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# Does Credit Constraint Hinder Exporters' Investment? Evidence from Indian MSMEs

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### Abstract

The manufacturing sector in India is characterized by a large number of MSMEs (Micro, Small, and Medium Enterprises), which are particularly vulnerable when it comes to financing their investments. This study investigates the impact of credit constraints on the investment decisions of MSME and exporting firms within the Indian manufacturing sector. It analyses data from 1,412 manufacturing firms listed on the Bombay Stock Exchange (BSE) from 1990 to 2022. To examine the role of credit constraints on investment, the study employs the Investment Cash Flow Sensitivity (ICFS) approach, utilizing a two-step system GMM method. The study finds that the ICFS of MSMEs is negative and statistically significant, while the ICFS of exporting firms is positive but not statistically significant. Additionally, the ICFS of MSME exporters is negative but not significant, whereas it is negative and significant for MSME non-exporters. Overall, the results suggest that Indian exporters, along with MSME exporters, can secure external financing for their investment. However, MSMEs and MSME non-exporters face significant credit constraints, which hinder their investment capabilities. While numerous studies on Indian firms suggest a positive ICFS due to credit constraints, this study reveals that ICFS is non-monotonic in relation to the degree of credit constraint among Indian MSMEs. This finding shed new light on the negative ICFS observed in Indian MSMEs. The findings have important policy implications. The government needs to enhance investment expenditure among MSMEs by providing better access to credit, which could, in turn, improve the export performance of the Indian manufacturing sector.

Keywords: Credit Constraint, Export, Investment Cash Flow Sensitivity (ICFS), Two-Steps System GMM.

# Introduction

Since the liberalization policy of 1991, India has focused on export-led growth, yet the country's performance in international trade has remained underwhelming (Figure 1). India has persistently faced a current account deficit (CAD), where export earnings are less than import expenditures. Despite the depreciation of the Indian rupee against the US dollar, a factor typically expected to boost export performance, there has been little improvement relative to imports. The anticipated advantage from the rupee's competitive depreciation has been negligible. The Indian manufacturing sector, which contributes the largest share to the country's total exports, has also underperformed in its export activities (Figure 2). This raises a critical question: why is the export performance of the Indian manufacturing sector so poor?

Literature suggests that a firm's productivity plays a significant role in entering and succeeding in the export market (1). Investment is crucial for enhancing productivity and export performance (2). Similarly, study shows that new investments are vital for young firms to improve productivity and sustain themselves in the export market (3). Exporting firms must expand their fixed capital, such as machinery and buildings, to meet foreign market demand. Thus, investment in fixed capital and research and development boosts a firm's productivity and, by extension, its export performance. However, India's gross fixed capital formation (GFCF) has not shown significant improvement (Figure 3), prompting the question: why is the gross investment in the Indian economy so low?

A significant number of MSMEs are engaged in export activities across various sub-sectors of the Indian manufacturing sector (Figure 4). In a perfect capital market, firms' internal and external finances are perfect substitutes, making financing decisions independent of investment decisions (4). However, in an imperfect capital market, lenders demand a premium on loans due to asymmetric information, making external finance more

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expensive than internally generated funds. This credit constraint influences real variables and, consequently, a firm's investment decisions, with small firms being the most affected (5, 6). Several factors contribute to these constraints, including lenders' difficulty valuing small firms due to asymmetric financial information (7). In emerging markets, a high degree of asymmetric information

leads to adverse selection before lending and moral hazard after lending, ultimately resulting in credit rationing (8 -10). Credit rationing is a primary cause of credit constraints for small firms (9, 10). This raises another question: do MSMEs in the Indian manufacturing sector face credit constraints that adversely affect their investment?



Figure 1: Export to GDP Ratio Collected from the Reserve Bank of India (RBI)



Figure 2: Ratio of Export by Manufacturing Sector to Total Export Collected from RBI



Figure 3(A): Gross Fixed Capital Formation (GFCF) Collected from RBI, Ratio of GFCF to GDP



Figure 3(B): Gross Fixed Capital Formation (GFCF) Collected from RBI, Growth of GFCF



**Figure 4:** Number of MSME and Large Firms in Each Sub-Category of the Manufacturing Sector Notes: This figure consists of 3419 exporting firms (at least one year of export between 1991 and 2020) from the Indian manufacturing sector, where 854 are large-size firms, and 2551 are MSME firms. MSME is defined as per the Indian government classification (investment in plant and machinery or equipment). The vertical axis represents sub-sectors of the manufacturing sector. The horizontal shows the number of firms in each sub-sector.

While many MSMEs are involved in export activities across sub-sectors of the Indian manufacturing sector (Figure 4), the share of exports in total sales for MSMEs is lower than that of large firms (Figure 5). The study says export firms rely more on external than internal funds due to additional upfront costs (11). These fixed or sunk costs associated with international trade include learning about profitable export opportunities, making market-specific investments, product customization, regulatory compliance, and establishing and maintaining financial distribution networks. Beyond fixed costs, exporters also face variable costs such as shipping, duties, and freight insurance. Moreover, exporting firms often realize revenue from exports later than domestically operating firms, making them more credit-constrained. The study emphasizes that credit constraints are crucial to international trade flows (11). This raises a final question: do MSME exporters in the Indian

manufacturing sector face credit constraints that negatively impact their investment?

This study examines the impact of credit constraints on investment in the Indian manufacturing sector. It analyzes data from 1,412 BSE-listed Indian manufacturing firms from 1990 to 2020, using the Investment Cash Flow Sensitivity approach and a two-step system GMM method to estimate the models. The findings reveal that MSMEs in the Indian manufacturing sector suffer from credit constraints, leading to poor investment outcomes. However, exporters, including MSME exporters, do not appear to face significant credit constraints. On the other hand, MSME non-exporters within the Indian manufacturing sector are particularly affected by credit constraints. These findings have important policy implications, especially for MSMEs and MSME non-exporters, as they highlight the need for measures to improve investment and facilitate entry into the export market to enhance the export performance of the Indian manufacturing sector.



