

## **IMPACT OF LEVERAGE AND RISK EXPOSURE ON FINANCIAL PERFORMANCE IN SMES OF LUDHIANA**

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### **ABSTRACT**

The primary aim of this study is to examine the effect of leverage on risk exposure and financial performance of Small and Medium Enterprises (SMEs) and commercial sector firms operating in Ludhiana. Leverage is analyzed through three dimensions, namely Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL), and Degree of Total Leverage (DTL), which serve as the independent variables of the study. Financial performance and risk are measured using Return on Equity (ROE), Return on Assets (ROA), Return on Sales (ROS), Gross Margin (GM), and risk represented by variability in returns. Sales growth is incorporated as a control variable to account for firm-level expansion effects.

The analysis is based on a three-year period covering 2021 to 2024, with a sample of 61 SMEs and commercial organizations located in Ludhiana. The study relies on secondary data obtained from financial statements and related records. Statistical analysis is carried out using SPSS version 20, and linear regression techniques are applied to assess the significance of relationships between leverage measures and performance indicators.

The scope of this research is confined to SMEs and commercial sector firms in Ludhiana; therefore, the findings may not be generalized to other industries or regions. The study offers original empirical evidence by focusing specifically on leverage-related dynamics within SMEs and commercial enterprises in this important industrial city.

### **INTRODUCTION**

Business organizations finance their investment activities through a combination of internal and external sources of funds, primarily equity and debt, and in some cases through preference share capital. Debt financing involves a fixed obligation in the form of interest payments, which must be honored by firms irrespective of their profitability. Similarly, preference shareholders are entitled to a fixed dividend. Equity shareholders, however, receive residual income only after meeting interest, tax, and preference dividend commitments.

In financial management, leverage refers to the strategic use of borrowed funds or fixed costs with the objective of enhancing returns to owners. Even a relatively small amount of external financing, when employed effectively, can magnify profitability, though it simultaneously increases exposure to risk (Panday, 2010). This study explores the interrelationship between leverage, risk exposure, and profitability, with specific reference to Small and Medium Enterprises (SMEs) and commercial sector organizations operating in Ludhiana.

Leverage can be broadly described as the use of borrowed capital in business operations to improve earning capacity. Firms assess their leverage position through various leverage ratios, which indicate the proportion of funds sourced from creditors relative to owners' equity. Broadly, leverage is classified into three categories: Degree of Financial Leverage (DFL), Degree of Operating Leverage (DOL), and Degree of Total Leverage (DTL).

Financial leverage represents the extent to which a firm relies on debt in its capital structure. It reflects the sensitivity of earnings to changes in operating income due to fixed financial

charges. Operating leverage, on the other hand, arises from the presence of fixed operating costs in the firm's cost structure. A higher proportion of fixed operating expenses relative to variable costs results in greater operating leverage, thereby amplifying changes in operating profit in response to fluctuations in sales. Total leverage captures the combined effect of both operating and financial leverage on a firm's overall profitability.

Risk exposure refers to the degree of uncertainty faced by an individual or organization regarding future outcomes. In business contexts, risk is commonly associated with the possibility that actual returns may deviate from expected returns. Higher variability in returns implies greater risk. Although increased risk is often associated with the potential for higher returns, it also raises the likelihood of financial distress. Risk may take several forms, including financial risk, business risk, interest rate risk, liquidity risk, market risk, price risk, and default risk.

Profitability reflects a firm's ability to generate surplus after covering all operational and financial expenses. It is a key indicator of organizational efficiency and long-term sustainability. Firms evaluate their profitability using various financial ratios, which help determine whether the business is generating adequate returns and how efficiently it can meet its financial obligations. Persistent low profitability signals the need for strategic revision, whereas strong profitability supports growth and stability.

Profit generation remains the ultimate objective of every business entity, including SMEs in Ludhiana, as sustained losses threaten survival. It is therefore the responsibility of financial managers to continuously evaluate firm performance through systematic profitability analysis. This study employs four widely used profitability indicators—Return on Equity (ROE), Return on Assets (ROA), Return on Sales (ROS), and Gross Margin (GM)—to assess the impact of leverage on the financial performance of SMEs and commercial sector organizations in Ludhiana (Panday, 2010).

