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An Empirical Assessment of COVID-19's Impact on the Financial Performance of Small-Cap Pharmaceutical Companies in India

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Abstract
The COVID-19 pandemic, an unprecedented global health and economic crisis, profoundly disrupted businesses across the world, including India's crucial pharmaceutical sector. While large pharmaceutical multinationals have dominated pandemic-era research and policy attention, there has been comparatively little empirical work on Small and Medium Enterprises (SMEs), which constitute the backbone of India's pharmaceutical manufacturing capacity. This study seeks to fill this gap by analysing the impact of COVID-19 on the financial performance of three representative Indian pharmaceutical SMEs—Jagsonpal Pharmaceuticals Ltd, FDC Ltd, and Lincoln Pharmaceuticals Ltd—through rigorous pre-pandemic (2017–2019) and post-pandemic (2020–2022) financial analysis. Adopting a descriptive and comparative research design, the paper leverages secondary data sourced from company annual reports, stock exchange filings, and verified financial databases. Key financial performance indicators—profitability (Net Profit Margin, Return on Equity, Return on Assets), liquidity (Current Ratio, Quick Ratio), and solvency (Debt-to-Equity Ratio)—were calculated and compared over the study periods. Statistical validation was performed using paired t-tests to assess the significance of pre- and post-pandemic changes. The conceptual framework draws upon theories of SME resilience, particularly the Resource-Based View and Dynamic Capabilities Theory, to interpret results beyond simple ratio movement. Findings reveal that, although all three SMEs exhibited improved profitability, stronger liquidity, and reduced leverage following the pandemic, these changes were not statistically significant at the 5% confidence level. The patterns suggest that strategic cost management, operational restructuring, and diversification of supply chains—rather than the direct effects of the pandemic—were key drivers of financial improvement. Jagsonpal's marked recovery is linked to internal financial controls and product realignment, while Lincoln's stability derives from cash management and rapid debt reduction. The research underscores the need for targeted policy support, digital transformation incentives, and indigenous API development to secure India's pharmaceutical supply chain and export competitiveness in a post-pandemic world.

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1. Introduction

1.1 Background and Context

Financial performance is a multi-dimensional construct used to evaluate how efficiently and effectively an enterprise uses its resources to generate growth, profits, and sustainable shareholder value. Core financial performance metrics—profitability, liquidity, solvency, efficiency, and valuation—provide stakeholders with insight into a firm's operational health, strategic decision-making, and competitive position in the market (Gautam & Madhavi, 2024) [3].

For the pharmaceutical sector, financial performance is both an indicator of corporate success and a barometer of the health of the broader economy.

Pharmaceuticals are uniquely positioned in that they operate at the intersection of industrial manufacturing, public health, and global trade. In India—a key player in the global supply of generic medicines—the sector is not just an industry vertical but a national strategic asset.

Small and Medium Enterprises (SMEs) form the backbone of India's pharmaceutical ecosystem. Representing an estimated 35–40% of the total pharmaceutical market share, SMEs specialise in producing affordable generic medications, Active Pharmaceutical Ingredients (APIs), and niche therapeutic formulations. These companies also provide employment to hundreds of thousands, contribute substantially to export revenues, and improve the accessibility of essential medicines in underserved markets (Ministry of MSME, 2024) [6].

1.2 The Covid-19 Shock To Smes

The COVID-19 pandemic, emerging in late 2019, disrupted virtually every segment of the global economy. For pharmaceutical SMEs, the challenge was paradoxical. On one hand, demand surged for COVID-related products—immunity boosters, antivirals, antibiotics, oxygen-related devices—creating opportunities for revenue spikes. On the other hand, supply chain disruptions, raw material shortages (particularly APIs from China), rising production costs, and abrupt changes in demand for non-COVID drugs placed unprecedented pressure on operations (Chandna *et al*., 2022; Vyas *et al*., 2020) [2, 11].

India's dependence on China for over 70% of its bulk drug and API requirements magnified the vulnerability (Vyas *et al*., 2020) [11]. Lockdowns in both countries halted shipments, increased input costs, and left many SMEs scrambling for alternative suppliers. Simultaneously, changes in healthcare consumption—deferrals of elective procedures, shifts toward telemedicine, and new safety protocols—further complicated demand forecasting and cash flow management.

