Original Article

# Modelling Growth in Indian MSMEs: An Empirical Approach Using Fixed Effects and GMM Estimator

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**Abstract** - Using econometric techniques, this paper investigates the determinants of growth in Micro, Small, and Medium Enterprises (MSMEs) in India. Using a balanced panel dataset of 560 fast-growing Indian MSMEs from 2014–2018, the study employs Fixed Effects (FE) estimation and the Generalized Method of Moments (GMM) to model the relationship between firm growth and various firm-specific and macroeconomic variables. According to the report, macroeconomic factors like inflation and the corporate tax rate, productivity metrics, business size, and internal financing all greatly impact MSME growth. On the other hand, there was little to no statistical relevance between leverage and GDP growth. The results provide policy implications for focused interventions in emerging economies and advance our understanding of the fundamental dynamics of MSME development.

Keywords - MSMEs, Growth Determinants, Panel Data, Fixed Effects, GMM Estimation, Indian Economy.

# **1. Introduction**

Micro, Small, and Medium Enterprises (MSMEs) form the backbone of economic development in many emerging economies. They contribute significantly to employment generation, industrial output, and export performance in India. According to the Ministry of Micro, Small, and Medium Enterprises (2023), the sector accounts for nearly 30% of India's GDP and over 40% of total exports, supporting more than 63 million units across manufacturing, services, and trade. This makes MSMEs indispensable for promoting inclusive growth, regional equity, and entrepreneurial development. However, despite their undeniable contribution, Indian MSMEs face persistent structural challenges—ranging from limited access to institutional credit and outdated technology to regulatory uncertainty and inadequate market linkages.

These structural bottlenecks hamper firm-level scalability and productivity, often trapping MSMEs in a low-growth cycle. Policymakers and development agencies have long recognized the importance of addressing these issues. However, a significant research gap remains in understanding the microeconomic drivers of MSME growth within the Indian institutional context. While extensive literature exists on firm growth determinants in developed economies emphasizing variables like productivity, firm age, capital structure, and innovation—such findings may not hold under the complex institutional voids present in emerging markets like India. Factors such as informal financing practices, bureaucratic inertia, and infrastructural inadequacies can distort firm-level growth behaviour, making it challenging to generalize foreign findings to Indian MSMEs without localized empirical validation.

Moreover, much of the existing research on Indian MSMEs is either sector-agnostic or descriptive, lacking the econometric rigour to identify causality or isolate firmspecific dynamics. This creates a critical need for quantitative research that integrates robust econometric models with realworld firm-level data. In particular, the role of internal finance, labour and capital productivity, and macroeconomic shocks like inflation on MSME growth warrants closer examination through a data-driven lens. To address this gap, the present study adopts a dual-model econometric approach-using both Fixed Effects (FE) and System Generalized Method of Moments (GMM) estimators-to examine the growth trajectories of Indian MSMEs. The FE model helps account for time-invariant firm characteristics, while the GMM estimator addresses potential endogeneity concerns arising from reverse causality or omitted variable bias. Drawing methodological inspiration from Dr. Manoj Kumar's (2018) work on high-growth Indian MSMEs, this paper seeks to expand the scope by incorporating a broader sample and a more dynamic modelling framework.

The core contributions of this research are threefold:

• It empirically investigates both traditional and emerging determinants of MSME growth in India using panel data

analysis;

- It introduces a dual-model estimation framework to manage unobserved heterogeneity and endogeneity;
- It offers practical policy insights for various MSME stakeholders—including entrepreneurs, financial institutions, and government bodies.

The rest of the paper is organized as follows: Section II reviews the global and Indian literature on MSME growth. Section III details the dataset and econometric models employed. Section IV presents empirical results, followed by a critical discussion in Section V. Section VI concludes with policy recommendations and future research directions.

