Available online at www.rajournals.in

International Journal of Management and Economics Invention

ISSN: 2395-7220

DOI: 10.47191/ijmei/v11i3.01

Volume: 11 Issue: 03 March 2025

International Open Access

Impact Factor: 8.518 (SJIF)

Page no. 3981-3988

Relationship between MSME Output, Exports and Economic Growth in India: An Econometric Study

Dr. Reena Dogra[1], Aprajita Kimta[2]

[1]Assistant Professor, Department of Economics, Himachal Pradesh University, Shimla.

[2]Ph.D. Research Scholar, Department of Economics, Himachal Pradesh University, Shimla.

ARTICLE INFO

Published Online: 03 March 2025

Corresponding Author: Aprajita Kimta

ABSTRACT

The MSME sector has emerged as a key pillar of the Indian economy, playing a vital role in the country's economic development through its significant contributions to output, exports, and employment. This study examines the causal links between MSME output, MSME exports, total exports, and India's GDP using the Johansen-Juselius cointegration test and the Granger causality test. The Johansen-Juselius test results reveal no strong evidence of a long-term cointegrating relationship among the variables. However, the Granger causality test, based on an unrestricted VAR model with first-differenced data, identifies bidirectional causality between GDP and MSME exports and between MSME exports and total exports.

KEYWORDS: MSME, Exports, GDP, Granger Causality, Cointegration, India.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a pivotal role in economic development across the globe, serving as engines of job creation, industrial growth, and innovation. MSMEs significantly contribute to GDP, manufacturing output, and exports in both developing and developed economies. According to the World Bank, MSMEs account for over 90 percent of businesses and contribute to more than 50 percent of employment worldwide. Their role extends beyond economic contributions, fostering entrepreneurship, technological advancement, and regional development, particularly in emerging economies.

In India, the MSME sector is one of the most dynamic and rapidly expanding segments of the economy. According to the Ministry of Micro, Small, and Medium Enterprises (GoI), MSMEs contribute around 30 percent to India's GDP, and nearly 45 percent to total exports. The sector provides employment to over 111 million people through over 63 million MSME units, making it the second-largest source of employment after agriculture (PIB)

Government initiatives such as Make in India, Atmanirbhar Bharat, the Production Linked Incentive (PLI) Scheme, and the Emergency Credit Line Guarantee Scheme (ECLGS) have further strengthened MSME growth, improving their productivity and global competitiveness (NITI Aayog, 2023). Digital transformation, financial inclusion, and skill development programs have also expanded opportunities for MSMEs, making them a crucial component of India's economic strategy. These developments underscore the sector's role as a key enabler of economic transformation and industrial resilience.

LITERATURE REVIEW

From the early stages of India's economic development, policymakers have recognized the critical role of Micro, Small, and Medium Enterprises (MSMEs) in fostering industrial diversification, employment generation, and regional economic growth. As a result, extensive research has been conducted to evaluate the sector's performance in terms of its contribution to GDP, industrial output, job creation, and export earnings, with the aim of informing policy decisions and addressing sectoral challenges. MSMEs contribute significantly to India's exports by engaging in diverse sectors such as textiles, pharmaceuticals, and engineering goods (Das & Narayana, 2021). One of the early studies analyzing the role of small enterprises was conducted by Patel (1971), who highlighted that while MSMEs contributed significantly to employment, their productivity lagged behind large-scale industries. Subsequent studies explored the efficiency and competitiveness of small-scale industries in India (Basant & Morris, 1987; Tendulkar, 1999; Natarajan, 2001), finding that MSMEs often faced challenges related to technology adoption, financial constraints, and lack of economies of scale. Several government and institutional reports have documented the growth trajectory of MSMEs. For instance, a report by the National Institute for Small Industry Extension