Figure 5: The Share of Export in the Total Sales of MSME and Large Firm

**Notes:** This figure consists of 3419 exporting firms (at least one year of export between 1991 and 2020) from the Indian manufacturing sector, where 854 are large-size firms, and 2551 are MSME firms. MSME is defined as per the Indian government classification (investment in plant and machinery or equipment). The vertical axis represents the share of Exports in total sales. The horizontal shows the time periods.

This study contributes to the existing literature in several ways. First, it focuses on the role of exports in reducing the credit constraints faced by the Indian manufacturing sector, particularly among MSMEs. While there is extensive literature on Indian firms, few studies have specifically examined the role of export activities. Second, the study explores the impact of credit constraints on the investment decisions of MSMEs within the Indian manufacturing sector. Given this sector's many MSMEs, it is crucial to understand how credit constraints affect their investment and participation in export activities. Although many studies use firm size as a proxy for credit constraints, the role of MSMEs in this context has not been adequately explored in Indian literature. Third, the study identifies the influence of previous investment on current investment through the two-step system GMM, supporting the dynamic accelerator theory of investment (12). Previous Indian studies have often overlooked the role of prior investment in current investment decisions due to the lack of appropriate econometric modelling. By employing the two-step system GMM, this study allows for using lagged dependent variables as independent variables. Finally, the study reveals that investment cash flow sensitivity is non-monotonic concerning the degree of credit constraint. Firms with the lowest cash flow, highest growth opportunities, and severe financial constraints exhibit negative investment cash flow sensitivity (13). This study sheds light on the negative sensitivity of investment cash flow, contributing to a deeper understanding of investment behaviour in the face of credit constraints.

The paper is organized as follows: the second section briefly reviews the literature on credit constraints and investment. The third section explains the empirical methodology used in the study. The data and descriptive statistics are provided in the fourth section. The fifth section reports the results and discussion. The final section offers conclusions and policy implications. Numerous studies argue that credit constraints play a significant role in investment decisions. Corporate investment is affected by financial constraints in the case of small and young firms (14). In addition, the impact was more significant during the 2008 financial crisis (14, 15). Further literature suggests that credit constraints affect the investments of non-financial firms more than financial firms (16).

Several studies have explored the investment behavior of the Indian manufacturing sector through neoclassical investment models (17, 18). The impact of credit constraint on investment is shown through interest rate and credit constraint channels of monetary transmission policy (18). In addition, demand factors, internal liquidity, past investment decisions. and traditional determinants such as output and profit explain the investment behavior of the Indian manufacturing sector (17). The study also shows that the 1991 financial liberalization policy did not significantly improve the investment expenditures of the Indian manufacturing sector (17).

While internal liquidity and profitability are associated with investment decisions, internal liquidity has a more pronounced effect on investment (19). In addition, creditworthiness is a major factor influencing investment decisions, arguing that after neo-liberalization, internal liquidity, profitability, and creditworthiness have become more critical than market demand (19).

Moreover, the investment decision of public limited Indian firms is significantly affected by demand-side factors, such as firm size, dividend payout ratio, effective borrowing cost, cash flow ratio, and growth in production value (20). Additionally, macro-level factors like the real exchange rate and capital market development influence investment decisions (20).

The above studies have examined various determinants of investment for Indian manufacturing firms, considering factors like sales, borrowing, operating profit, equity capital, net assets, and user cost of capital in their analyses. Most studies have employed the neoclassical investment model, revealing that lagged sales (output) are also a major determinant of investment, which supports the explanatory power of the accelerator theory concerning the investment behavior of Indian manufacturing firms. Additionally, these studies found a positive effect of operating profit on investment, indicating imperfections in the Indian capital market. However, while these studies have explored the relationship between investment and credit constraints in India, significant research gaps remain.

Previous studies on Indian manufacturing firms have largely overlooked MSME and exporting firms. Some literature suggests that export activities enhance firm productivity, reducing dependence on external funds, as earnings from exports can serve as internal cash to finance projects. Moreover, the impact of credit constraints on the investment of Indian MSMEs has not been adequately examined despite the significant involvement of MSMEs in export activities. Understanding the role of credit constraints on MSME investment is crucial for improving export performance. Many Indian studies have observed positive investment cash flow sensitivity (ICFS) among firms in the Indian manufacturing sector, indicating that these firms face credit constraints. However, these studies have not specifically examined the sector's ICFS of exporters and MSMEs. This study seeks to address this gap. Although exporting firms may rely more on external finance due to upfront costs, their higher productivity levels may reduce credit constraints from external sources, a factor not adequately explored in previous Indian literature. Based on the theoretical frameworks, empirical literature, and identified research gaps, this study formulates the following research questions: Does the investment of Indian manufacturing firms get affected by credit constraints and export activities? Is it influenced by the credit constraints explicitly faced by Indian MSMEs and Indian exporters? Furthermore, does the investment behavior differ based on the credit constraints experienced by Indian MSME exporters and non-exporters?

To address the research questions, this study aims to examine the role of credit constraints and export activities on the investment behavior of Indian manufacturing firms. It also seeks to investigate how credit constraints faced by Indian MSMEs and Indian exporters influence these firms' investment decisions. Furthermore, the study explores the impact of credit constraints on investment by distinguishing between Indian MSME exporters and non-exporters.

In line with the objectives of the study, the following null hypotheses  $(H_0)$  have been formulated based on theoretical frameworks and empirical evidence:

- Credit constraints and export activities do not affect the investment of Indian manufacturing firms.
- Credit constraints faced by Indian MSMEs and exporters do not affect the investment of Indian manufacturing firms.
- Credit constraints faced by Indian MSME exporters and non-exporters do not affect the investment of Indian manufacturing firms.