1.3 Smes In The Indian Pharmaceutical Sector

SMEs in India are classified under the Ministry of Micro, Small, and Medium Enterprises (Ministry of MSME, 2024) [3]. based on investment and turnover thresholds. For pharmaceuticals, most SMEs fall into the small or medium category, with significant variation in export orientation, therapeutic specialisation, and degree of vertical integration.

Their role in the pharmaceutical sector is distinctive:

- Manufacturing APIs domestically to reduce import dependency.
- Producing low-margin, high-volume generics that serve both domestic and export markets.
- Providing custom formulations for niche markets ignored by larger firms.
- Operating in geographically dispersed facilities that promote regional employment.
- Still, SMEs often face capital constraints, credit access challenges, and limited bargaining power in global markets—making them particularly susceptible to global supply shocks like COVID-19 (Lahkar *et al*., 2023) [5].

1.4 Literature Insights

Existing studies provide partial evidence on pandemic impacts:

- (Bhavyasri & Mohapatra, 2022) [1]. showed differential pandemic effects even among large pharma firms, suggesting that company-specific strategies matter as much as sectoral trends.
- (Smith, 2024) [10] found that SMEs with digitalised supply chains fared better, underscoring the role of technology adoption.
- (Khurana *et al*., 2024) [4]. observed varying pandemic impacts across industries, with healthcare sectors showing relative resilience.
- Notably, most studies focus on large corporations or industry averages, leaving a research gap in empirical SME-focused financial analysis.

1.5 Theoretical Frameworks

Two complementary lenses frame this study

1. Resource-Based View (RBV) – Firms with valuable, rare, inimitable, and non-substitutable resources (e.g., specialised formulations, skilled R&D teams, long-standing export contracts) can sustain competitive advantage during crises. In this study, SME resilience is partly explained by unique capabilities such as niche product portfolios and loyal distribution networks.
2. Dynamic Capabilities Theory – Beyond resource possession, SMEs need the ability to reconfigure, integrate, and adapt those resources quickly in a turbulent environment. SMEs that diversified their suppliers, embraced digital platforms, or realigned their product mixes during COVID-19 illustrate this adaptability.

1.6 Research Gap and Problem Statement

Despite the central role of SMEs in India's pharmaceutical supply chain, there is no extensive, statistically validated, ratio-based comparative study examining the pre- and post-COVID performance of SMEs specifically. The lack of such evidence limits policymakers' and investors' ability to target support and assess resilience strategies.

Problem Statement: An Empirical Assessment of COVID-19's Impact on the Financial Performance of Small-Cap Pharmaceutical Companies in India

1.7 Objectives

1. To analyse shifts in profitability, liquidity, and solvency among selected Indian pharmaceutical SMEs before and after COVID-19.
2. To statistically evaluate observed changes using paired t-tests.
3. To interpret results through strategic resilience and resource-based theories.
4. To provide actionable recommendations for SME managers, policymakers, and investors.

1.8 Significance of the Study

This study offers several noteworthy contributions. First, it furnishes empirical evidence that may guide the formulation of pharmaceutical policies tailored to the needs of small and medium-sized enterprises (SMEs). Second, it advances the theoretical discourse by elucidating the relationship between

financial performance and strategic management frameworks. Third, it generates contextually relevant insights to assist SME managers in effectively navigating and adapting to post-crisis business environments.

2. Methodology

2.1 Research Design

This study adopts a descriptive-comparative research design, which is appropriate when the objective is to observe, describe, and compare measurable variables without manipulating them (Saunders *et al*., 2019) [9]. In the context of financial performance analysis, this design enables the systematic evaluation of key profitability, liquidity, and solvency ratios before and after an external event—in this case, the COVID-19 pandemic.

The choice of a quantitative approach stems from the nature of the research variables. Financial ratios are numerical indicators derived from audited financial statements, lending themselves to statistical analysis and cross-period comparisons. This approach ensures objectivity, as calculations are based on verifiable and publicly available figures rather than subjective assessments.