Training (NISIET, 2004) highlighted the consistent expansion of the sector in terms of employment and output. Additionally, the Reserve Bank of India (2015) and the Ministry of MSME (2020) have provided insights into the financial health of MSMEs, revealing that despite their contribution to the economy, they remain vulnerable to credit shortages and policy fluctuations. The post-liberalization period has witnessed an increasing number of studies analyzing the performance of MSMEs in the context of globalization (Das, 2006; Ray & Mukherjee, 2010; Chakraborty & Chatterjee, 2012). Das (2006) argued that while economic liberalization created new market opportunities, MSMEs struggled to compete due to their limited access to technology and capital. Similarly, Ray & Mukherjee (2010) found that globalization led to higher competition for Indian MSMEs in international markets, necessitating policy reforms to enhance their competitiveness. Chakraborty & Chatterjee (2012) examined the role of technology in improving MSME productivity and suggested that government interventions should focus on skill development and innovation to enhance sectoral performance. The relationship between MSME exports and overall economic growth has been another crucial area of research. Mishra & Jha (2013) applied cointegration techniques to study the long-term relationship between MSME exports and GDP growth in India. Their findings suggested that while MSME exports had a positive impact on economic growth, the relationship was not robust in the long run. Similarly, Verma (2018) explored the link between MSME production, exports, and macroeconomic indicators, concluding that MSME export growth is influenced by domestic industrial policies, currency fluctuations, and international trade agreements. Study by Sanu (2019) investigates the causal relationship between MSME output, MSME exports, total exports, and India's GDP using the Johansen-Juselius cointegration test and Granger causality test. The findings indicate no robust long-term cointegrating relationship among these variables. Additionally, a study by Bhattacharya (2011) utilizes cointegration analysis to examine the causal relationship between SMEs' output, exports, employment, number of SMEs, and their fixed investment, and India's GDP, total exports, and employment for the period 1973-74 to 2006-07. The results reveal a positive causality between SMEs' output and India's GDP, indicating that SMEs, including their export activities, play a significant role in the country's economic growth.

MSME Sector and its Role in the Indian Economy: An Overview

The Micro, Small, and Medium Enterprises sector is a cornerstone of the Indian economy, significantly contributing to GDP, employment, exports, and socio-economic development. MSMEs employ over millions of people, making them the second-largest employment generator after agriculture (Ministry of MSME). The sector has undergone significant transformation over the decades, evolving into a crucial driver of economic growth, employment, and exports. In the 1950s, small-scale industries (SSIs) were initially defined based on investment limits and labor force size, with institutional support from organizations like the Small Industries Development Organization (SIDO) and the National Small Industries Corporation (NSIC) (Ministry of MSME, 2020).

In the 1980s, policy shifts focused on fiscal incentives, credit support, and technological upgradation under the SSI Policy of 1980 (Natarajan, 2001). The government established cluster-based development programs and provided marketing assistance through the Khadi and Village Industries Commission (KVIC) and Coir Board (Mishra & Jha 2013). The 1985 Technology Upgradation Fund Scheme (TUFS) further strengthened technological modernization in small industries. In 1991, economic liberalization exposed Small-Scale Industries (SSIs) to increased competition, leading to financial distress for many traditional units. The establishment of the Small Industries Development Bank of India (SIDBI) enhanced financial support, while reservation policies for SSIs were gradually diluted to encourage competitiveness (Das & Narayan, 2021). A major milestone was the introduction of the Micro, Small, and Medium Enterprises Development (MSMED) Act in 2006, which redefined the sector by increasing investment limits and classifying MSMEs into manufacturing and service enterprises (MSME Annual survey). There was a push for digital transformation and policy strengthening, with initiatives like Make in India (2014), Startup India (2016), and GST (2017). The COVID-19 pandemic in 2020 severely impacted MSMEs, prompting the government to launch the Atmanirbhar Bharat Package, which introduced collateral-free loans, a revised MSME definition, and Udyam Registration for easier compliance (Chen et al., 2023).