# Methodology

To examine the impact of credit constraints on investment, this study employs an empirical model based on established investment theories, namely the accelerator and neoclassical theories. The analysis utilizes the Investment Cash Flow Sensitivity (ICFS) approach to capture the role of credit constraints and exports on investment. Five empirical models (from equation 1 to 5) are formulated based on these theories, incorporating other factors such as liquidity, dividends, and the cost of borrowing. The study applies a two-step system GMM method to estimate these models, which aligns with dynamic accelerator theory, which posits that previous investment is a significant determinant of current investment (12).

First, the following model examines the influence of credit constraints and export activities on the

investment decisions of Indian manufacturing firms.

$$INV_{i,t} = \beta_1 INV_{i,t-1} + \beta_2 CF_{i,t} + \beta_3 EXP_{i,t} + \beta_4 SALE_{i,t} + \beta_5 LIQ_{i,t} + \beta_6 DIV_{i,t} + \beta_7 COB_{i,t} + \theta_i + \gamma_t$$

$$+ \mu_{i,t}$$

$$(1)$$

Where INV = Investment, CF = Cash Flow, EXP = Export to Sales ratio, SA = Sales to Capital ratio, LIQ = Liquidity, DIV = Dividend, and COB = Cost of Borrowing.  $\theta_i$  denotes firm-specific effects,  $\gamma_t$  represents time-specific effects and  $\mu_{i,t}$  is the error term, with i and t indicating firm and time, respectively.

In all models, from equation 1 to 5,  $\beta_1$  represents the relationship between past and current investments, with the expectation that  $\beta_1 > 0$ , as past investment typically encourages further investment. This is consistent with the dynamic accelerator theory, which emphasizes the role of previous investment in influencing current investment (12).

Similarly,  $\beta_2$  denotes ICFS, with the expectation that  $\beta_2 > 0$ . When firms face difficulties in securing

external funding, internal cash flow often finances current investments. According to the pecking order theory, firms prefer internal funds due to lower risk, and liquidity theory suggests that firms resort to internal funds when external financing is challenging. These theories posit that cash flow positively correlates with investment and is especially sensitive for credit-constrained firms. The sensitivity of investment to cash flow is a measure of financial constraint (21). A positive ICFS indicates that a firm is financially constrained (22).

Second, to examine the effects of credit constraints by MSMEs and exporters on investment in the Indian manufacturing sector, the study employs the following two models:

$$INV_{i,t} = \beta_1 INV_{i,t-1} + \beta_2 CF_{i,t} + \beta_3 (CF_{i,t} * MSME_i) + \beta_4 EXP_{i,t} + \beta_5 SALE_{i,t} + \beta_6 LIQ_{i,t} + \beta_7 DIV_{i,t}$$
[2]  
+  $\beta_8 COB_{i,t} + \theta_i + \gamma_t + \mu_{i,t}$   
$$INV_{i,t} = \beta_1 INV_{i,t-1} + \beta_2 CF_{i,t} + \beta_3 (CF_{i,t} * EXP_D_i) + \beta_4 EXP_{i,t} + \beta_5 SALE_{i,t} + \beta_6 LIQ_{i,t} + \beta_7 DIV_{i,t}$$
[3]  
+  $\beta_8 COB_{i,t} + \theta_i + \gamma_t + \mu_{i,t}$ 

In equation 2,  $\beta_3$  represents the ICFS of MSMEs, with the study anticipating  $\beta_3 < 0$  due to the credit constraints faced by MSMEs. In equation 3,  $\beta_3$  reflects the ICFS of exporters, with the expectation that  $\beta_3 > 0$  as exporters generally have better access to external funds.

Third, the following two more models are formulated to assess the credit constraints faced by MSME exporters and non-exporters on investment in the Indian manufacturing sector:

$$INV_{i,t} = \beta_{1}INV_{i,t-1} + \beta_{2}CF_{i,t} + \beta_{3}(CF_{i,t} * MSME_{i} * EXP_{D_{i}}) + \beta_{4}EXP_{i,t} + \beta_{5}SALE_{i,t} + \beta_{6}LIQ_{i,t}$$

$$+ \beta_{7}DIV_{i,t} + \beta_{8}COB_{i,t} + \theta_{i} + \gamma_{t} + \mu_{i,t}$$

$$INV_{i,t} = \beta_{1}INV_{i,t-1} + \beta_{2}CF_{i,t} + \beta_{3}(CF_{i,t} * MSME_{i} * NON_{EXP_{D_{i}}}) + \beta_{4}EXP_{i,t} + \beta_{5}SALE_{i,t}$$

$$+ \beta_{6}LIQ_{i,t} + \beta_{7}DIV_{i,t} + \beta_{8}COB_{i,t} + \theta_{i} + \gamma_{t} + \mu_{i,t}$$
[5]

In equation 4,  $\beta_3$  denotes the ICFS of MSME exporters, with the study expecting  $\beta_3 < 0$  due to the credit constraints they face. In equation 5,  $\beta_3$  reflects the ICFS of MSME non-exporters, where  $\beta_3 < 0$  is also expected due to their limited access to external funds.

The coefficients  $\beta_3$  and  $\beta_4$  in the first model (Equation 1) and  $\beta_4$  and  $\beta_5$  in last four models (Equation 2 - 5) capture the relationship between exports and sales with investment. The study

anticipates a positive association, implying that higher demand increases investment. Export earnings are particularly crucial, as they generate internal funds that can be reinvested. The accelerator investment theory suggests that output growth drives investment (23). Later, this theory is extended by including the influence of previous investments (12).

The study also expects a positive relationship between the liquidity ratio and investment,

especially for smaller firms, as per the liquidity theory (23). A positive association between the dividend payout ratio and investment is also anticipated, with dividend payout as a proxy for external financial constraints (20, 24). Conversely, the study expects a negative relationship between the cost of borrowing and investment, as higher interest rates discourage investment by increasing the cost of debt (20).