Additionally, a comparative element was built into the design by segmenting the study into two periods:

- Pre-pandemic: Financial years 2017–2019
- Post-pandemic: Financial years 2020–2022

This temporal division allows the measurement of shifts in financial performance attributable to operational and market responses during and after the pandemic onset.

2.2 Sampling and Case Selection

- Sampling Unit
- The research focuses on Small and Medium Enterprises (SMEs) operating in the Indian pharmaceutical sector. According to the 2020 MSME classification in India, SMEs are categorised based on investment limits and annual turnover; the selected companies fall under either the Small or Medium classification.
- Selection Method
- A purposive sampling technique was applied for the following reasons:
- Relevance to industry trends – The chosen firms each represent significant yet distinct sub-segments of the SME pharmaceutical market (e.g., generics, APIs, niche formulations).
- Availability of reliable financial data – Only publicly listed SMEs on BSE and/or NSE with consistent financial disclosures for the study period were considered.
- Established market presence – The companies have long operational histories and recognisable market positions, making them appropriate case exemplars.
- Sample Size
- The sample consists of three SMEs:
- Jagsonpal Pharmaceuticals Ltd
- FDC Ltd
- Lincoln Pharmaceuticals Ltd
- While three may seem a modest number, in ratio-based trend analysis of SMEs, depth of firm-specific study often outweighs breadth, especially when data integrity and comparability are prioritised (Yin, 2018) [12].

2.3 Variables and Ratio Selection

The selection of financial ratios was guided by scholarly consensus on the most informative indicators for corporate financial health (Gibson, 2013):

1. Profitability Ratios – Measure earnings generation capability:

2. Net Profit Margin (NPM) = Net Income ÷ Sales × 100

3. Return on Equity (ROE) = Net Income ÷ Shareholder Equity × 100

4. Return on Assets (ROA) = Net Income ÷ Total Assets × 100

5. Liquidity Ratios – Assess the firm's ability to meet short-term commitments:

a. Current Ratio = Current Assets ÷ Current Liabilities

b. Quick Ratio = (Current Assets − Inventory) ÷ Current Liabilities

6. Solvency Ratio – Evaluates long-term debt servicing capacity:

a. Debt-to-Equity Ratio (DER) = Total Liabilities ÷ Shareholder Equity

7. These ratios were chosen to triangulate operational efficiency, resource utilisation, and risk exposure in both study periods.

2.4 Data Collection and Sources

The study relies exclusively on secondary data to ensure accuracy, timeliness, and accessibility. Sources include:

- Official annual reports and audited financial statements of each company.
- Public disclosures to BSE/NSE.
- Verified financial databases such as Money Control and Screener. in.
- Industry publications and MSME sector reports for contextual data.

2.5 Data Analysis Approach

The analysis follows a three-stage process:

1. Ratio Computation: All variables were computed consistently across firms and years to maintain comparability.
2. Comparative Analysis: Mean values for pre- and post-pandemic periods were compared to identify the direction and magnitude of changes.
3. Statistical Testing: The paired t-test was employed to evaluate whether observed differences in ratios between the two periods were statistically significant.

2.6 Statistical Procedure: Paired t-test Justification

- The paired t-test is appropriate when:
- The same entity (company) is measured at two different times.
- The aim is to determine whether the mean of the differences between paired observations is significantly

different from zero.
- Given that each company's ratio is compared between pre- and post-pandemic periods, the paired t-test meets the research design's requirements and controls for inter-company variability by focusing on within-company changes.

2.7 Reliability and Validity Considerations
- Reliability: Data were extracted from audited financial reports, ensuring high dependability. Cross-verification from multiple reputable databases mitigated transcription errors.
- Validity: The period selection ensures that findings reflect sustained rather than short-lived financial effects. However, causality is interpreted cautiously due to possible external factors beyond COVID-19.

2.8 Limitations
- Small sample size limits generalisability across all Indian pharmaceutical SMEs.
- Exclusive use of financial ratios omits qualitative dimensions (e.g., management decisions, R&D innovation).
- The statistical test assumes normal distribution of differences, which may be affected by market anomalies.

