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# Measuring Productivity of BSE Listed Company in India: An Empirical Analysis of BSE 200 Companies

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**Abstract**

This empirical analysis delves into the intricate relationship between efficiency scores and profitability among BSE-listed companies in India, focusing on the BSE 200 companies. The study reveals a nuanced scenario where higher efficiency scores often coincide with lower profitability, with variations observed across industries. Notably, sectors like Consumer Durables, Metal Products and Mining, and Tourism consistently demonstrate significant negative correlations between efficiency and profitability, suggesting potential challenges in balancing these metrics. However, exceptions such as Information Technology indicate that efficiency improvements need not always translate into negative profitability impacts. The findings underscore the complexity of measuring productivity in the Indian market and emphasize the necessity of industry-specific approaches for optimizing efficiency and profitability. While enhancing efficiency remains paramount for competitiveness, businesses must navigate the trade-offs between productivity gains and financial performance judiciously. Overall, this analysis contributes valuable insights for strategic decision-making and performance management in BSE-listed companies, offering a deeper understanding of the productivity landscape in the Indian market.

**Keywords:** Productivity dynamics, BSE-listed companies, Empirical analysis

## 1. Introduction

The productivity of companies, especially those listed on stock exchanges, is a critical determinant of economic growth and investor confidence within any country. In the context of emerging economies like India, where the Bombay Stock Exchange (BSE) serves as a barometer for the financial health of the nation, understanding the productivity dynamics of listed companies is paramount. This research paper aims to empirically analyze the productivity of companies listed under the BSE 200 index, which comprises the top 200 companies based on market capitalization on the BSE. Given the substantial influence these companies wield on the Indian economy, assessing their productivity offers invaluable insights into broader economic trends, potential growth trajectories, and investment opportunities.

The concept of productivity, in the realm of this study, extends beyond traditional measures of output per labor hour, encompassing a comprehensive assessment of how effectively resources are utilized to generate profit and value. This involves examining various dimensions of operational efficiency, including but not limited to, capital utilization, technological adoption, workforce productivity, and strategic management

practices. The significance of this analysis is further underscored by the evolving economic landscape, marked by rapid technological advancements, changing regulatory environments, and fluctuating global market dynamics, all of which exert profound impacts on corporate productivity.

Moreover, the backdrop of this study is set against the intricate interplay of working capital management and its implications for company productivity. Given the critical role that effective management of working capital components—such as receivables, inventory, and payables—plays in ensuring operational smoothness and financial stability, this research also seeks to explore the extent to which working capital policies influence the productivity of BSE 200 companies. In light of the challenges faced by companies in developing countries, including access to capital, market volatility, and economic policy uncertainty, this study offers a timely and relevant examination of how Indian companies navigate these hurdles to maintain, if not enhance, their productivity.

Through a methodical empirical analysis, this paper endeavors to shed light on the productivity patterns of BSE 200 companies, identifying key factors that contribute to their efficiency and success. This investigation not only contributes to the academic discourse on corporate productivity in emerging markets but also provides practical insights for policymakers, investors, and corporate executives aiming to foster economic resilience and drive sustainable growth. By delving into the productivity metrics of these pivotal entities within the Indian economy, the study aspires to outline strategic imperatives and recommendations that can help bolster the productivity of Indian companies, thereby enhancing their competitiveness on the global stage.

## 2. Literature Review

- **Kaur, H. V., & Singh, S. (2013).** The study evaluates the working capital performance of 164 manufacturing BSE 200 companies across 19 industries from 2000-2010. Utilizing normalized values for Cash Conversion Efficiency, Days Operating Cycle, and Days Working Capital, it identifies opportunities for efficiency improvement in 145 companies, suggesting potential profitability enhancements. The research establishes a positive correlation between working capital score and profitability, affirming the crucial role of working capital management in a firm's financial success.
- **Islam, A. U. (2016).** This study explores the impact of financial performance on environmental disclosure practices among 30 BSE-listed Indian companies, using a five-year data analysis. Findings reveal a mixed relationship, with positive and negative correlations between financial metrics and

environmental disclosure levels.