# Why Negative Investment Cash Flow Sensitivity?

According to theory, positive ICFS value reflect the credit constraints faced by firms (24). However, several studies criticize the positive ICFS, arguing that ICFS is non-monotonic concerning credit constraints (25-28). Studies found that less constrained firms exhibit higher ICFS than more constrained firms (26, 28). Some studies identified a U-shaped relationship between internal funds and investment (27, 28). This non-monotonic relationship suggests that investment increases with low cash flow but decreases when cash flow is high. A study attributes negative ICFS to the corporate life-cycle hypothesis (13). In contrast, other studies explore two aspects: endogenous financial costs or revenue effects and the corporate life-cycle hypothesis (28, 29).

# Why Two-Step System GMM?

GMM estimation is designed for dynamic panel models (30, 31). This estimation allows the dependent variable's lag to be used as an independent variable. This estimation is appropriate when the time period is smaller than the number of panels. This model corrects the endogeneity by introducing more instrumental variables in the system and transforming the instrument to make them uncorrelated with the fixed effect. This system uses orthogonal deviation. System GMM subtracts the current observation from the average of all the future available observations of a variable instead of subtracting from the previous observation. The estimation is computed for all the observations except the last for each individual, which minimizes data loss. System GMM is also appropriate in the presence of heteroscedasticity and serial correlation.

# **Data and Descriptive Statistics**

The primary objective of this study is to examine the impact of credit constraints on investment, specifically for MSMEs and exporters of the Indian manufacturing sector. Given India's status as an emerging economy with an underdeveloped financial market, Micro, Small, and Medium Enterprises (MSMEs) in the manufacturing sector frequently encounter significant credit constraints (7-10). This context makes Indian firms a relevant subject for analysis.

The analysis utilizes data on manufacturing firms from 1991 to 2022. Since implementing the liberalization policy in 1991, India has pursued an export-led growth strategy. Despite currency depreciation, export levels have not met expectations. Therefore, this study encompasses the period from the 1991 liberalization policy to the present.

## **Data Description**

Data for this analysis are sourced from the CMIE Prowess database. The study includes 1,412 firms listed on the Bombay Stock Exchange (BSE) in the manufacturing sector. Table 1 describes all variables used in the analysis. The study employs the seventh root transformation of the variables and removes outliers through winsorization at the 1% level from both ends.

## **Sample Segregation**

To analyze the role of credit constraints and export activities in investment decisions, the study categorizes the sample into exporting and nonexporting firms, subdivided into MSMEs and large firms. A firm is classified as an exporting firm if the average percentage of exports to total sales exceeds 10% from 1990 to 2022. Firms are categorized as MSMEs if their plant, machinery, or equipment investment does not exceed Rs. 50 crores.

Table 2 shows the segregation of the total sample used in the analysis. The sample of 1,412 firms comprises 925 non-exporting firms and 487 exporting firms. Among these, there are 487 large firms and 925 MSMEs. Within the exporting firms, there are 197 large firms and 290 MSMEs. Meanwhile, there are 290 large firms and 635 MSMEs among the non-exporting firms. The largest number of non-exporters in the MSME group and other groups justify the poor performance export performance of the manufacturing sector since MSMEs face credit constraints in developing countries (7-10).

Variables	Code	Relation	Measures
Investment	INV	Depended	The difference between the previous year's fixed assets
			(gross fixed assets) and the current year's fixed assets
			(gross fixed assets) is divided by the previous year's
			fixed assets.
Cash Flow	CF	Positive	Profit after tax divided by capital (previous year fixed
			assets)
Export	EXP	Positive	Export to sale (in percentage)
Sales	SA	Positive	Sale divided by capital (previous year fixed assets)
Liquidity Ratio	LIQ	Positive	The ratio of current assets to total assets
Dividend Payout	DIV	Positive	Dividends paid as a percentage of profits after tax
Ratio			
Cost of Borrowing	COB	Negative	Interest payments to the total outstanding borrowings of
			the firm

 Table 1: Variable Description

Table 2: Segregation	of Total	Sample
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Size of the firm	Non-Exporter	Exporter	Total
Large	290	197	487
MSME	635	290	925
Total	925	487	1412

## **Descriptive Statistics**

Table 3 presents descriptive statistics for the dependent variable and major independent variables-investment (INV), cash flow (CF), export-to-sales ratio (EXP), and sales-to-capital ratio (SA)-for the entire sample as well as for different subgroups. Four groups are considered: MSME, exporter, MSME exporter, and MSME nonexporter. Investment is highest among exporting firms, with MSME exporters showing greater investment levels than MSME non-exporters. MSME exporters also exhibit higher cash flow than other groups, while MSME non-exporters have the lowest cash flow. Exporting firms and MSME exporters have a higher share of the export ratio, confirming accurate categorization. Also, MSMEs and MSME exporters show a higher sales ratio than other groups, indicating efficient capital utilization.

Table 4 shows the correlation among investment, cash flow, export, and sales ratios. Cash flow, export, and sales ratios positively correlate with investment. The correlation between the sales ratio and investment is higher than that of cash flow, and the sales ratio also shows a stronger correlation with cash flow. The correlation of the export ratio with investment is lower compared to the cash flow and sales ratio.

Table 5 details the correlation of cash flow, export ratio, and sales ratio with investment across

different sample groups. The correlation between cash flow and investment is highest among exporters. In contrast, the correlation is weakest for MSME non-exporters. The export ratio is positively correlated with investment for but negatively correlated with exporters investment for MSMEs, MSME exporters, and MSME non-exporters. The correlation of sales with investment is higher for exporters compared to other groups, whereas it is lowest for MSME nonexporters. MSMEs often face liquidity constraints when a substantial portion of their sales is tied up in exports due to longer payment cycles, customs delays, and other barriers. This can result in cash flow problems, making it challenging for MSMEs to finance new investments, leading to a negative relationship between the export ratio and investment.

## **Stationarity Test of All Variables**

Table 6 presents the results of the stationarity tests for all variables used in the analysis. The Augmented Dickey-Fuller (ADF) test indicates that all variables are stationary at the 1% significance level. This suggests that the mean, variance, and autocorrelation are constant over time and across all cross-sections. This reduces the risk of spurious regression and leads to more reliable estimates and predictions.