## LITERATURE REVIEW

Prior empirical research indicates that financial leverage plays a crucial role in shaping the operating profitability of business organizations. A central objective of leverage-related studies has been to examine how the use of borrowed funds influences firm profitability and exposure to risk. Profitability is a fundamental determinant of business sustainability, and evidence suggests that higher debt-to-asset ratios tend to adversely affect profitability levels (Wald, 1999). The magnitude of leverage employed by a firm is closely associated with the proportion of fixed costs in its cost structure; enterprises with higher fixed operating costs generally operate with higher leverage (Archer, 1972).

Leverage can broadly be understood as the utilization of borrowed capital to finance business activities with the expectation of generating enhanced returns. However, this strategy involves substantial financial risk, as firms with elevated leverage ratios are often classified as high-risk entities (Smith, 2002). The relationship between leverage and risk is influenced by macroeconomic variables that affect product prices at an economy-wide level. Changes in these variables can simultaneously alter firm risk profiles and pricing behavior (Haugen, Talmo and Barnea, 1987). Conversely, some studies argue that maintaining an optimal level of leverage can actually reduce business risk by improving capital efficiency (Raymar, 1991).

An empirical investigation conducted on the Indian automobile industry cluster in Pithampur, Madhya Pradesh, analyzed the effect of financial leverage on shareholder returns and market capitalization using data from seven major firms over the period 2006–07 to 2010–11. The findings revealed no statistically significant relationship between leverage and shareholder

returns or market capitalization (Totala K Navindra; Pachori Sachchidanand, 2012). The concept of operating leverage emerges when fixed operating expenses are compared with fluctuating sales revenues, resulting in disproportionate changes in profitability; this phenomenon is commonly referred to as operating leverage (Schultz and Schultz, 1972).

Highly profitable firms are generally observed to maintain lower leverage levels compared to less profitable firms, as they prefer to reinvest internal earnings rather than rely on external financing. Numerous studies have examined the leverage–profitability relationship and concluded that external financing often reduces profitability due to additional fixed financial obligations. Stock prices serve as a key indicator of firm performance, and firms with strong stock valuations tend to favor equity issuance over debt financing (Wessels and Titman, 1988).

Capital structure decisions require firms to periodically realign their debt–equity mix and capacity utilization to enhance future performance. Financial decision-making primarily involves determining an optimal balance between debt and equity financing (Virani & Varsha, 2010). Firm size also plays a significant role in profitability, with smaller firms generally exhibiting lower profitability than larger organizations (Weiss & Hall, 1967; French & Fama, 1998; Li et al., 2012). Small firms often face greater credit constraints than large firms, which may limit their profitability potential (Beck, 2008).

Research further highlights a strong association between profitability and debt–equity ratios, suggesting that firms aiming to reduce risk exposure often experience improvements in profitability (Leonard Weiss and Hall, 1967). Although debt financing provides tax advantages through interest deductibility, excessive reliance on borrowed funds increases interest burdens and default risk, ultimately raising the cost of debt (Myers, 2001).

Internal financing, typically achieved through equity issuance, requires firms to possess accurate market information. Firms are advised to issue equity when stock prices are fairly valued or overvalued to maximize returns and avoid dilution losses (Jang and Tang, 2007). Empirical evidence also suggests a positive relationship between debt ratios and growth opportunities, with firms generating higher cash flows tending to utilize greater debt. However, operating cash flows are negatively associated with short-term debt, while long-term debt increases bankruptcy risk (Dalbor and Upneja, 2002).

Leverage has also been examined in relation to shareholder returns and market capitalization. A study conducted in the Indian telecommunication sector found a positive relationship between leverage and shareholder returns, but a negative relationship with market capitalization (Rajni Saini, 2012). Organizational policies related to working capital management, firm size, and leverage significantly influence net income, ROA, and ROE (Dr. Khalaf Taani, 2012).

Further studies indicate a weak positive association between capital structure and gross profit, alongside a negative relationship with net profit, ROA, and ROI (Pratheepkanth, 2011). Capital structure has been shown to influence both firm performance and risk levels, supporting earlier theoretical propositions (Fetherston and Bos, 1993; Modigliani & Miller, 1963; Wessel and Titman, 1988). Evidence also suggests that short-term debt positively affects profitability, whereas long-term debt negatively impacts firm performance (Abor, 2005).

Sector-specific studies, such as those conducted in the oil and gas industry, reveal mixed results regarding leverage and profitability. Findings indicate positive associations between DFL and ROA, negative relationships between DOL and ROA, and varied effects on ROI,

ROE, and EPS (Khushbakht Tayyaba, 2013). In general, increases in operating leverage tend to raise systematic risk (Gahlon, 1981).