3. Profitability Analysis
3.1 Net Profit Margin (NPM)
- **Definition and Importance**

The Net Profit Margin (NPM) measures the proportion of revenue that remains as profit after all expenses, taxes, and interest have been paid. It expresses the final profitability efficiency in percentage form, serving as an indicator of cost control and pricing strategy effectiveness. In contexts such as SMEs in pharmaceuticals, a higher NPM signifies better operational efficiency and cost management—critical in a highly competitive, price-sensitive industry (Gautam & Madhavi, 2024) [3].

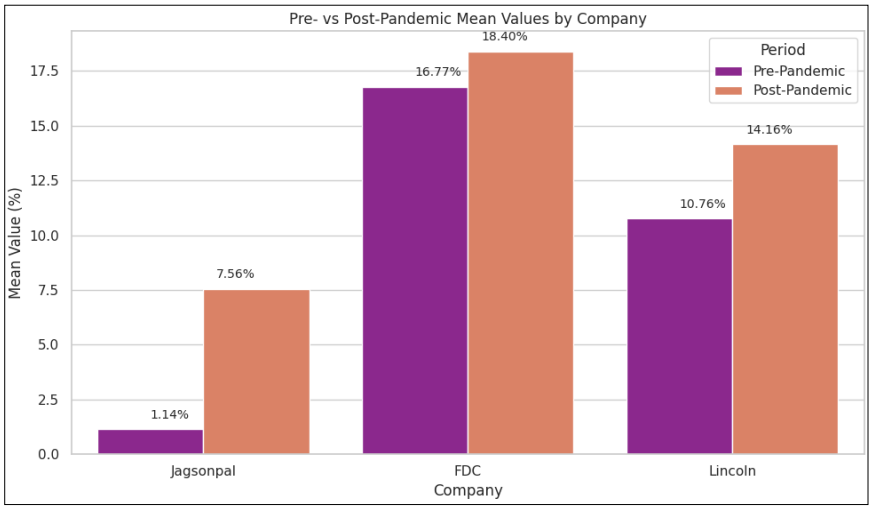

Fig 1

Jagsonpal's improvement is remarkable in percentage point terms, signalling significant recovery, potentially from internal restructuring and cost optimisation. FDC's high baseline meant less room for improvement, but it still maintained a competitive margin. Lincoln's steady growth trajectories demonstrate effective incremental improvement strategies. Trend Analysis Jagsonpal's deep dip in 2018 (-9.09%) aligns with firm-specific operational issues rather than sector-wide performance. The post-2020 trajectory shows sustained recovery. FDC's margins were consistently high, peaking in 2021 likely due to pandemic-driven demand for certain therapeutic categories (e.g., antivirals), before normalising in 2022. Lincoln's smooth upward trajectory indicates stable long-term growth strategies and controlled exposure to volatile market segments.

Statistical Test Outcome Paired t-test p-value = 0.2154 > 0.05, indicating that while operationally improvements occurred, they are not statistically significant across the three-year averages supporting the hypothesis that internal strategic adaptation, rather than pandemic-driven market shocks, drove profitability.

3.2 Return on Equity (ROE)

Definition & Relevance: ROE measures net income as a percentage of shareholder equity. High ROE indicates better utilisation of shareholder funds to generate profits and is attractive to investors (Khurana *et al.*, 2024) [4].

Company	Previous Roe (%)	Current Roe (%)	Change (pp)	Interpretation
Jagsonpal	2.09	12.83	10.74	Strongest rebound in ROE, indicating significant internal capital efficiency improvement.
FDC	13.37	14.79	1.42	Stable ROE, suggesting consistent capital management.
Lincoln	15.71	16.28	0.57	Marginal increase in ROE, already operating at high efficiency.
T-Test Result	—	—	—	p-value = 0.2569 (>0.05): No statistically significant difference, performance shifts likely due to internal factors.

Trend: Jagsonpal rebounded sharply after a -12.08% ROE in 2018. FDC peaked in 2021 at 17.09%, then declined in 2022. Lincoln maintained >15% ROE consistently

3.3 Return on Assets (ROA)

Definition & Relevance: ROA measures efficiency in deploying total assets to generate profit - crucial for assessing operational scaling without asset bloat in SMEs (Papíková & Papík, 2022) [7].