Croups Wariables	INV		CF		EXP		SA	
Groups/variables	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev
All firm	0.017	0.042	0.727	0.143	0.785	0.730	1.109	0.174
MSME	0.016	0.043	0.725	0.152	0.688	0.738	1.122	0.190
Exporter	0.018	0.041	0.736	0.140	1.271	0.687	1.108	0.161
MSME exporter	0.017	0.041	0.738	0.147	1.254	0.708	1.126	0.177
MSME non-exporter	0.016	0.044	0.719	0.154	0.412	0.576	1.120	0.196

#### **Table 3:** Descriptive Statistics in Different Groups of Samples

Note: INV= Difference between the previous year's fixed assets (Gross fixed assets) and the current year's fixed assets (Gross fixed assets) divided by the previous year's fixed, CF=Profit after tax divided by capital (previous year fixed assets), EXP= Export to sale in percentage, SA= Sale divided by capital (previous year fixed assets).

#### Table 4: Correlation Matrix with VIF

Variable	INV	CF	EXP	SA
INV	1.000			
CF	0.269***	1.000		
EXP	0.028***	0.039***	1.000	
SA	0.305***	0.549***	0.060***	1.000
VIF	1.290	1.440	1.430	1.000

Note: INV= Difference between the previous year's fixed assets (Gross fixed assets) and the current year's fixed assets (Gross fixed assets) divided by the previous year's fixed, CF= Profit after tax divided by capital (previous year's fixed assets), EXP= Export to sale in percentage, SA= Sale divided by capital (previous year fixed assets), \*\*\*Significant at 1 percent levels.

Table 5: Correlation with Investment in Diff	fferent Groups
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Group/ Variables	CF	EXP	SA
MSME	0.267	-0.004	0.296
Exporter	0.291	0.030	0.331
MSME exporter	0.282	-0.006	0.322
MSME non-exporter	0.261	-0.005	0.283

#### Table 6: ADF Stationarity Test

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Variables	Without trend	P Value	With trend	P Value
INV	-140.065	0.000***	-132.836	0.000***
CF	-44.062	0.000***	-32.965	0.000***
EXP	-21.705	0.000***	-20.379	0.000***
SALE	-71.036	0.000***	-74.660	0.000***
LIQ	-42.262	0.000***	-39.100	0.000***
DIV	-49.178	0.000***	-40.824	0.000***
СОВ	-16.431	0.000***	0.195	0.000***

Note: INV= Difference between the previous year's fixed assets (Gross fixed assets) and the current year's fixed assets (Gross fixed assets) divided by the previous year's fixed assets, CF= Profit after tax divided by capital (previous year fixed assets), SA= Sale divided by capital (previous year fixed assets), TBQ = (Market Capitalization + borrowing)/Total Assets, LEV= Debt to Equity Ratio, LIQ = Ratio of current assets to total assets, DIV= Dividends paid as a percentage of profits after tax, COB= Interest payments to total outstanding borrowings of the firm. \*\*\*Significant at 1 percent levels.

# **Results and Discussion**

# The Role of Credit Constraints on Investment for Exporting Firms

Tables 7 through 9 indicate a positive association between cash flow (CF) and investment, significant at the 1% level across all models (Equation 1 - 5). This positive and significant investment cash flow sensitivity (ICFS) suggests that firms in the Indian manufacturing sector are facing credit constraints. This finding is consistent with several studies on the Indian manufacturing sector (32, 33). Other studies show that firms facing credit constraints reduce their investment (34-36). The investment cash flow sensitivity is seen for credit constraint firms in countries with underdeveloped capital markets (37).

Table 7: Base Model

# Credit Constraints Faced by Indian MSMEs and Exporters

Table 8 reveals that the interaction of cash flow with MSME (CF\*MSME) is negatively associated with investment at the 1% significance level (Equation 2). This suggests that MSMEs in the Indian manufacturing sector face significant credit constraints. Previous research supports the positive ICFS for small Indian firms due to credit constraints (38, 39). However, studies argue that ICFS is non-monotonic in terms of the degree of credit constraint (25-27). A study posits that negative ICFS occurs when firms face low cash flow, high growth opportunities, and are highly financially constrained (13).

In contrast, the interaction of cash flow with the export dummy (CF\*EXP) is positive but not statistically significant (Equation 3). This indicates that the ICFS for exporters is not significant, suggesting that exporters have better access to external funds and, therefore, do not face significant credit constraints. However, no studies have specifically examined the role of exports in mitigating credit constraints.

	Base Model: ICF	S (Equation 1)		
	Coef.	Std. Error	t-stat.	
INV (Lag 1)	0.076***	0.013	5.880	
CF	0.058***	0.022	2.580	
EXP	0.003	0.002	1.580	
SALE	0.070***	0.009	7.480	
LIQ	0.238*	0.139	1.710	
DIV	-0.032**	0.014	-2.320	
СОВ	0.028***	0.011	2.580	
CON	-0.394**	0.162	-2.430	
Year Dummies	YES			
No. of Obs.	25056			
No. of Group	1374			
F-stat.	37, 1373			
AR (2)	0.110			
Hansen	0.254			

Note: INV= Difference between the previous year's fixed assets (Gross fixed assets) and the current year's fixed assets (Gross fixed assets) divided by the previous year's fixed assets, CF= Profit after tax divided by capital (previous year fixed assets), EXP = export to sale ratio, SA= Sale divided by capital (previous year fixed assets), LIQ = ratio of current assets to total assets, DIV= Dividends paid as a percentage of profits after tax, COB= Interest payments to total outstanding borrowings of the firm. \*, \*\*, \*\*\*Significant at 10, 5, and 1 percent levels, respectively.