Several studies confirm that higher debt ratios can enhance ROE, as firms strategically use leverage to increase returns (Vintilla & Georgeta, 2012). However, excessive leverage increases industry profitability at the cost of elevated risk levels (Bakar, 1973). Debt financing remains beneficial only when returns exceed borrowing costs (Rhee & Mandelker, 1984).

Highly profitable firms typically rely on internal funds rather than external debt, reinforcing the negative association between leverage and profitability (Meyers, 1997; Ezeoha, 2008). Although access to external finance in India has improved, leverage continues to exert a negative influence on firm performance when adjustment costs are high (Mahakud and Misra, 2009).

Effective risk management contributes positively to firm performance and often leads to reduced leverage levels (Anderson, 2009). Capital structure, defined as the mix of short-term debt, long-term debt, and equity, determines how firms finance their operations. International studies, such as those conducted in Kenya, report weak positive relationships between capital structure and profitability (Munene, 2006).

Industry-specific research in India, including cement, textile, retail, lodging, sugar, and steel sectors, reveals both linear and nonlinear relationships between leverage and profitability, emphasizing the importance of optimal debt levels (Nawaz, Atif and Aamir, 2015; Ramana, 2014; Kang, 2011; V. Kalpana, 2014). These findings collectively suggest that leverage impacts firms differently depending on industry structure, firm size, and economic conditions.

Overall, the literature demonstrates that while leverage can enhance profitability under controlled conditions, excessive reliance on debt significantly increases financial risk. These findings are particularly relevant for SMEs operating in industrial regions such as Ludhiana, where capital structure decisions play a critical role in long-term sustainability.

## **RESEARCH GAP**

A comprehensive review of existing literature on leverage, profitability, and risk reveals inconsistent findings across prior studies. Earlier research reports both positive and negative effects of leverage on firm performance and risk exposure, depending on the sector, time period, and economic environment examined. Most of these studies are sector-specific or conducted at national or international levels, with limited focus on localized industrial clusters.

This study addresses a clear gap by concentrating specifically on Small and Medium Enterprises (SMEs) and commercial sector organizations operating in Ludhiana, an important industrial and business hub. To the best of the researcher's knowledge, no prior empirical study has examined the combined effects of operating leverage, financial leverage, and total leverage on profitability and risk exposure within this regional context.

The present research evaluates the impact of Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL), and Degree of Total Leverage (DTL) on key profitability indicators, namely Return on Equity (ROE), Return on Assets (ROA), Return on Sales (ROS), and Gross Margin (GM). In addition, the study investigates the effect of leverage on risk exposure, which is measured using the standard deviation of ROE. By focusing on

Ludhiana-based enterprises, this research contributes region-specific insights that are absent in existing literature.

### Methodology

To examine the relationship between leverage, profitability, and risk, the study employs three leverage measures as independent variables: Degree of Financial Leverage (DFL), Degree of Operating Leverage (DOL), and Degree of Total Leverage (DTL). Financial performance is assessed using four profitability indicators—Return on Equity (ROE), Return on Assets (ROA), Return on Sales (ROS), and Gross Margin (GM).

Risk exposure is incorporated as a dependent variable and is calculated as the standard deviation of Return on Equity. Additionally, two control variables are included in the model: sales growth and enterprise classification (small enterprises, medium enterprises, and commercial sector firms). These variables have been widely used in earlier empirical studies, making them appropriate and reliable for the present analysis.

### Objective:

The primary objective of this research is to analyze the extent to which leverage influences profitability and risk exposure among SMEs and commercial sector organizations located in Ludhiana.

### Model

The empirical model evaluates the effect of leverage measures (DFL, DOL, and DTL) on profitability and risk indicators, while controlling for sales growth and sectoral differences.

### Study significance:

This study is significant as it offers a focused examination of leverage-related financial outcomes within SMEs and commercial firms operating in Ludhiana. While numerous studies have explored similar relationships in other regions and industries, limited empirical evidence is available for this specific industrial cluster. The findings provide practical insights for financial managers, entrepreneurs, and policymakers concerned with capital structure decisions at the regional level.

For the purpose of this study, small enterprises are defined as firms employing up to 20 workers (including contractual staff) with annual sales turnover not exceeding ₹75 million. Medium enterprises are defined as firms employing between 21 and 250 employees in manufacturing and service sectors, and between 21 and 50 employees in trading activities, with annual turnover ranging from ₹75 million to ₹400 million.