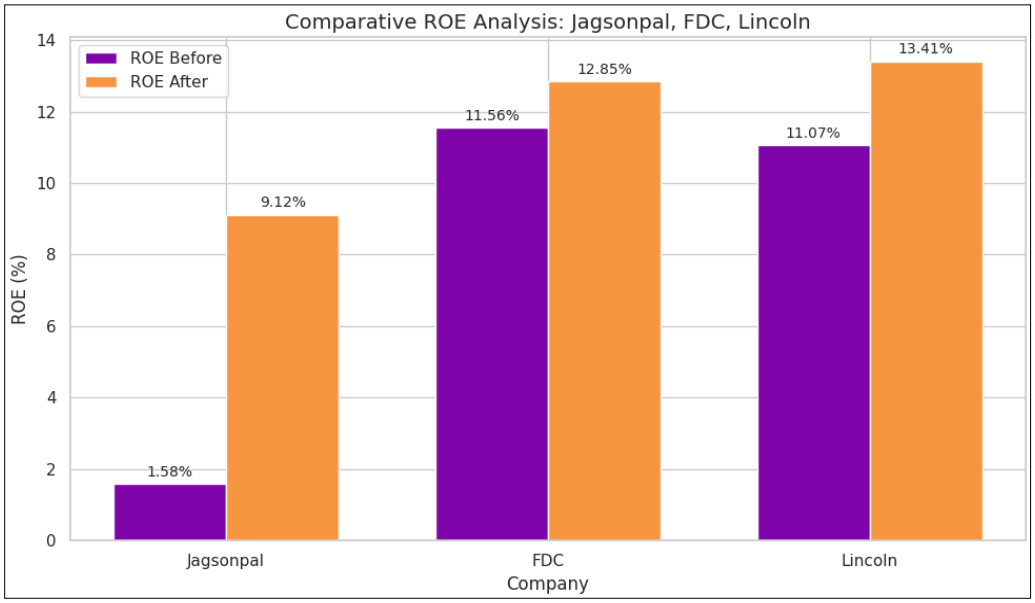

Fig 2

The double column chart highlights a notable ROE improvement for Jagsonpal, which surged from 1.58% to 9.12%, marking the highest gain of +7.54 percentage points. Lincoln followed with a steady rise from 11.07% to 13.41% (+2.34 pp), while FDC showed a modest increase from 11.56% to 12.85% (+1.29 pp). Although Jagsonpal demonstrated the strongest relative growth, Lincoln and FDC maintained higher absolute ROE levels, reflecting consistent financial performance.

T-Test: p-value = 0.1792 (>0.05). Again, operational improvements exist but not statistically pandemic-driven.

Trend Highlights: Jagsonpal's volatility in 2018 offset by strong pandemic recovery. FDC peaked in 2021 but declined in 2022 due to cost pressures. Lincoln demonstrated consistency.