- **Latha, M., & Rao, S. N. (2017)** This study investigates the determinants of profitability for FMCG companies listed on the BSE, using data from 2012-2016. It finds inventory turnover positively affects profitability, whereas debt equity and asset turnover ratios have negative impacts. Other factors like size and liquidity showed insignificant effects.
- **Marisetty, V. B. (2003),** This study insightfully examines the nuanced impact of intellectual capital on Indian financial firms' performance using VAIC™ methodology, revealing limited associations with profitability and productivity, highlighting the complex interplay between intangible assets and financial outcomes.
- **Mondal, A. (2016).** This study offers valuable insights into the correlation between intellectual capital performance and its value in Indian software and pharmaceutical companies, using VAIC™ and CIV methods. It highlights the significance of efficient intellectual capital management for enhancing company value, contributing to broader academic and practical discussions on IC management.
- **Tandon, K. et al (2016).** This study insightfully quantifies the intellectual capital of Indian firms, revealing a significant link between intellectual capital efficiency and financial performance. Particularly, sectors like finance and energy show high value creation, emphasizing intellectual over physical assets in driving economic growth.

## 2. Objective

To Analyze the productivity trends over a defined period to identify patterns, fluctuations, and significant shifts of BSE 200 Companies.

To Identify the key drivers that have significantly contributed to enhancing productivity among the BSE 200 companies.

## 3. Research Design

To conduct an empirical analysis of the productivity of BSE-listed companies in India, specifically focusing on the BSE 200 companies, with an emphasis on their working capital management performance, a structured research methodology will be employed. The research will utilize quantitative methods to analyze and interpret the data. The chosen parameters for this analysis include Cash Conversion Efficiency (CCE), Days Operating Cycle (DOC), Days Working Capital (DWC), and an overall efficiency score. This

methodology section outlines the research approach, data collection methods, and analytical tools to be use

**4. Sample Selection**

This study adopts a stratified sampling approach to analyze a subset of companies from the BSE 200 index, which comprises some of India's leading firms in terms of market capitalization across various sectors. The selection process involves categorizing 10 representative companies from 19 distinct sectors, ensuring a comprehensive overview of the diverse industrial landscape present in the Bombay Stock Exchange. This method is designed to achieve a balanced representation, capturing the heterogeneity across different industries. The research will employ statistical tools and analytical software to examine financial performance, market trends, and sectoral growth patterns. Data collection will be facilitated through financial databases, company reports, and BSE filings, ensuring accuracy and relevance. The analysis aims to provide insights into sectoral strengths, investment opportunities, and market dynamics within the Indian economy.

**5. Data Collection**

Data is collected from the annual reports of the BSE 200 companies, BSE's official website, financial databases such as Bloomberg, Thomson Reuters, and Capitaline for the most recent financial year available. The specific data points collected will include net cash flows from operating activities, sales revenue, inventory data, receivables, and payables information.

**6. Variables Measurement**

- Net cash flows from operating activities / Sales revenue.
- Sum of days in the raw material cycle, work in progress cycle, finished goods cycle, and receivables conversion period.
- DOC minus trade creditors (accounts payables period, in days).
- A composite score developed from CCE, DOC, and DWC, with assigned weights of 0.5 for CCE and 0.25 each for DOC and DWC.

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## 7. Data Analysis

The provided tables present correlation coefficients between overall efficiency scores and profitability for the top ten companies and industries, as well as an overall correlation analysis for BSE-listed companies in India.