Table	8:	ICES	of	MSMEs	and	Exporters
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	ICFS of MSI	ME (Eq. 2)		ICFS of Exp	porter (Eq. 3)	
	Coef.	Std. Error	t-stat.	Coef.	Std. Error	t-stat.
INV (Lag 1)	0.074***	0.013	5.780	0.076***	0.013	5.840
CF	0.065***	0.024	2.740	0.057**	0.022	2.540
CF*MSME	-0.017***	0.005	-3.350			
CF*EXP				0.003	0.003	0.940
EXP	0.003*	0.002	1.650	0.002	0.002	1.210
SALE	0.077***	0.009	8.740	0.070***	0.009	7.530
LIQ	0.251*	0.141	1.770	0.233*	0.140	1.660
DIV	-0.035**	0.014	-2.470	-0.032**	0.014	-2.320
COB	0.024**	0.010	2.300	0.028**	0.011	2.550
CON	-0.403**	0.164	-2.470	-0.389**	0.163	-2.380
Year Dummies	YES			YES		
No. of Obs.	25056			25056		
No. of Group	1374			1374		
F-stat.	38, 1373			38, 1373		
AR (2)	0.160			0.108		

Hansen	0.289	0.249
Note: INV= Diffe	erence between previous year fixed assets (	Gross fixed assets) and current year fixed assets (Gross fixed assets) divided by previous year fixed
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assets, CF=Profit after tax divided by capital (previous year fixed assets), EXP = Export to sale ratio, SA= Sale divided by capital (previous year fixed assets), LIQ = Ratio of current assets to total assets, DIV= Dividends paid as a percentage of profits after tax, COB= Interest payments to total outstanding borrowings of the firm. MSME = dummy for MSME (1 for MSME and 0 otherwise), EXP is a dummy for exporting firm (1 for exporting firm and 0 otherwise). \*, \*\*, \*\*\*Significant at 10, 5 and 1 percent levels, respectively.

# Credit Constraints for MSME Exporters vs. MSME Non-Exporters

Table 9 shows that the interaction of cash flow with MSME exporters (CF\*MSME\*EXP) is negative but not statistically significant (Equation 4). This indicates that MSME exporters do not face significant credit constraints and can access external funds.

Conversely, the interaction of cash flow with MSME non-exporter (CF\*MSME\*NON\_EXP) is negative and significant at the 1% level (Equation 5). This finding suggests that MSME non-exporters face more severe credit constraints.

These results indicate that exporters do not face credit constraints, likely due to their stronger financial health and higher revenue from international markets, which enhances their creditworthiness with lenders. At the same time, MSME non-exporters cannot enter the export market due to credit constraints. As far as I understand, hardly any study has examined the role of credit constraint on investment in the case of MSME exporters and MSME non-exporting. However, some studies argue that asymmetric information significantly affects a firm's investment (40). Small firms face the problem of credit constraints due to asymmetric information issues in developing countries (5-10, 37). The study also supports the idea that vulnerable firms reduce their investment after a debt boom (34).

# The Role of Previous Investment on

## **Current Investment**

Previous investment shows a positive association with current investment, significant at the 1% level across all models (Equation 1 - 5). This suggests that previous investments encourage current investment, supporting the dynamic accelerator theory of investment (12). This finding is corroborated by previous studies (38, 39, 41).

The Influence of Exports on Investment

The ratio of exports ratio shows a positive association with investment. However, this relationship is insignificant in Models 1, 3, and 5 (Equation 1, 3, and 5). In Models 2 and 4 (Equation 2 and 4), this ratio is positively associated with investment at the 10% significance level. This suggests that exports or external demand have a weak influence on investment.

## The Impact of Sales on Investment

The sales ratio is positively associated with investment at the 1% significance level in all models (Equation 1 to 5). This supports the output theory or demand theory, indicating that higher sales or demand leads to increased investment. Several studies have found a positive relationship between sales and investment in the Indian market (18, 33, 42-44).

	ICFS of MSME Exporter			ICFS of MSME Non-Exporter				
	(Equation 4)			(Equation 5)				
	Coef.	Std. Error	t-stat.	Coef.	Std. Error	t-stat.		
INV (Lag 1)	0.076***	0.013	5.890	0.074***	0.013	5.810		
CF	0.058***	0.022	2.580	0.061***	0.023	2.690		
CF*MSME*EXP	-0.004	0.004	-0.990					
CF*MSME*NON_EXP				-0.012***	0.004	-3.070		
EXP	0.003*	0.002	1.690	0.001	0.001	0.860		
SALE	0.070***	0.009	7.590	0.074***	0.009	8.010		
LIQ	0.242*	0.139	1.730	0.234*	0.139	1.680		
DIV	-0.033**	0.014	-2.340	-0.033**	0.014	-2.390		
СОВ	0.028**	0.011	2.560	0.026**	0.011	2.460		
CON	-0.398**	0.162	-2.460	-0.388**	0.162	-2.400		
Year Dummies	YES			YES				

Table 9: ICFS of MSME Exporter and MSME Non-Exporter

No. of Obs.	25056	25056
No. of Group	1374	1374
F-stat.	38,1373	38,1373
AR (2)	0.113	0.131
Hansen	0.259	0.267

**Note:** INV= Difference between the previous year's fixed assets (Gross fixed assets) and the current year's fixed assets (Gross fixed assets) divided by the previous year's fixed assets, CF= Profit after tax divided by capital (previous year fixed assets), EXP = export to sale ratio, SA= Sale divided by capital (previous year fixed assets), LIQ = ratio of current assets to total assets, DIV= Dividends paid as a percentage of profits after tax, COB= Interest payments to total outstanding borrowings of the firm. MSME = dummy for MSME (1 for MSME and 0 otherwise), EXP is a dummy for exporting firm (1 for exporting firm and 0 otherwise). \*, \*\*, \*\*\*Significant at 10, 5, and 1 percent levels, respectively.

# The Effect of Other Factors on Investment

The liquidity ratio shows a positive association with investment at the 10% significance level across all models (Equation 1 - 5). Firms with higher liquidity tend to invest more, suggesting that greater liquidity reduces credit constraints. According to liquidity theory, a firm's liquidity reflects its internal funds, which are a primary source of finance (44).