Today, MSMEs contribute around 30 percent to India’s GDP and nearly 45 percent of exports (Economic Survey, 2023). Emerging trends such as Industry 5.0, fintech solutions, and AI/IoT adoption are reshaping MSME operations, improving productivity, and expanding market reach. Additionally, Free Trade Agreements (FTAs) influence MSME exports and global competitiveness (Huria et al., 2022). Strengthening MSMEs through digitalization, skill development, and policy innovation will be key to enhancing their global competitiveness and ensuring sustainable economic growth (World Bank, 2022). In recent years, the MSME sector has demonstrated notable resilience, with its contribution to the country's Gross Value Added (GVA) rising from 27.3 percent in 2020-21 to 29.6 percent in 2021-22, and further to 30.1 percent in 2022-23. This upward trend underscores its increasing significance in India's economic framework. Additionally, exports from MSMEs have witnessed substantial growth, surging from ₹3.95 lakh crore in 2020-21 to ₹12.39 lakh crore in 2024-25. The number of exporting

MSMEs has also expanded significantly, increasing from 52,849 in 2020-21 to 1,73,350 in 2024-25, reflecting their growing role in international trade (PIB, 2025).

Definition of MSME

In the Union Budget 2025-26, the Indian government has revised the classification criteria for Micro, Small, and Medium Enterprises (MSMEs) to support business expansion and improve efficiency. The updated definitions are as follows:

Table 1. Definition of MSMEs

Enterprise	Investment	Turnover
Micro	Up to ₹2.5 crore	Up to ₹10 crore
Small	Up to ₹25 crore	Up to ₹100 crore
Medium	Up to ₹125 crore	Up to ₹500 crore

(**Source:** PIB)

Methodological Framework, Data Source, and Variable Descriptions

Econometric Approach and Model Specification: This study employs the Engle-Granger methodology (Engle & Granger, 1981) to examine the causal relationship between various variables. Rather than using a multivariate model, a bivariate approach is adopted for different variable pairs separately to avoid the issue of multicollinearity. Engle and Granger demonstrated that if two time series, X_t and Y_t, are individually integrated of order one (i.e., they have a unit root and are denoted as I (1) and are cointegrated, then a causal relationship must exist in at least one direction. The presence of cointegration eliminates the possibility of spurious correlation. However, while cointegration confirms the existence of Granger causality, it does not specify its direction. This is determined using an Error Correction Model (ECM), which is derived from the long-run cointegrating relationship. According to the Granger Representation Theorem, if two variables, X_t and Y_t, are cointegrated, their relationship can be represented through an ECM, capturing both short-run and long-run dynamics.

This study follows a three-stage methodology to determine the direction of causality among variables. The first stage involves testing the order of integration by applying the Augmented Dickey-Fuller (ADF) test or other relevant unit root tests to the natural logarithm of the variables in their levels. This ensures that all variables are integrated of the same order before proceeding further. Based on the stationarity results, the second stage examines the cointegration relationship among the variables using the Johansen Maximum Likelihood method (Johansen, 1988; Johansen & Juselius, 1990). The Johansen-Juselius test, derived from a vector autoregressive (VAR) model, imposes restrictions on an unrestricted VAR to determine the presence of long-run relationships. If cointegration is identified, it confirms the existence of Granger causality, either unidirectional or bidirectional, indicating a stable long-term equilibrium among the variables. The final stage involves testing for causality using appropriate Granger causality tests, depending on the presence or absence of cointegration, to establish the direction of influence between the variables.

The three-stage procedure outlined above provides three possible approaches for testing causality. When the series are integrated of order one I(1) and exhibit cointegration, Granger causality can be analyzed using the variables in their levels. This is due to the super-consistency of the estimation process, as demonstrated in equations (1) and (2). In this context, the null hypothesis of no causality is tested by assessing the significance of the coefficients $\emptyset$ and γ.

$$Y_t = \alpha_1 + \sum_{i=1}^{m} \emptyset_i Y_{t-i} + \sum_{j=1}^{n} \gamma_j X_{t-j} + u_{1t} \quad (1)$$

$$X_t = \alpha_2 + \sum_{i=1}^{p} \lambda_i X_{t-i} + \sum_{j=1}^{q} \delta_j Y_{t-j} + u_{2t} \quad (2)$$

Here u_t and u_{2t} are zero-mean, serially uncorrelated disturbance terms.