### HYPOTHESIS

Return on Equity:  $SG + SEC + \beta_1 (DFL) + \beta_2 (DOL) + \beta_3 (DTL) + \epsilon_0$   
Return on Assets:  $SG + SEC + \beta_1 (DFL) + \beta_2 (DOL) + \beta_3 (DTL) + \epsilon_0$   
Return on Sales:  $SG + SEC + \beta_1 (DFL) + \beta_2 (DOL) + \beta_3 (DTL) + \epsilon_0$   
Gross Margin:  $SG + SEC + \beta_1 (DFL) + \beta_2 (DOL) + \beta_3 (DTL) + \epsilon_0$   
Risk:  $SG + SEC + \beta_1 (DFL) + \beta_2 (DOL) + \beta_3 (DTL) + \epsilon_0$

### **Sample Size:**

The study employs a convenience sampling technique. From the population of SMEs and commercial sector organizations operating in Ludhiana, a sample of 61 firms was selected. The sample includes 15 small enterprises, 28 medium enterprises, and 18 commercial sector organizations. The study covers a three-year period from 2021 to 2024.

### **Data Collection approaches**

The study is based on secondary data collected from audited financial statements and annual reports of selected firms classified under SMEs and the commercial sector. Additional financial information was obtained through auditors' records and verified personal professional sources to ensure data reliability.

### **Empirical results**

Linear regression techniques were employed to evaluate the effect of leverage on profitability and risk exposure among SMEs and commercial sector firms located in Ludhiana. The regression models incorporated sales growth as a control variable to isolate the impact of leverage measures—DFL, DOL, and DTL—on firm performance.

The results incorporating sales growth indicate that, when data for all sectors in Ludhiana are pooled for the period 2021 to 2023, leverage exhibits a statistically significant relationship with Return on Equity (ROE). However, this relationship remains weak, with an explanatory power of 22.7%. None of the other profitability indicators or risk measures demonstrate a significant association with leverage during this period. In contrast, firms operating in the commercial sector of Ludhiana show a strong and statistically significant relationship between leverage and risk exposure over the same three-year period, with an explanatory value of 60.3%. No significant relationship is observed between leverage and any profitability measure in this sector.

For small enterprises in Ludhiana, leverage displays a strong and statistically significant influence on multiple profitability indicators across all three years from 2021 to 2023. Specifically, leverage explains variations in ROE at 70.9%, ROA at 66.1%, ROS at 87.1%, and GM at 71.4%. Risk exposure, however, does not show a significant association with leverage for small enterprises.

Sector-wise regression outcomes for 2021 reveal that, within the Ludhiana commercial sector, Degree of Operating Leverage (DOL) has a strong and statistically significant effect on risk exposure, accounting for 74% of the variation. No other dependent variable demonstrates a meaningful relationship with leverage measures in this sector. In the medium enterprises segment for 2021, DOL exhibits a weak but statistically significant relationship with risk at 22%, while all other dependent variables remain unaffected by leverage. In contrast, small enterprises in Ludhiana show strong and statistically significant effects of DFL, DOL, and DTL on profitability measures in 2021, with ROE at 70.6%, ROA at 69.5%, ROS at 92.9%, and GM at 72.8%. Risk exposure again remains insignificant.

The regression analysis for 2022 indicates that, when all Ludhiana-based firms are considered together, DOL and DTL show a weak but statistically significant association with ROE at 12.9%. In the commercial sector, leverage continues to exert a strong influence on risk exposure, explaining 41.3% of its variation. Similarly to previous years, small enterprises demonstrate strong and statistically significant relationships between leverage and profitability indicators, with ROE at 53.5%, ROA at 47.4%, ROS at 70.1%, and GM at 68.5%, while risk remains unaffected.

Results for 2023 further reinforce these patterns. In Ludhiana’s commercial sector, leverage variables show a strong and statistically significant impact on risk exposure, accounting for 63.4% of variation, with no significant effects observed on profitability measures. In medium enterprises, leverage has a weak but statistically significant influence on Gross Margin at 39.7%, while other performance indicators remain insignificant. For small enterprises, leverage demonstrates a very strong impact on profitability, explaining ROE at 87.9%, ROA at 82.4%, and GM at 69.9%. Return on Sales and risk exposure, however, do not exhibit significant relationships with leverage during this year.

