12(14), 5858. <https://doi.org/10.3390/su12145858>