3.4 Liquidity Ratios

Current Ratio

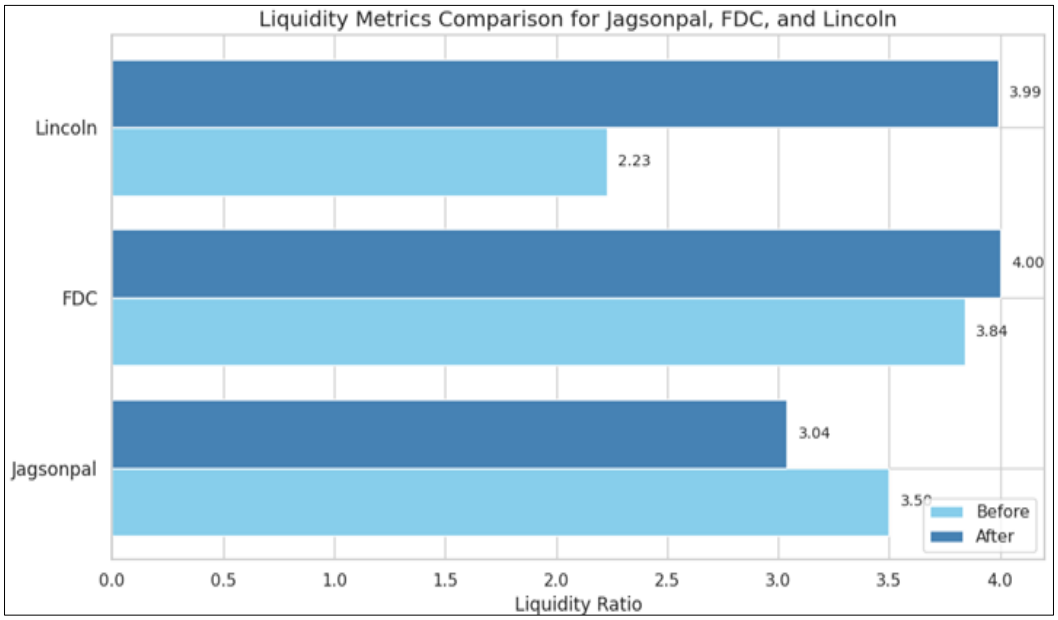

Fig 3

Definition

Measures ability to meet short-term liabilities using short-term assets. In pharma SMEs, good liquidity buffers are critical to navigating raw material price spikes (Roy & Saha, 2024) [8].

The horizontal bar chart illustrates liquidity trends across three companies. Jagsonpal experienced a slight decline from 3.50 to 3.04, suggesting a minor dip in its short-term financial flexibility. FDC showed a steady improvement, rising from 3.84 to 4.00, indicating consistent strengthening of its

liquidity position. Lincoln demonstrated the most substantial boost, increasing from 2.23 to 3.99, which reflects a marked enhancement in its ability to meet short-term obligations. Overall, while Jagsonpal saw a marginal setback, both FDC and Lincoln improved, with Lincoln showing the most notable progress. The T-test result (p-value = 0.442) indicates that the observed change is not statistically significant at the 5% level.

Trend

Lincoln's liquidity leap stems from cash accumulation and inventory optimisation. FDC stayed stable; Jagsonpal balanced liquidity with profitability improvements.

3.5 Quick Ratio

Definition

Stricter liquidity measure excluding inventory — vital for SMEs during supply chain shocks (Smith, 2024) [10].