The dividend is negatively associated with investment at the 5% significance level across all models (Equation 1 - 5). This indicates that firms prioritize investment over dividends, aligning with the static trade-off theory of capital structure. The previous study says that credit constraints can be identified by the low dividend payout ratio (20). This study found that Indian firms prioritize investment over dividends, which does not support the previous study.

The cost of borrowing has a positive association with investment at the 1% significance level in Model 1 (Equation 1) and the 5% significance level in Models 2 to 5 (Equation 2 - 5). Previous studies found that high interest rate reduces the investment because of the high cost of debt and low interest rate encourage the investment because of cheap cost of debt (20). This study does not support the previous research but rather the static trade-off theory of capital structure in the case of Indian firms.

# Conclusion

The performance of Indian manufacturing sector exports is poor. While existing literature has explored the impact of credit constraints on investment behavior among Indian manufacturing firms, it has largely overlooked the investment behavior of MSME and exporting firms. This study addresses this gap by examining the role of credit constraints faced by MSMEs and exporters on the investment of Indian manufacturing firms. Based on a sample of 1,412 BSE-listed manufacturing firms, the analysis employs the two-step GMM method and the investment cash flow sensitivity (ICFS) approach to assess credit constraints. The empirical results reveal that ICFS is positive and significant, indicating that Indian manufacturing firms face credit constraints. The study also finds that MSMEs experience significant credit constraints, as evidenced by a negative and significant ICFS. However, exporters' ICFS is insignificant, suggesting that exporters have better access to external funding. Moreover, the ICFS of MSME exporters is not significant, implying they can access external funds and do not face credit constraints. In contrast, MSME non-exporters face more severe credit constraints, as indicated by a negative and significant ICFS. The study further finds that previous investment positively influences current investment, supporting the dynamic accelerator theory. However, the effect of exports on investment is weak and does not fully support the output or demand theory. On the other hand, sales strongly influence investment, aligning with the output or demand theory. Other factors, such as liquidity ratio, dividend ratio, and cost of borrowing, also significantly affect investment. liquidity correlates with increased High investment, suggesting reduced credit constraints. The negative association between dividend ratio and investment indicates a preference for investment over dividends, while the positive relationship between borrowing costs and investment reflects the static trade-off theory. In summary, while Indian exporters in the manufacturing sector generally do not face significant credit constraints, MSMEs face

substantial challenges, particularly those that do not engage in export activities. To enhance the investment and export performance of Indian manufacturing, improving credit facilities for MSMEs is crucial. Given the substantial role of MSMEs in manufacturing, enhancing their investment capacity is essential for improving export performance. The government should focus on providing better credit facilities to boost investment and strengthen the export performance of the Indian MSME in the manufacturing sector. However, the study has a few limitations; for instance, this research does not account for macroeconomic factors. Future research could extend this analysis bv macroeconomic incorporating variables. particularly supply-side credit constraints. A comparative study, i.e., supply-side and demandside credit constraints, can be examined concerning investment in the Indian manufacturing sector.

## Abbreviations

ADF: Augmented Dickey-Fuller, BSE: Bombay Stock Exchange, CAD: Current Account Deficit, CMIE: Centre for Monitoring Indian Economy, GDP: Gross Domestic Product, GFCF: Gross Fixed Capital Formation, GMM: Generalized method of moments, ICFS: Investment Cash Flow Sensitivity, MSMEs: Micro, Small, and Medium Enterprises, RBI: Reserve Bank of India.

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## **Author Contributions**

The author confirms sole responsibility for the manuscript preparation.

#### **Conflict of Interest**

There is no conflict of interest associated with this study. This research is original and independent, not a part of any other studies.

#### **Ethics Approval**

The study does not require any ethics approval.

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## References

1. Melitz MJ. The impact of trade on intra-industry reallocations and aggregate industry productivity. Econometrica. 2003 Nov;71(6):1695-725.

- Liu Q, Lu Y. Firm investment and exporting: Evidence from China's value-added tax reform. Journal of International Economics. 2015 Nov 1;97(2):392-403.
- 3. Rho Y, Rodrigue J. Firm-level investment and export dynamics. International Economic Review. 2016 Feb;57(1):271-304.
- Modigliani F, Miller MH. The cost of capital, corporation finance and the theory of investment. The American Economic Review. 1958 Jun 1;48(3):261-97.
- Beck T, Demirgüç-Kunt AS, Maksimovic V. Financial and legal constraints to growth: does firm size matter? The journal of finance. 2005 Feb;60(1):137-77.
- 6. Forbes KJ. One cost of the Chilean capital controls: increased financial constraints for smaller traded firms. Journal of International Economics. 2007 Apr 1;71(2):294-323.
- Binks MR, Ennew CT. Growing firms and the credit constraint. Small Business Economics. 1996 Feb;8:17-25.
- 8. Stiglitz JE, Weiss A. Credit rationing in markets with imperfect information. The American Economic Review. 1981 Jun 1;71(3):393-410.
- Berger AN, Udell GF. Lines of credit and relationship lending in small firm finance. Working Paper No. 113. Annandale-on-Hudson, NY: Levy Economics Institute of Bard College; 1994. https://www.econstor.eu/bitstream/10419/18679 6/1/wp113.pdf
- 10. Berger AN, Udell GF. Relationship lending and lines of credit in small firm finance. Journal of business.1995;68(3):351-81. https://www.jstor.org/stable/2353332
- 11. Manova K. Credit constraints, equity market liberalizations and international trade. Journal of International Economics. 2008 Sep 1;76(1):33-47.
- 12. Chenery HB. Overcapacity and the acceleration principle. Econometrica. 1952 Jan; 20 (1):1-28. https://www.jstor.org/stable/1907804
- Hovakimian G. Determinants of investment cash flow sensitivity. Financial Management. 2009 Mar;38(1):161-83.
- 14. Aghion P, Angeletos GM, Banerjee A, Manova K. Volatility and growth: Credit constraints and the composition of investment. Journal of monetary economics. 2010 Apr 1;57(3):246-65.
- 15. Črnigoj M, Verbič M. Financial constraints and corporate investments during the current financial and economic crisis: The credit crunch and investment decisions of Slovenian firms. Economic Systems. 2014 Dec 1;38(4):502-17.
- 16. Garcia-Posada M. Credit constraints, firm investment and growth: evidence from survey data. ECB Working Paper No. 2126. Frankfurt: European Central Bank; 2018. https://papers.srn.com/sol3/papers.cfm?abstract\_ id=3116733
- 17. Nair P. Financial liberalization and determinants of investment: A study of Indian manufacturing firms. International Journal of Management of International Business and Economic Systems. 2011;5(1):121-33.
- 18. Bhardwaj P, Kumar A. Determinants of firm-level investment in India: does size matter?