If the variables are I(1) and cointegrated, the Granger causality test can be conducted using first-differenced data (denoted by Δ) along with an Error Correction Term (ECT) obtained from the cointegration regression, as shown in equations (3) and (4). In this framework, the direction of causality is determined not only by the significance of φ and γ but also by the coefficients of ECT.

$$\Delta Y_t = \alpha_1 + \sum_{i=1}^{m} \emptyset_i \Delta Y_{t-i} + \sum_{j=1}^{n} \gamma_j \Delta X_{t-j} + \theta_1 ECT_{t-1} + u_{1t} \quad (3)$$

$$\Delta X_t = \alpha_2 + \sum_{i=1}^{p} \lambda_i \Delta X_{t-i} + \sum_{j=1}^{q} \delta_j \Delta Y_{t-j} + \theta_2 ECT_{t-1} + u_{2t} \quad (4)$$

If the variables are I(1) but not cointegrated, a valid Granger-type test necessitates transforming the series by differencing them to achieve stationarity I(0), as illustrated in equations (5) and (6).

$$\Delta Y_t = \alpha_1 + \sum_{i=1}^{m} \emptyset_i \Delta Y_{t-i} + \sum_{j=1}^{n} \gamma_j \Delta X_{t-j} + u_{1t} \quad (5)$$

$$\Delta X_t = \alpha_2 + \sum_{i=1}^{p} \lambda_i \Delta X_{t-i} + \sum_{j=1}^{q} \delta_j \Delta Y_{t-j} + u_{2t} \quad (6)$$

The optimum lag length m, n, p, q and r are determined on the basis of Schwarz Information Criterion and/or Akaike Information Criterion.

Data Sources and Variable Descriptions

This study utilizes annual time-series data on Gross Domestic Product (GDP), total exports, MSME production, and MSME exports in India, covering the period 1973-74 to 2016-17. The data is primarily sourced from MSME Annual Reports (various issues) and the Handbook of Statistics on Indian Economy (various issues), Reserve Bank of India (RBI). Additional data has been collected from the Fourth All India Census of MSMEs (2006-07).

The key variables used in the study are as follows:

- lgdp = Gross Domestic Product of India at current prices (in Rs. Crore).
- lpro = MSME production in India (in Rs. Crore).
- lex = Total exports of India at current prices (in Rs. Crore).
- lmsmex = MSME exports at current prices (in Rs. Crore).

Here, l denotes the natural logarithmic transformation of the variables.

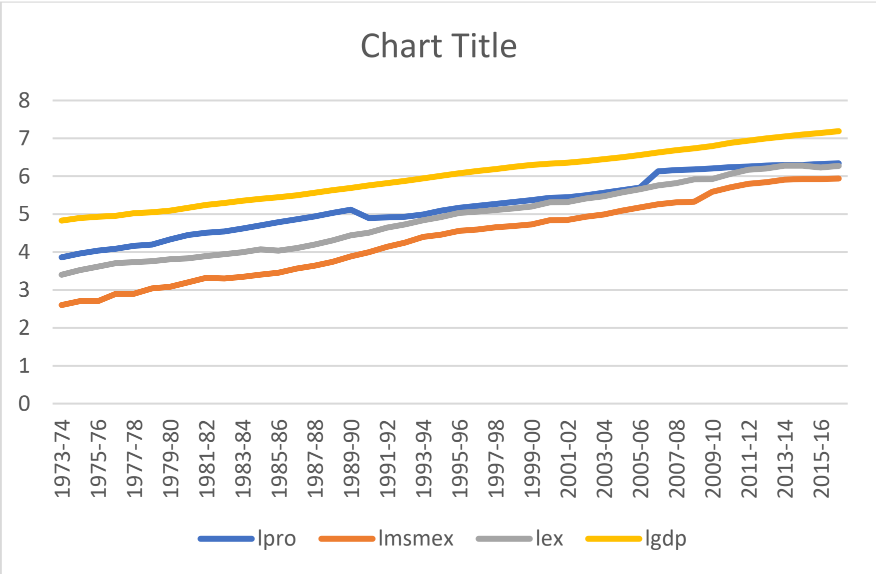

Figure 1. Graph of GDP (lgdp), MSME Production (lpro), Total Export (lex), and MSME Export (lmsmex).