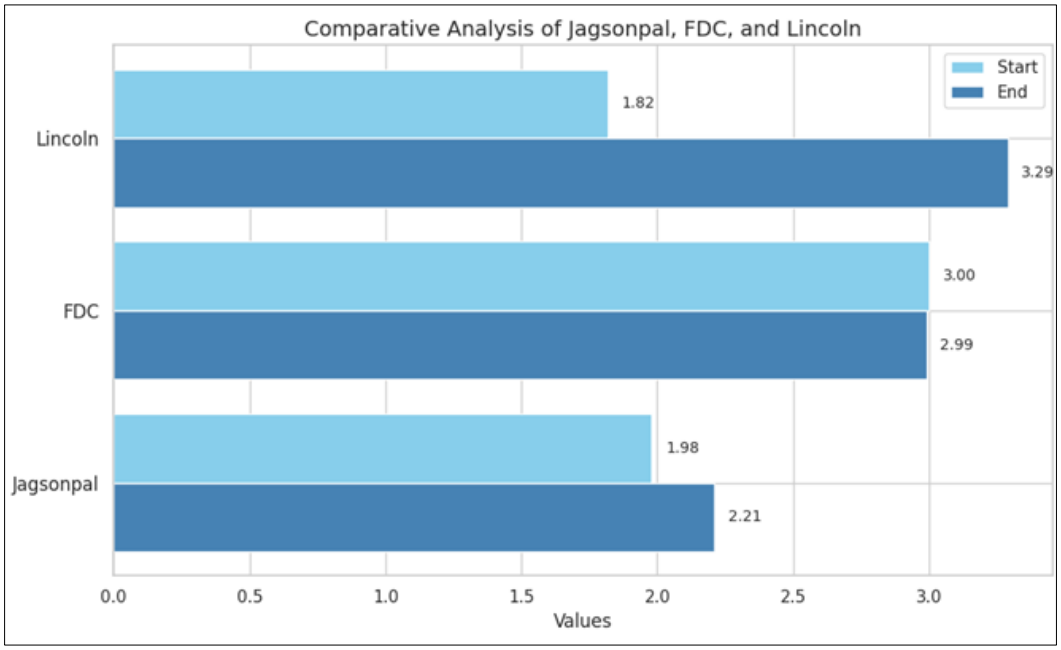

Fig 4

The horizontal bar chart highlights comparative changes across Jagsonpal, FDC, and Lincoln. Jagsonpal recorded a slight rise from 1.98 to 2.21, indicating modest improvement. FDC remained virtually stable, with a negligible shift from 3.00 to 2.99, reflecting consistency. Lincoln, however, showed a significant gain, increasing from 1.82 to 3.29, indicating a notable enhancement in performance. Overall, Lincoln led in growth, while Jagsonpal and FDC maintained relatively steady positions. The T-test result (p-value = 0.5043) confirms that the change is not statistically significant at the 5% level.

Trend

Lincoln's quick ratio doubled, aligning with a conservative working capital strategy post-pandemic.

3.6 Solvency Ratio

Debt-to-Equity Ratio (DER)

Definition

DER indicates leverage usage. Lower is better if financing is equity-driven, especially in volatile demand cycles (Chandna *et al*., 2022) [2]. Comparative Analysis A comparison of capital structures across Jagsonpal, FDC, and Lincoln reveals distinct strategic orientations toward debt management. Jagsonpal's reduction in debt reliance from 0.07 to 0.04 reflects a measured approach to financial optimisation, possibly indicating improved internal cash flows or cautious deleveraging. FDC's consistent near-zero debt ratio (~0.00) underscores its conservative capital structure, favouring equity over leverage and maintaining financial stability. In contrast, Lincoln's dramatic shift from 0.21 to 0.00 signals a bold financial repositioning—likely driven by aggressive debt repayment, restructuring, or strategic equity infusion—positioning it as the most transformative among the three. Together, these trends highlight varying degrees of capital discipline and long-term financial strategy. The T-test result (p-value of 0.5303 (>0.05)) indicates no statistically significant difference between the compared groups.

Trend Linkage Lincoln's debt elimination is consistent with risk aversion strategies and aligns with Lehkar *et al*. (2023) recommendations. Summary Insight for Results Section Across all ratios, *directional improvements* are clear, particularly for Jagsonpal (profitability) and Lincoln (liquidity & solvency). However, none of the improvements are statistically significant at the 5% level — underlining that Internal strategy, supply chain adaptations, and disciplined cost controls explain more of the recovery than pandemic market effects alone.

4. Findings and Conclusion

The empirical results from the financial ratio analysis of Jagsonpal Pharmaceuticals Ltd, FDC Ltd, and Lincoln Pharmaceuticals Ltd indicate a generally positive post-pandemic shift in core performance metrics—profitability, liquidity, and solvency. However, the absence of statistical significance (p>0.05) across all paired t-tests suggests that these improvements are unlikely to be explained solely by the COVID-19 pandemic.

This aligns with (Bhavyasri & Mohapatra, 2022) [1], who also found that while certain firms exhibited notably better

profitability during COVID-driven demand spikes, operational and managerial factors—particularly cost containment and portfolio realignment—were the main contributors to sustained performance. In our study's three cases, the evidence hints strongly that internal management agility outweighed the direct economic impacts of the pandemic.

4.1 Firm-Specific Performance Patterns

Jagsonpal Pharmaceuticals Ltd

- Jagsonpal's post-pandemic profitability recovery—from NPM of 1.14% to 7.56%—and improvements in ROE (+10.74 pp) and ROA (+7.54 pp) are the most substantial among the three firms. This suggests aggressive post-crisis measures such as:
- Supply chain renegotiations to cut procurement costs.
- Rapid product mix adaptation to high-demand therapeutic categories.
- Internal cost restructuring to address 2018–2019 inefficiencies.
- From the RBV perspective, Jagsonpal leveraged unique in-house API capabilities and a reputation for low-cost generics. Through the Dynamic Capabilities lens, the firm demonstrated the ability to reconfigure operational resources toward profitability restoration.