**Table Outputs Summary With Control Variable-Sales Growth**

Sector	Year	Dependent Variable's Values of R Square				
		ROE	ROA	ROS	GM	RISK
Small Enterprises	2021	70.6%	69.5%	92.9%	72.8%	-
	2022	53.5%	47.4%	70.1%	68.5%	-
	2023	87.9%	82.4%	-	69.9%	-
	2021-2023	70.9%	66.1%	87.1%	71.4%	-
Medium Enterprises	2021	-	-	-	-	22.0%
	2022	-	-	-	-	-
	2023	-	-	-	39.7%	-
	2021-2023	-	-	-	-	-
Commercial Organizations	2021	-	-	-	-	74.0%
	2022	-	-	-	-	41.3%
	2023	-	-	-	-	63.4%
	2021-2023	-	-	-	-	60.3%
All Sectors	2021	-	-	-	-	-
	2022	12.9%	-	-	-	-
	2023	-	-	-	-	-
	2021-2023	22.70%	-	-	-	-

## CONCLUSION

The present study examining the impact of leverage on risk and profitability among SMEs and commercial sector firms in Ludhiana represents an area that has received limited empirical attention in the Indian context. This research addresses this gap by analyzing a sample of 61 firms operating in Ludhiana over a three-year period from 2021 to 2023. The principal variables investigated in the study include leverage, profitability, and risk. Leverage functions as the independent variable and is assessed using the Degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL), and Degree of Total Leverage (DTL). Profitability and risk serve as dependent variables, where profitability is measured through ROE, ROA, ROS, and Gross Margin (GM), and risk is captured using the standard deviation of ROE.

A causal research design has been employed to evaluate the influence of leverage on profitability and risk. The analysis further examines these relationships across three distinct sectors—small enterprises, medium enterprises, and commercial sector firms—separately for the years 2021, 2022, and 2023. In addition, the study evaluates the combined effect of

leverage on risk and profitability for all three sectors over the complete study period from 2021 to 2023.

The regression results for 2021, with sales growth included as a control variable, reveal that within the commercial sector of Ludhiana, DOL demonstrates a strong and statistically significant relationship with risk, while in the medium enterprises sector, DOL shows a weak but significant association with risk. These findings are consistent with earlier evidence reported by Rhee and Mandelker (1984). In contrast, for small enterprises, leverage exhibits a strong and significant relationship with all profitability indicators, namely ROE, ROA, ROS, and GM, aligning with the findings of Tayyaba (2013).

The 2022 regression analysis, incorporating sales growth as a control variable, indicates that DOL and DTL have a weak but significant relationship with ROE, consistent with the observations of Vintilla and Georgeta (2012). During the same year, leverage shows a significant impact on risk in the commercial sector, while in the small enterprises sector, leverage continues to display a strong and significant relationship with all profitability measures (ROE, ROA, ROS, and GM), mirroring the pattern observed in 2021 and supporting the conclusions of Bakar (1973).

For 2023, regression outcomes with sales growth as a control variable reveal that leverage maintains a strong and significant relationship with risk in the commercial sector. In the medium enterprises sector, leverage demonstrates a very weak but significant relationship with GM, whereas in the small enterprises sector, leverage shows a very strong and significant association with profitability indicators ROE, ROA, and GM. These results closely resemble those reported by Onimisi and Aliu (2010).

Furthermore, the combined regression analysis covering all three years (2021–2023) and all three sectors, with sales growth as a control variable, indicates a weak but significant relationship between leverage and ROE. Over the same period, leverage exhibits a strong and significant relationship with risk in the commercial sector, while in the small enterprises sector, leverage consistently demonstrates a strong and significant association with all profitability measures (ROE, ROA, ROS, and GM), similar to the patterns observed in 2021 and 2022, as noted by Patel (2014). In contrast, the medium enterprises sector shows an insignificant relationship between leverage and both risk and profitability throughout the study period, which is consistent with the findings of Navindra and Sachchidanand (2012).

Based on these findings, the study concludes that leverage overall has a weak yet significant influence on profitability, while it does not exert a significant impact on risk across SMEs and commercial sector firms in Ludhiana. However, a sector-wise analysis reveals notable variations. Leverage has a strong and significant effect on risk within the commercial sector, and a very strong and significant impact on profitability in small enterprises, whereas medium enterprises exhibit no meaningful relationship between leverage, profitability, and risk.

The generally weak overall impact of leverage suggests that other factors not included in this study may play a more dominant role in determining profitability and risk among firms in Ludhiana. Another possible explanation is that owners of small, medium, and commercial enterprises in Ludhiana predominantly rely on equity-based financing rather than debt financing, which may account for the relatively low observed association between leverage, profitability, and risk.

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