RESULTS AND DISCUSSION

According to Granger (1988), a necessary but not sufficient condition for cointegration is that all variables must be integrated of the same order (greater than zero) or exhibit a deterministic trend. To assess this preliminary requirement, unit root tests were performed on the variables *lgdp, lex, lmsmex, and lpro* using the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1981) and the Phillips-Perron (PP) test (Perron, 1988; Phillips & Perron, 1988). The findings, summarized in Table 2, indicate that the null hypothesis of non-stationarity cannot be rejected at the level, as evidenced by their insignificant p-values. However, after first differencing the variables have attained stationarity. This implies that all variables are integrated of order one, I(1).

Table 2: Results of Unit Root Tests

Variables	**ADF**	**p-value**	**PP**	**p-value**
At levels				
lgdp	0.352973	0.9784	0.975	0.96
lpro	-0.809413	0.8063	-0.717	0.83
lmsmex	-0.947496	0.7632	0.977	0.75
lex	-1.106366	0.7048	-1.091	0.71
At first difference				
lgdp	-4.384883	0.0011	-4.44	0.000
lpro	-6.809147	0.0000	-5.323	0.000
lmsmex	-6.809147	0.0000	-6.814	0.000
lex	-5.825828	0.0000	-5.824	0.000

Notes: The optimal lag length for the ADF test is determined using the Akaike Information Criterion (AIC). For the PP test, the Bartlett Kernel estimation methods used, with bandwidth selection based on the Newey-West procedure. Both tests are performed with an intercept term included.

Since they share the same order of integration, it becomes possible to explore long-run relationships through cointegration techniques such as the Johansen cointegration test. The cointegration rank (**r**) of the series can be assessed using two test statistics: the *trace statistic* and the *maximum eigenvalue statistic*. However, this study considers only the trace statistic. Representing the number of cointegrating vectors as r, the trace test is conducted under the null hypothesis that r = k against the alternative r > k. The results of the Johansen-Juselius likelihood test for cointegration are presented in Table 3.

Table 3. Results of the Johansen test for cointegration

Null	Alternative	Trace Statistic	CV	p-value
Between lgdp and lpro				
r = 0	r > 0	23.35	25.87	0.0997
Between lgdp and lmsmex				
r = 0	r > 0	19.66	25.87	0.2436
Between lex and lmsmex				
r = 0	r > 0	9.938	25.87	0.9276
Between lpro and lex				
r = 0	r > 0	7.418	25.87	0.9900
Between lpro and lmsmex				
r = 0	r > 0	11.33	2.87	0.8556

The results of the Johansen cointegration test indicate that none of the variable pairs exhibit a significant long-run relationship. For all tested pairs—*lgdp and lpro, lgdp and lmsmex, lex and lmsmex, lpro and lex, and lpro and lmsmex*—the trace statistics fall below the corresponding critical values, and the p-values are greater than 0.05. Specifically, the highest test statistic (23.35 for lgdp and lpro) is still below the critical value (25.87), indicating that the null hypothesis of no cointegration cannot be rejected. Similarly, for lgdp and lmsmex, the test statistic (19.66) is also lower than the critical value, reinforcing the absence of a long-run equilibrium relationship. The remaining variable pairs show even weaker evidence of cointegration, with very low-test statistics and high p-values, suggesting no long-run association. To analyze the short-run dynamics among the variables, a Vector Autoregression (VAR) model in first differences is employed. The bivariate systems—*Δlgdp and Δlpro; Δlgdp and Δlmsmex; Δltx and Δlmsmex; Δlpro and Δltx; Δlpro and Δlmsmex* are examined using an unrestricted VAR model (Model 3, Eq. 5 and Eq. 6), where Δ represents the first difference operator, capturing the growth rates of the respective variables.