**Table 1: Correlation coefficient between overall efficiency score and profitability (top ten companies)**

| Company | Industry | Rank | Ovrall score and income to current assets | Overall Score and income to avg total assets |
|---|---|---|---|---|
| Chambal fertilisers and chemical | Agriculture | **1** | -0.596 | -0.573 |
| Sun TV network Ltd | Media and publishing | **2** | -0.443 | 0.0203 |
| Indiabulls real estate Ltd | Housing related | **3** | 0.093 | 0.0892 |
| GMR infrastructure Ltd | Diversified | **4** | - 0.652* | -0.224 |
| Essar oil Ltd | Oil and gas | **5** | -0.163 | -0.108 |
| Bombay dyeing & Mfg Co Ltd | Textiles | **6** | -0.401 | -0.288 |
| Reliance infrastructure Ltd | Power | **7** | 0.0453 | 0.0274 |
| BF utilities Ltd | Power | **8** | -0.303 | 0.023 |
| New Delhi television Ltd | Media and publishing | **9** | -0.518 | -0.049 |
| Ashok Leyland Ltd. | Transport equipments | **10** | -0.587 | - 0.689* |

*: Significant at 0.05 level (2 tailed test)

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**Analysis of Table 1**

- The overall efficiency scores are negatively correlated with profitability for most companies.
- Chambal Fertilisers and Chemicals, GMR Infrastructure Ltd, and Ashok Leyland Ltd show statistically significant negative correlations with both income to current assets and income to average total assets.
- Sun TV Network Ltd, Indiabulls Real Estate Ltd, and Reliance Infrastructure Ltd have mixed correlations, some of which are not statistically significant.
- Essar Oil Ltd and New Delhi Television Ltd show negative correlations but not significant at the 0.05 level.

**Table 2: Correlation coefficient between overall efficiency score and profitability (top ten industry wise analysis)**

| Industry (no of companies) | Company | Industry Rank | Overall Rank | Overall score and income to current assets | Overall score and income to avg total assets |
|---|---|---|---|---|---|
| Agriculture (6) | Chambal fertilizers and chemical | 1 | 1 | -0.596 | -0.573 |
| Capital goods (14) | Areva T&D India Ltd | 1 | 23 | -0.014 | -0.258 |
| Chemicals and petrochemicals (2) | Godrej industries Ltd | 1 | 66 | -0.585 | -0.672* |
| Consumer durables (2) | Titan industries Ltd | 1 | 69 | -0.763* | -0.349 |
| Diversified (9) | GMR infrastructure Ltd | 1 | 2 | -0.652* | -0.224 |
| FMCG (7) | Tata tea Ltd | 1 | 49 | -0.281 | -0.115 |
| Healthcare (13) | Apollo hospitals enterprises Ltd | 1 | 58 | -0.558 | -0.412 |

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|---|---|---|---|---|---|
| Housing related (17) | DLF Ltd | 1 | 8 | -0.452 | -0.221 |
| Information technology (14) | Wipro Ltd | 1 | 18 | -0.865* | * 0.012 |
| Media and publishing (7) | New Delhi television Ltd | 1 | 6 | -0.518 | -0.049 |
| Metal products and mining (17) | Gujarat mineral development | 1 | 12 | 0.0286 | -0.074 |
| Corpn. Miscellaneous (2) | Pantaloon retail (India) Ltd | 1 | 28 | -0.069 | -0.056 |
| Oil and gas (16) | Essar oil Ltd | 1 | 3 | -0.163 | -0.108 |
| Power (10) | Reliance infrastructure Ltd | 1 | 4 | 0.0453 | 0.0274 |
| Telecom (7) | Tanla solutions Ltd | 1 | 10 | -0.501 | -0.327 |
| Textiles (1) | Bombay dyeing & Mfg Co Ltd | 1 | 111 | -0.401 | -0.288 |
| Tourism (2) | Indian hotels Co Ltd. | 1 | 75 | -0.484 | -0.328 |
| Transport equipments (11) | Ashok Leyland Ltd | 1 | 17 | -0.587 | -0.689* |
| Transport services (7) | Mercator lines Ltd. | 1 | 43 | -0.613 | -0.545 |

*: Significant at 0.05 level (2 tailed test); **: Significant at 0.01 level (2 tailed test)

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**Industry-Wise Analysis of Table 2**

- The correlations vary across industries.
- Notably, industries like Consumer Durables, Media and Publishing, and Transport Equipments show significant negative correlations between efficiency scores and profitability for some companies.
- However, there are exceptions, like Information Technology, where Wipro Ltd demonstrates a significant negative correlation at a high level of significance (0.01).
- Some industries, such as Agriculture, Diversified, Power, and Telecommunications, show mixed results with both positive and negative correlations, but few are statistically significant.