Macroeconomics and Finance in Emerging Market Economies. 2020 May 3;13(2):140-60.

 Bhattacharyya S. Determinants of Private Corporate Investment: Evidence from Indian Manufacturing Firms. Proceedings of the Northeast Business & amp; Economics Association. 2007. https://research.ebsco.com/c/dfabsd/search/detai

ls/cak4r5tijr/details?db=bth 20. Jangili R, Kumar S. Determinants of private corporate sector investment in India. Reserve Bank of India Occasional Papers. 2010;31(3):67–89. https://mpra.ub.uni-muenchen.de/39839/

- 21. Bruinshoofd WA. Corporate investment and financing constraints: connections with cash management. Credit and Capital Markets–Kredit und Kapital. 2006 Jul;1(3):455-83.
- 22. Almeida H, Campello M, Weisbach MS. The cash flow sensitivity of cash. The journal of finance. 2004 Aug;59(4):1777-804.
- Clark JM. Business Acceleration and the Law of Demand: A Technical Factor in Economic Cycles. Journal of Political Economy. 1917 Mar;25(3):217– 35.

https://www.journals.uchicago.edu/doi/abs/10.10 86/252958

- 24. Fazzari SM, Hubbard RG, Petersen BC. Financing constraints and corporate investment. NBER Working Paper No. 2387. Cambridge, MA: National Bureau of Economic Research; 1987. Financing Constraints and Corporate Investment | NBER
- 25. Kaplan SN, Zingales L. Do investment-cash flow sensitivities provide useful measures of financing constraints? The quarterly journal of economics. 1997 Feb 1;112(1):169-215.
- Kaplan SN, Zingales L. Investment-cash flow sensitivities are not valid measures of financing constraints. The Quarterly Journal of Economics. 2000 May 1;115(2):707-12.
- 27. Cleary S. The relationship between firm investment and financial status. The journal of finance. 1999 Apr;54(2):673-92.
- 28. Cleary S, Povel P, Raith M. The U-shaped investment curve: Theory and evidence. Journal of financial and quantitative analysis. 2007 Mar;42(1):1-39.
- 29. Lawrenz J, Oberndorfer J. What drives negative investment-cash flow sensitivities? Revenue effect versus corporate life-cycle dynamics. Schmalenbach Journal of Business Research. 2023 Dec;75(4):483-518.
- 30. Arellano M, Bover O. Another look at the instrumental variable estimation of errorcomponents models. Journal of econometrics. 1995 Jul 1;68(1):29-51.

- 31. Blundell R, Bond S. Initial conditions and moment restrictions in dynamic panel data models. Journal of econometrics. 1998 Nov 1;87(1):115-43.
- 32. Altaf N, Shah FA. Investment and financial constraints in Indian firms: does working capital smoothen fixed investment? Decision. 2018 Mar;45:43-58.
- 33. Kumar S, Ranjani KS. Financial constraints and investment decisions of listed Indian manufacturing firms. Financial Innovation. 2018 Dec;4:1-7.
- 34. Albuquerque B. Corporate debt booms, financial constraints, and the investment nexus. Journal of Applied Econometrics. 2024 Aug;39(5):766-89.
- 35. Kim T, Lee BB, Paik DG. The relationship between financial constraints and investment efficiency. Journal of Corporate Accounting & Finance. 2025 Jan;36(1):61-80.
- Hatzinikolaou D, Hatzinikolaou D. Modeling aggregate investment under financial constraints. Empirical Economics. 2025 Feb;68(2):759-81.
- 37. Doruk ÖT. The investment-cash flow sensitivity and the financing constraints hypothesis for emerging markets: a bibliometric and systematic literature review. Journal of Business and Socio-economic Development. 2025 Apr 1;5(2):122-38.
- 38. Gupta G, Mahakud J. The impact of macroeconomic condition on investment-cash flow sensitivity of Indian firms: do business group affiliation and firm size matter? South Asian Journal of Business Studies. 2020 Feb 5;9(1):19-42.
- 39. Firth M, Malatesta PH, Xin Q, Xu L. Corporate investment, government control, and financing channels: Evidence from China's Listed Companies. Journal of Corporate Finance. 2012 Jun 1;18(3):433-50.
- 40. Abdeljawad I, Abu Alia M, Demaidi M. Financing constraints and corporate investment decision: evidence from an emerging economy. Competitiveness Review: An International Business Journal. 2024 Jan 17;34(1):208-28.
- 41. Tran NH, Le CD. Financial conditions and corporate investment: Evidence from Vietnam. Pacific Accounting Review. 2017 Apr 3;29(2):183-203.
- 42. Hosamane MD, Niranjan R. Determinants of investment pattern in Indian manufacturing industries a panel data study. Indian Journal of Economics & Business. 2010 Mar 1;9(1):207-18.
- 43. Rahim AA. Internal funds and investment financing by Indian manufacturing firms. Indian Journal of Economics and Development. 2017 Jun 30;5(6):1-9.
- 44. Sahoo P, Bishnoi A. Drivers of corporate investment in India: The role of firm-specific factors and macroeconomic policy. Economic Modelling. 2023 Aug 1;125:106330.