Furthermore, to account for structural changes in the MSME/SSI sector following the revised definition under the MSMED Act, 2006, a dummy variable (dummy1) is incorporated into the VAR model. This inclusion ensures that the impact of these definitional shifts on MSME performance is properly reflected in the analysis.

Table 4: Results of Granger Causality Test

Null Hypothesis	Wald Chi-Sq	Dof	p-value
Between lgdp and lpro			
Δlpro → Δlgdp	0.244	1	0.6211
Δlgdp → Δlpro	7.037	1	0.0080
Between lgdp and lmsmex			
Δlmsmex → Δlgdp	8.019	1	0.0046
Δlgdp → Δlmsmex	23.92	1	0.0000
Between ltx and lmsmex			
Δlmsmex → Δltx	10.27	2	0.0059
Δltx → Δlmsmex	7.889	2	0.0194

Between lpro and ltx			
Δlpro → Δltx	1.192	2	0.550
Δltx → Δlpro	3.112	2	0.210
Between lpro and lmsmex			
Δlpro → Δlmsmex	3.428	2	0.180
Δlmsmex → Δlpro	0.321	2	0.851

The Granger Causality Test results within the VAR framework provide critical insights into the interrelationships between GDP, MSME exports, total exports, and MSME productivity. The analysis reveals **bidirectional causality** between GDP and MSME exports, indicating a mutually reinforcing relationship. The null hypothesis that MSME exports do not Granger-cause GDP is rejected at a p-value of 0.0046, and similarly, the null hypothesis that GDP does not Granger-cause MSME exports is strongly rejected at a p-value of 0.0000. This confirms that MSME exports significantly influence GDP, while GDP, in turn, has an even stronger impact on MSME exports.

Similarly, **bidirectional causality** is found between MSME exports and total exports, suggesting that MSME exports fuel total exports. The null hypothesis that MSME exports do not Granger-cause total exports is rejected at a p-value of 0.0059, while the null hypothesis that total exports do not Granger-cause MSME exports is also rejected at a p-value of 0.0194. This indicates that both variables reinforce each other.

In contrast, a **unidirectional causal relationship** is observed between GDP and productivity. The null hypothesis that GDP does not Granger-cause productivity is rejected at a p-value of 0.0080, indicating that economic growth drives productivity. However, the null hypothesis that productivity does not Granger-cause GDP fails to be rejected at a p-value of 0.6211, suggesting that changes in productivity do not have a statistically significant impact on GDP.

On the other hand, **no causality** is detected between productivity and total exports. The null hypothesis that productivity does not Granger-cause total exports fails to be rejected at a p-value of 0.550, and the null hypothesis that total exports do not Granger-cause productivity also fails to be rejected at a p-value of 0.210. Similarly, no causality is found between productivity and MSME exports. The null hypothesis that productivity does not Granger-cause MSME exports fails to be rejected at a p-value of 0.180, and the null hypothesis that MSME exports do not Granger-cause productivity fails to be rejected at a p-value of 0.851. This indicates that productivity changes do not directly impact export performance, nor do exports contribute to productivity gains in the given dataset.

Overall, the findings highlight the critical role of MSME exports in driving GDP growth and total exports, reinforcing the importance of export promotion policies for economic expansion. Additionally, while GDP influences productivity, the lack of causality between productivity and exports suggests that other factors, such as technology, innovation, or skill development, might play a more dominant role in enhancing productivity.

To ensure the robustness of our VAR models, we conducted a residual serial correlation test and a heteroscedasticity test. The Breusch-Godfrey LM test for autocorrelation yielded a p-value of 0.2839, which is greater than the conventional 0.05 significance level. This indicates no significant evidence of serial correlation, meaning the residuals are independently distributed, ensuring the reliability of the model. Similarly, the Breusch-Pagan test for heteroscedasticity produced a p-value of 0.22, which is also above the 0.05 threshold, confirming that the residuals are homoscedastic. Since both tests return p-values above 0.05, we can conclude that our VAR model satisfies the assumptions of no autocorrelation and homoscedasticity, reinforcing its robustness and reliability.