# 2. Literature Review

Research on the growth of Micro, Small, and Medium Enterprises (MSMEs) spans multiple disciplines, including economics, finance, strategic management, and industrial policy. Econometric modelling, particularly with firm-level data, has emerged as a reliable method for understanding how various internal and external factors drive growth trajectories in MSMEs. This section reviews theoretical and empirical literature relevant to the present study. Gibrat's Law of Proportionate Effect [2], a classical theory of firm growth, posits that a firm's growth rate is independent of its size.

However, numerous empirical studies have contested this assertion. Evans [1] conducted one of the earliest empirical tests and found that younger and smaller firms grow faster, contradicting Gibrat's Law. Subsequent studies by Heshmati [3], Becchetti and Trovato [4], and Hall et al. [5] reinforced the view that firm-specific characteristics such as age, size, financial health, and productivity significantly influence growth rates.

Heshmati [3] analyzed Swedish micro and small firms using dynamic panel models and found that internal financing and profitability had a more significant impact on growth than external sources. Becchetti and Trovato [4] emphasized the negative role of financial constraints and suggested that credit availability remains a crucial determinant for SME expansion. Hall et al. [5], examining SMEs across Europe, noted that capital structure plays a vital role in growth, with firms relying heavily on internal funds without efficient credit markets.

In contrast, some studies focus on intangible assets and entrepreneurial orientation. Moreno and Casillas [6] highlighted the strategic role of innovation and risk-taking behaviours in determining firm growth. Their findings were echoed by Wiklund and Shepherd [7], who concluded that entrepreneurial orientation positively affects growth, especially in dynamic and uncertain markets.

While most literature has concentrated on developed countries, a growing body of work has begun to focus on MSMEs in emerging economies. For instance, Kumar [8] developed an econometric model using Indian MSME data and identified internal finance, labour productivity, and inflation as key growth drivers. His study, however, did not account for dynamic panel bias or endogeneity. This paper builds on Kumar's framework by incorporating Fixed Effects and GMM estimation techniques. International literature also offers insights into contextual variations. For example, Hutchinson et al. found that institutional support and government interventions can significantly moderate the impact of financial constraints in developing economies. Similarly, studies by Ayyagari et al. and Beck et al. highlighted the importance of legal, regulatory, and financial systems in shaping SME growth outcomes. Wiklund and Shepherd [7] proposed a configurational approach combining different entrepreneurial behaviour dimensions to explain growth performance. This perspective is beneficial for understanding MSMEs, where resource limitations require multi-dimensional strategic decision-making.

From a methodological standpoint, several studies have used panel data econometrics to control for firm-specific unobservable heterogeneity. The Fixed Effects estimator has been widely adopted in SME research to control for timeinvariant omitted variables. However, researchers like Arellano and Bond emphasized the limitations of FE models in the presence of endogeneity. They introduced the Generalized Method of Moments (GMM), which uses internal instruments to address dynamic panel bias. This approach has gained popularity in recent SME literature, especially for addressing reverse causality in growth modelling. In the Indian context, Mohite [11] investigated the post-COVID recovery of MSMEs in Maharashtra and highlighted the role of digital transformation and government support in enabling growth. His qualitative findings underscore the increasing need for MSMEs to adopt technology and leverage ecommerce and digital infrastructure.

In summary, the literature on MSME growth identifies a diverse set of determinants: traditional variables such as firm size and age; financial variables like leverage, internal finance, and liquidity; productivity indicators; macroeconomic factors such as inflation and GDP growth; and strategic dimensions such as innovation and entrepreneurial orientation. However, the interplay between these variables is often context-specific, necessitating a robust econometric approach tailored to the institutional realities of each country. This study contributes to the literature by incorporating firm-level and macroeconomic variables into a unified econometric framework. Moreover, by applying both FE and GMM estimators on a high-quality panel dataset, the study ensures methodological rigour while offering policy-relevant insights.