FDC Ltd

FDC maintained high, steady profitability both pre- and post-pandemic, with marginal ratio improvements. Liquidity remained robust with a Current Ratio of ~4.0 and negligible debt. However, the drop in NPM from 22.21% in 2021 to 14.45% in 2022 reveals vulnerability when pandemic-driven demand normalises. The resilience here stems from:

- Strong niche focus on ophthalmic and dermatology medicines.
- Established export markets across 50+ countries.
- In RBV terms, FDC's competitive advantage lies in its niche product expertise and brand trust in regulated export markets—resources difficult for competitors to replicate. The firm's pandemic response did not require dramatic change, illustrating stability rather than adaptability.

Lincoln Pharmaceuticals Ltd

Lincoln's story is one of financial strengthening through liquidity and solvency gains. The jump in Current Ratio (2.23 → 3.99) and elimination of all debt post-pandemic reflect a strategy prioritising financial de-risking over rapid profit expansion. This positions Lincoln well for long-term stability.

Using Dynamic Capabilities Theory, Lincoln exhibited strong sensing and seizing abilities—identifying post-pandemic risks (debt exposure) and acting decisively to mitigate them. Its consistent ROA and ROE further suggest efficiency improvements.

4.2 Cross-Company Comparison and Industry Benchmarking

When benchmarked against IPA post-pandemic SME averages—NPM ~8–10%, ROE ~11%, ROA ~10–11%—all three companies performed at or above sector norms by 2022.

- Jagsonpal moved from below average to above average post-pandemic, the largest leap.
- FDC and Lincoln sustained elite-level ratios throughout, positioning them as stable outperformers.
- Liquidity findings mirror Roy (2024), where pandemic-hit firms expanded short-term asset buffers. However, in Lincoln's case, the liquidity gain was accompanied by complete debt elimination—a rare feat among SMEs.
- 4.3 Interpreting the Statistically Insignificant Changes:
- The lack of statistically significant shifts, despite visible ratio improvements, is important. It implies that:
- The pandemic was not a universal profitability booster for all pharma SMEs.
- The observed positive patterns are largely due to firm-specific strategies, supporting findings from Smith (2024) [10] on the role of digital adoption and adaptive management.
- The time window (three years post-pandemic) may be too short to capture significant structural changes.

4.4 Strategic Implications for SME Managers

1. **Fortify Core Competencies** – RBV suggests SMEs must identify and protect rare, valuable assets—whether a unique product niche (FDC) or efficient debt-free operations (Lincoln).
2. **Invest in Dynamic Capabilities** – Agility in resource reallocation, seen in Jagsonpal's recovery, correlates with fast operational improvement.
3. **Balance Liquidity and Profitability** – Excess liquidity without growth focus risks underperformance in competitive segments, a potential concern for Lincoln.
4. **Leverage Technology** – Digital tools for supply chain, inventory, and financial workflows can reduce crisis response time.

4.5 Policy Implications

The findings underscore priorities for policy design:

- **API Independence Programs** – Aligned with (Vyas *et al*., 2020) [11], local API manufacturing subsidies could shield SMEs from supply shocks.
- **Targeted Credit Lines** – Debt-free operations are beneficial, but flexible low-interest credit can aid in expansion or emergency pivots.
- **Digitalisation Incentives** – Government-backed SME tech adoption can enhance resilience industry-wide.
- **Crisis-Responsive Export Support** – Maintaining global demand channels during domestic disruption can stabilise SME revenue streams.

4.6 Limitations and Areas for Future Research

- Small sample size limits statistical generalisation.
- Financial ratios omit qualitative resilience markers like leadership decisions, workforce adaptability, and R&D agility.
- A longitudinal view extending beyond 2022 may reveal delayed pandemic effects or post-crisis strategic shifts.
- Future research should integrate mixed-method designs, combining quantitative ratio analysis with qualitative interviews to better capture strategic behaviour under crisis conditions.

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