Table 5. Diagnostic Test Results

Autocorrelation (Breusch-Godfrey LM test)	0.2839
Heteroskedasticity (Breusch Pagan test)	0.22

CONCLUSION

MSMEs are a crucial pillar of the Indian economy, significantly contributing to employment, industrial output, and exports. As engines of economic growth, they foster entrepreneurship, regional development, and innovation. Their flexibility and adaptability make them vital in strengthening economic resilience and reducing regional disparities. This study empirically examines the relationship between MSME performance, GDP growth, and export trends in India using time-series econometric methods. The findings highlight the crucial role MSMEs play in shaping the broader economy, particularly through their contributions to exports and industrial output. The results of unit root tests confirm that all variables under consideration are integrated of order one, allowing for further exploration of long-run relationships. However, the Johansen cointegration test indicates the absence of a stable long-term equilibrium among these variables, suggesting that MSME dynamics are largely driven by short-run fluctuations rather than persistent structural linkages. This could be attributed to factors such as policy uncertainties, changing market conditions, technological disruptions, and financial constraints that frequently affect MSME operations. Despite the lack of long-run cointegration, the Granger causality analysis within the VAR framework reveals significant short-run relationships. The presence of bidirectional causality between GDP and MSME exports underscores their mutually reinforcing impact: higher GDP facilitates MSME growth and export expansion, while MSME export sector contributes to overall economic performance. Similarly, the bidirectional causality between total exports and MSME exports highlights the integral role MSMEs play in driving India's trade competitiveness. The unidirectional causality from GDP to MSME productivity suggests that overall economic growth contributes to enhancing MSME efficiency; however, productivity improvements within the MSME sector alone do not significantly influence GDP growth. Furthermore, no significant causal link is found between MSME productivity and total exports, indicating that export growth is influenced by factors beyond just MSME efficiency.

These findings have important policy implications. Given the short-run linkages, policymakers should focus on targeted interventions that enhance MSME competitiveness, particularly through financial support, technological upgradation, and market access strategies. Strengthening MSME export capabilities can serve as a key driver of economic resilience, reinforcing India's growth trajectory. Additionally, policies aimed at fostering productivity improvements within MSME such as skill development programs and digital transformation, can further enhance their role in the economy. Overall, this study underscores the dynamic nature of MSMEs in India's economic landscape. While no long-term relationships are detected, the short-run causal interactions demonstrate the sector's responsiveness to economic fluctuations.

REFERENCES

1. Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2011). Small vs. young firms across the world: Contribution to employment, job creation, and growth. *World Bank Policy Research Working Paper, 5631*.
2. Basant, R., & Morris, S. (1987). "Small-Scale Industries in India: Economic Efficiency and Firm-Level Characteristics." *Economic and Political Weekly*, 22(8), M13-M21.
3. Beck, T., & Cull, R. (2014). Small- and medium-sized enterprise finance in Africa. *African Journal of Business Management, 8*(3), 53-63.
4. Bhasin, N., & Garg, S. (2020). MSME sector and macroeconomic variables: An empirical analysis using cointegration and causality approach. *Journal of Development Policy and Practice, 5*(2), 189-208.
5. Bhattacharya, D. (2011). "SMEs and Economic Growth in India: Cointegration Analysis." *Journal of Policy Modeling*, 33(6), 911-919.
6. Chakraborty, C., & Chatterjee, S. (2012). "Technology Adoption and Productivity Growth in Small Enterprises: A Comparative Study." *International Journal of Business and Economics*, 11(1), 45-62.
7. Chen, Y., Debnath, S., Sekhri, S., & Sekhri, V. (2023). The impact of Covid-19 containment lockdowns on MSMEs in India and resilience of exporting firms. *Journal of Economic Behavior & Organization*, *210*, 320-341.
8. Das, K. (2006). "Micro, Small and Medium Enterprises in India: Unfair Fare." *Economic and Political Weekly*, 41(20), 1997-2009.
9. Das, K., & Narayana, M. P. (2021). "MSMEs in India's Export Growth: Dynamics and Determinants." *Journal of Small Business Management*, 59(3), 345-367.
10. Das, K., & Narayana, M. R. (2021). MSMEs in India: Issues, challenges, and policy options. *Economic and Political Weekly, 56*(4), 45-53.
11. Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, 251-276.
12. Goldar, B., & Aggarwal, S. (2012). Impact of trade liberalization on productivity growth in Indian manufacturing. *Economic and Political Weekly, 47*(5), 56-64.
13. Granger, C. W. (1988). Causality, cointegration, and control. *Journal of Economic Dynamics and Control*, *12*(2-3), 551-559.
14. Hallberg, K. (2000). A market-oriented strategy for small and medium enterprises. *World Bank Discussion Paper, 40*.
15. Huria, S., Sharma, K., Jain, N., & Jose, A. (2022). Digitalization and Exports: A case of Indian Manufacturing MSMEs. *Available at SSRN 4089639*.
16. Johansen, S. (1988). Statistical analysis of cointegration vectors. Journal of economic dynamics and control, 12(2-3), 231-254.
17. Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration—with applications to the demand for money. Oxford Bulletin of Economics and statistics, 52(2), 169-210.
18. Kumar, N., & Francis, C. (2005). Global competitiveness and India's export performance. *Economic and Political Weekly, 40*(45), 4748-4756.