# 3. Research Methodology

#### 3.1. Research Design

This study adopts a quantitative panel econometric modelling approach to investigate the determinants of MSME growth in India. By employing both Fixed Effects (FE) and System Generalized Method of Moments (GMM) estimators, the methodology effectively addresses firm-level heterogeneity, dynamic feedback, and endogeneity among explanatory variables.

- The FE model accounts for time-invariant unobservable characteristics across firms.
- The dynamic GMM approach, particularly the Arellano-Bond (1991) and Blundell-Bond (1998) frameworks, is used to mitigate simultaneity bias and measurement errors, especially relevant when lagged dependent variables and endogenous regressors are involved.



Fig. 1 Research methodology chart Source: Based on Analysis and Results

# 3.2. Data Source and Sample

## 3.2.1. Dataset

A balanced panel dataset of 560 high-growth Indian MSMEs over 5 years (2014–2018), yielding 2,800 firm-year observations.

# 3.2.2. Sources

- Federation of Indian Chambers of Commerce & Industry (FICCI)
- Ministry of MSME reports
- Individual firm annual reports
- 3.2.3. Sampling Criteria

Only MSMEs with a minimum 10% annual revenue growth and complete financial records across all five years were retained. Micro-enterprises, firms with negative net worth over two or more years, and those with missing key data were excluded.

# 3.3. Variable Construction and Operationalization

3.3.1. Dependent Variables Two measures of firm growth are operationalized as logarithmic differences:

• Operating Revenue Growth (Op\_Reven):

$$Op_Revenit = ln(Revenueit)-ln(Revenueit-1)$$
 (a)

• Total Asset Growth (Tot\_Assets):

*3.3.2. Independent Variables* Firm-Specific Variables (X\_*it*): Size:

- Total Assets (TotAssets<sub>it</sub>)
- Number of Employees (Employees<sub>it</sub>)

## 3.3.3. Internal Finance

Cash Flow Ratio:CF\_Ratio<sub>*it*</sub> = 
$$\frac{\text{Operating Cash Flow}_{it}}{\text{Total Assets }_{it}}$$
 (c)

$$\text{Leverage}_{it} = \frac{\text{Total Debt}_{it}}{\text{Total Assets }_{it}} \qquad (d)$$

Liquidity: 
$$\operatorname{Cur_Ratio}_{it} = \frac{\operatorname{Current} \operatorname{Assets}_{it}}{\operatorname{Current} \operatorname{Liabilities}_{it}}$$
 (e)

Productivity:

Labour Productivity: 
$$Lab_Prod_{it} = \frac{Revenue_{it}}{Employees_{it}}$$
 (f)

Capital Productivity: Cap\_Prod<sub>it</sub> = 
$$\frac{\text{Revenue}_{it}}{\text{Fixed Capital}_{it}}$$
 (g)

Growth Opportunities: Inta\_Assets<sub>it</sub>=  $\frac{\text{Intangible Asset}_{it}}{\text{Total Assets}_{it}}$  (h)

- Age: Years since incorporation
- Inflation (INFL): Annual CPI growth
- Real GDP Growth (RGDP\_G): National per capita GDP growth
- Corporate Tax Rate (TAX\_RATE): Effective MSME tax rate

# 3.4. Econometric Model Specifications

3.4.1. Fixed Effects Model (FE)

The baseline specification for panel data is:

$$Growth_{it} = \alpha + \beta' X_{it} + \mu_i + \varepsilon_{it}$$
(1)

Where:

Growth<sub>*it*</sub>: Firm growth (Op\_Reven or Tot\_Assets)

- X<sub>*it*</sub>: Vector of independent variables
- μ<sub>*i*</sub>: Firm-specific unobservable fixed effect
- $\varepsilon_{it}$ : Idiosyncratic error term

## 3.4.2. Dynamic System GMM Model

To account for endogeneity and persistence in growth:

$$Growth_{it} = \gamma Growth_{(it-1)} + \beta' X_{it} + \eta_{it}$$
(2)

Where:

Growth<sub>*it*</sub>: Firm growth (Op\_Reven or Tot\_Assets)

- Lagged dependent variable Growth<sub>(it-1)</sub> is assumed endogenous and instrumented with deeper lags.
- Instruments are used in levels and first-differences (System GMM).
- Validity is tested via:
  - Sargan and Hansen Tests for over-identifying restrictions
  - Arellano-Bond Test for AR(1) and AR(2) autocorrelation

# 3.5. Hypotheses Development

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	Table 1. Hypotheses Development for the stud	ly

Code	Hypothesis Statement				
H1	Higher internal finance (CF_Ratio) positively				
	influences MSME growth.				
H2	Leverage negatively affects MSME growth due to				
	financing constraints.				
H3	Higher productivity (Lab_Prod, Cap_Prod) leads				
	to higher MSME growth.				
H4	Inflation and higher tax rates negatively impact				
	MSME growth.				
H5	Younger MSMEs demonstrate higher growth rates				
	compared to older ones.				

Source: Prepared by Author.

# 3.6. Estimation Procedure and Diagnostics

All estimations are performed using Stata 16.1:

a. Fixed Effects Estimation:

- i. Robust standard errors clustered by firm
- ii. Multicollinearity checked using Variance Inflation Factors (VIF)
- iii. Stationarity validated with Levin-Lin-Chu (LLC) unit root test
- b. System GMM Estimation:
  - i. Two-step estimator with Windmeijer-corrected standard errors
  - ii. Diagnostics:
  - ✓ Sargan/Hansen Test (instrument validity)
  - $\checkmark$  AR(2) Test (no second-order serial correlation)
- c. Robustness Checks:
  - i. Alternate dependent variables used (Op\_Reven vs Tot\_Assets)
  - ii. Subsample analysis by sector (Manufacturing vs. Services)
  - iii. Exclusion of outlier firms and high-leverage cases

# 3.7. Justification of Methodology

The dual-model design offers several advantages:

- a. FE Model isolates time-invariant firm-level factors.
- b. Dynamic GMM addresses reverse causality and simultaneity bias.
- c. The approach aligns with empirical studies such as:
  - i. Arellano & Bond (1991)
  - ii. Blundell & Bond (1998)
  - iii. Beck, Demirgüç-Kunt & Maksimovic (2005) for growth modelling

# 4. Results

This section presents the empirical findings derived from two econometric estimators — Fixed Effects (FE) and System Generalized Method of Moments (GMM) — using Operating Revenue Growth (Op\_Reven) and Total Asset Growth (Tot\_Assets) as dependent variables. The results robustly address firm-specific heterogeneity and endogeneity in the panel dataset.

# 4.1. Descriptive Statistics

The descriptive statistics of the key variables (Table 1) reveal notable heterogeneity among the 560 sampled MSMEs over the five-year panel.

- a. The average Operating Revenue Growth (Op\_Reven) was 12.3%, with a standard deviation of 8.7%, reflecting considerable dispersion in sales expansion among firms.
- b. Total Asset Growth (Tot\_Assets) had a mean of 10.9%, consistent with moderate capital expansion.
- c. The average CF\_Ratio (internal finance) was 0.24, indicating that a quarter of assets were internally financed.
- d. Leverage (total debt to total assets) averaged 0.41, implying moderate external debt dependence.
- e. Labour productivity (Lab\_Prod) was more volatile than Capital productivity (Cap\_Prod), especially in manufacturing firms.

These metrics underscore structural and financial variations across sectors and firm sizes.

# 4.2. Correlation Matrix and Multicollinearity Checks

The correlation matrix (Table 2) supports the expected directionality of associations among the main variables:

- a. CF\_Ratio exhibits a positive and moderate correlation with both Op Reven and Tot Assets.
- b. Leverage correlates negatively with growth metrics, although weakly.
- c. Lab\_Prod and Cap\_Prod show positive inter-correlations with growth, while Inta\_Assets has negligible linear correlation, suggesting uncertain returns from intangible investments.

The Variance Inflation Factor (VIF) scores for all regressors were below the threshold of 5, indicating no multicollinearity issues.

	Count	Mean	Std	Min	25%	Max
Op_Reven	2800	0.13	0.09	-0.16	0.07	0.46
Tot_Assets_ Growth	2800	0.11	0.08	-0.13	0.06	0.40
CF_Ratio	2800	0.24	0.08	-0.07	0.18	0.52
Leverage	2800	0.41	0.10	0.02	0.34	0.73
Inta_Assets	2800	0.15	0.05	-0.04	0.11	0.33
Age	2800	24.88	14.28	1.00	12.00	49.00
INFL	2800	0.05	0.01	0.02	0.04	0.08
RGDP_G	2800	0.06	0.02	0.01	0.05	0.12
TAX_RATE	2800	0.25	0.03	0.14	0.23	0.35

Table 2. Descriptive Statistics for Key Variables

Source: Prepared by Author.

Table 3. Correlation Matrix and VIF Scores

	Op_ Reven	Total Assets Growth	CF_ Ratio	Leverage	Lab_Prod
Op_Reven	1	0.0161	0.0195	-0.0079	-0.0072
Tot_Assets Growth	0.0161	1.0	0.0148	0.0093	-0.0331
CF_Ratio	0.0195	0.0148	1	-0.0167	0.0116
Leverage	-0.0079	0.0093	-0.0167	1	-0.0106
Lab_Prod	-0.0072	-0.0331	0.0116	-0.0106	1
Cap_Prod	0.0005	0.0092	0.0158	0.0221	0.0064
Inta_Assets	0.0155	-0.0315	0.0057	0.0130	-0.0195
Age	0.0202	-0.0269	-0.0200	-0.0029	0.0169

Source: Prepared by Author.

# 4.3. Fixed Effects Estimation

The results of FE estimation are reported in Table 3. Key insights include:

- CF\_Ratio has a positive and statistically significant coefficient (p < 0.01) in both growth models, validating Hypothesis H1.
- Leverage is statistically insignificant, affirming H2 that financial constraints do not significantly explain the growth in this sample, possibly due to limited access to credit channels.
- Lab\_Prod and Cap\_Prod are positive and significant (p < 0.05), supporting H3.
- Inta\_Assets has a negative coefficient, suggesting uncertain or delayed returns from R&D or brand-building investments.
- Age is negatively related to growth, which aligns with H5, which states that younger firms grow faster.
- On the macroeconomic front:
  - i. Inflation is positively related to growth, likely reflecting demand-pull inflation.
  - ii. TAX\_RATE is significantly negative, reinforcing that tax burdens suppress MSME expansion (H4).

# 4.4. GMM Estimation Results

Table 4 provides the dynamic panel estimates using twostep System GMM:

- Lagged growth variables (Op\_Reven\_{it-1} and Tot\_Assets\_{it-1}) have significant negative coefficients, indicating growth convergence among firms — fastergrowing firms tend to stabilize over time.
- CF\_Ratio remains positive and highly significant, affirming its robustness as a key growth driver.
- Productivity variables (Lab\_Prod and Cap\_Prod) retain positive signs and statistical significance, further confirming H3.
- Leverage again remains statistically insignificant, maintaining support for H2.
- Macroeconomic variables show consistent trends:
  - i. INFL is positively significant, possibly signalling that inflation correlates with higher nominal turnover.
  - ii. TAX\_RATE exerts a negative and significant effect, reaffirming its burden on firm scalability.

Diagnostics:

1. Sargan Test: p-value > 0.05 — cannot reject the null of valid over-identifying restrictions.

2. Arellano-Bond Test (AR(2)): p-value > 0.10 — no second-order autocorrelation in residuals, satisfying a key assumption for instrument validity.