19. Melitz, M. J. (2003). The impact of trade on intra-industry reallocations and aggregate industry productivity. *Econometrica, 71*(6), 1695-1725.
20. Mishra, S., & Jha, S. K. (2013). "MSME Exports and Economic Growth in India: Cointegration and Causality Analysis." *Foreign Trade Review*, 48(4), 567-583.
21. MSME annual reports (various issues)
22. Natarajan, R. (2001). "Technology and Competitiveness: The Case of Small-Scale Industries in India." *Asian Economic Review*, 43(3), 415-428.
23. National Institute for Small Industry Extension Training (NISIET). (2004). "Performance of Small-Scale Industries in India: An Overview." *NISIET Research Report*.
24. Patel, V. G. (1971). "The Role of Small Enterprises in Employment Generation and Productivity." *Economic and Political Weekly*, 6(35), M97-M104.
25. Phillips, P. C., &Perron, P. (1988). Testing for a unit root in time series regression. Biometrika, 75(2), 335-346.
26. Ray, S., & Mukherjee, D. (2010). "Globalization and Its Impact on Small Scale Industries in India: A Study of Leather Industry." *Journal of South Asian Development*, 5(2), 229-249.
27. RBI (Various Issues), Handbook of Statistics on Indian Economy.
28. Reserve Bank of India. (2015). "Report on the Financial Status of Micro, Small and Medium Enterprises." *RBI Bulletin*, 69(11), 1234-1256.
29. Sharma, P., & Sehgal, R. (2019). Digital transformation and MSME growth in India: A policy perspective. *Indian Journal of Economics, 100*(2), 78-95.
30. Sanu, M. S. (2019). The Contribution of MSMEs in India’s Total Exports and GDP Growth: Evidence from Co-integration and Causality Tests. *book: Changing Horizons of Indian Business, Publisher: Bharti Publications, New Delhi (2019)*.
31. Tendulkar, S. D. (1999). "Indian Small-Scale Industries: Some Aspects of Size, Growth and Structure." *Journal of Development Studies*, 35(5), 70-100.
32. Tybout, J. R. (2000). Manufacturing firms in developing countries: How well do they do, and why? *Journal of Economic Literature, 38*(1), 11-44.
33. Verma, R. (2018). "Determinants of MSME Export Performance: Evidence from India." *Journal of Global Entrepreneurship Research*, 8(1), 23.
34. World Bank. (2020). *Small and medium enterprises in the global economy: Challenges and prospects*. Washington, DC: World Bank Publications.
35. https://msme.gov.in/
36. https://pib.gov.in/
37. https://www.niti.gov.in/
38. https://www.worldbank.org/
39. https://www.rbi.org.in/