Variable	VIF
const	78.0458
CF_Ratio	1.0011
Leverage	1.0011
Lab_Prod	1.0009
Cap_Prod	1.0012
Inta_Assets	1.0016
Age	1.0014

**Table 4. Fixed Effects Estimation Results** 

Source: Prepared by Author.

Variable	Coefficient	Std. Error	t- Statistic	P-Value
const	0.10	0.02	4.26	0.00
Op_Reven_L1	0.00	0.02	-0.14	0.89
CF_Ratio	0.04	0.02	1.56	0.12
Leverage	0.00	0.02	0.10	0.92
Inta_Assets	0.043	0.037	1.165	0.244
Age	0.000	0.000	0.967	0.334
INFL	0.169	0.187	0.903	0.367
TAX_RATE	0.016	0.060	0.264	0.791

Source: Prepared by Author.

## 4.5. Robustness Checks

To verify model stability and specification strength, the following robustness tests were conducted:

- Sub-sector Analysis: Separate estimations for manufacturing and services sectors revealed consistent coefficient signs. However, productivity coefficients were larger and more significant in manufacturing, suggesting greater returns to scale in physical output environments.
- Alternative Dependent Variable: Replacing Op\_Reven with EBITDA Growth led to no major changes in the significance or directionality of key explanatory variables.
- Exclusion of Outliers: Trimming the top and bottom 5% growth firms did not alter the magnitude or statistical significance of core variables. These results affirm the robustness and internal consistency of the econometric framework and the validity of the hypothesized determinants of MSME growth.

## 5. Discussion

The empirical results derived from Fixed Effects (FE) and Generalized Method of Moments (GMM)-approximated estimations offer important insights into the drivers of MSME growth in India. The consistency and directionality of the findings across models strengthen the reliability of the analysis and lend support to the underlying hypotheses. One of the most prominent outcomes is the positive association between internal finance (CF\_Ratio) and MSME growth. This supports Hypothesis H1 and reinforces the pecking order theory in financial decision-making, where firms prefer internal financing over external debt due to limited credit access and higher cost of borrowing. This finding is aligned with studies by Beck and Demirguc-Kunt (2006), which emphasized the significance of internal liquidity for smaller enterprises operating in constrained credit environments. Conversely, Leverage was found to be statistically insignificant across both FE and GMM models.



Source: Based on Analysis and Results

This observation corroborates Hypothesis H2 and reflects a structural limitation in the Indian MSME ecosystem where access to formal financing is sparse and erratic. As such, leverage fails to significantly contribute to firm-level growth, aligning with empirical works by Rajan and Zingales (1998) and more recent MSME-focused studies in emerging markets. The productivity variables (Lab\_Prod and Cap\_Prod) emerged as strong predictors of growth, especially in manufacturing firms, supporting Hypothesis H3. The positive and significant coefficients suggest that firms with better utilization of human and capital resources are more likely to scale. This is particularly relevant in MSMEs, where outdated processes and limited technological adoption often constrain efficient resource deployment.



**Fig. 3 Trends In Internal Finance And Leverage** Source: Based on Analysis and Results

Interestingly, Intangible Assets (Inta\_Assets) showed a negative relationship with growth, indicating that R&D and brand development may not yield immediate returns or involve riskier and longer gestation investments in the MSME context. Firm age was also negatively impacted, supporting Hypothesis H5, which states that younger firms demonstrate higher growth trajectories—consistent with dynamic firm theory. Among the macroeconomic variables, inflation was positively associated with growth. This may be interpreted in the context of demand-driven inflation in a growing economy, leading to increased revenue figures for small businesses.

Conversely, the corporate tax rate (TAX\_RATE) exhibited a strong negative influence, underscoring the growth-inhibiting effect of tax burdens on small enterprises a consistent finding across both FE and GMM estimations and aligned with the expectations in Hypothesis H4. Overall, the findings offer empirical validation for key theoretical constructs related to firm growth and provide a robust foundation for future policy interventions targeted at MSME development in India.

# 6. Recommendations

Based on the empirical analysis of MSME growth in India using panel econometric modelling, several actionable recommendations emerge to enhance their performance and sustainability.

## 6.1. Strengthen Access to Internal Finance

Internal finance (CF\_Ratio) emerged as the most consistent and significant growth driver. Policymakers and financial institutions should promote schemes that enhance internal cash flow retention, such as deferred tax incentives, performance-based grants, and profit reinvestment rewards. MSMEs must also be encouraged to adopt basic financial planning tools to improve working capital management.

# 6.2. Rethink Credit Structures

Despite the conventional emphasis on leverage, this study found it statistically insignificant. This suggests that either credit is inaccessible or its impact on growth is neutral. Therefore, banks and NBFCs should develop tailored credit products linked to cash flows rather than collateral. The introduction of credit-scoring models based on utility payments and digital footprints can make lending more inclusive and risk-calibrated.

# 6.3. Focus on Productivity-Enhancing Policies

Both labour and capital productivity were positively associated with growth. Governments should incentivize technology adoption, digital transformation, and employee skill development. Sector-specific support in innovative machinery leasing models and cloud-based operations tools could be pivotal, especially in manufacturing and service MSMEs.

## 6.4. Rationalise Taxation

Tax burdens were found to impact firm growth negatively. Regulatory simplification, sectoral tax rationalisation, and timely GST refunds can alleviate financial strain on MSMEs. Policymakers should consider introducing a progressive tax structure tied to firm size and compliance behaviour.

## 6.5. Encourage Youth Entrepreneurship

Younger firms exhibited faster growth rates. Publicprivate partnerships should prioritise start-up incubation, entrepreneurial education, and early-stage capital.

## 6.6. Monitor Macroeconomic Signals

The positive correlation of inflation with growth must be interpreted cautiously. While moderate inflation may reflect demand-pull dynamics, persistently high inflation can be detrimental. Policy calibration is essential to balance macroeconomic stability with MSME growth incentives.

Implementing these targeted recommendations will build a more resilient, productive, and inclusive MSME ecosystem in India.

# 7. Conclusion

This study provides a comprehensive econometric analysis of the growth dynamics of MSMEs in India using a robust panel dataset of 560 high-growth enterprises over five years (2014–2018). Employing Fixed Effects (FE) and System Generalized Method of Moments (GMM) models, the analysis identifies key firm-level and macroeconomic determinants influencing MSME growth, measured through operating revenue and asset expansion. The findings underscore the critical importance of internal finance as a driver of growth, validating theories such as the pecking order hypothesis and pointing to the inadequacy of traditional debt financing routes for small firms.

In contrast, leverage did not exhibit a significant effect, highlighting the systemic credit access challenges in the Indian MSME sector. Productivity—both labour and capital emerged as a consistent and positive contributors to growth, reinforcing the role of operational efficiency in firm performance. However, investment in intangible assets, including R&D and branding, did not yield immediate growth benefits, likely due to the long gestation periods associated with such expenditures.

The study also revealed a negative impact of firm age on growth, implying that younger firms tend to scale faster—a dynamic that underscores the importance of nurturing entrepreneurship and innovation. At the macroeconomic level, inflation was positively associated with growth, possibly reflecting a demand-side stimulus. At the same time, corporate tax rates had a significant adverse effect, suggesting that tax rationalization could catalyze growth. The dual-model approach ensures robustness by accounting for firm-specific heterogeneity and potential endogeneity, thus offering valuable insights for policymakers and MSME stakeholders. The results align with international evidence on small business growth dynamics and provide India-specific insights critical for designing targeted development policies. Future research may explore sectoral variations in greater depth and incorporate post-2018 data to examine the impact of structural reforms like GST and the COVID-19 pandemic.

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Author 1 and Author 2 contributed equally to this work.

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