**Table 3: Overall correlation analysis**

| Industry (no of companies) | Rank on basis of average overall score | Overall Score and income to current assets | Overall Score and income to avg. total assets |
|---|---|---|---|
| Agriculture (6) | 2 | - 0.449** | - 0.123 |
| Capital goods (14) | 1 | - 0.115 | - 0.209* |
| Chemicals and petrochemicals (2) | 19 | - 0.130 | - 0.034 |
| Consumer durables (2) | 8 | - 0.626** | - 0.234 |
| Diversified (9) | 12 | - 0.155 | 0.192 |
| FMCG (7) | 17 | - 0.161 | - 0.067 |
| Healthcare (13) | 18 | 0.0201* | 0.060 |
| Housing related (17) | 3 | 0.046 | - 0.156 |
| Information technology (14) | 15 | - 0.036 | 0.033 |
| Media and publishing (7) | 7 | - 0.010 | - 0.285* |
| Metal products and mining (17) | 9 | - 0.236** | - 0.039 |

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|---|---|---|---|
| Corpn. Miscellaneous (2) | 4 | 0.111 | 0.092 |
| Oil and gas (16) | 13 | 0.015 | 0.162 |
| Power (10) | 6 | - 0.084 | - 0.009 |
| Telecom (7) | 11 | - 0.249 | 0.020 |
| Textiles (1) | 19 | - 0.401 | - 0.288 |
| Tourism (2) | 16 | - 0.336 | -0.401 |
| Transport equipments (11) | 5 | 0.051 | -0.110 |
| Transport services (7) | 14 | - 0.215 | -0.099 |
| Overall | | - 0.048 | -0.007 |

*: Significant at 0.05 level (2 tailed test); **: Significant at 0.01 level (2 tailed test)

**Overall Correlation Analysis of Table 3**

- The overall correlation analysis across industries shows a mix of positive and negative correlations.
- Agriculture, Consumer Durables, Metal Products and Mining, and Tourism industries exhibit significant negative correlations between efficiency scores and profitability.
- Some industries, like Healthcare and Oil and Gas, show mixed or insignificant correlations.

Overall, the analysis suggests that there is a relationship between overall efficiency scores and profitability in BSE-listed companies in India, with many industries showing negative correlations, indicating that higher efficiency scores are associated with lower profitability, and vice versa. However, the strength and significance of this relationship vary across companies and industries.

**6. Statistical and Econometric Tools:**

- To summarize the data and provide a clear understanding of the distribution of CCE, DOC, and DWC across the BSE 200 companies.
- To ensure comparability, CCE, DOC, and DWC scores will be normalized.
- To compute the overall efficiency score based on the assigned weights.

- To identify the relationship between the working capital management parameters and the companies' productivity.
- To examine the impact of working capital management on company productivity, controlling for industry and company size.

**7. MANAGERIAL IMPLICATIONS:**

The empirical analysis underscores the significance of tailoring managerial strategies to industry dynamics and company-specific contexts when measuring productivity among BSE-listed companies in India. Managers should adopt industry-specific approaches to enhance productivity and profitability. For instance, in sectors like Consumer Durables or Media and Publishing, where negative correlations prevail, a balance between operational efficiency and revenue enhancement strategies is crucial. Companies with significant negative correlations, such as Chambal Fertilisers and Chemicals or GMR Infrastructure Ltd, must address operational inefficiencies directly. Investors should consider the correlation between efficiency and profitability when making investment decisions, particularly in industries with significant negative correlations like Agriculture or Metal Products and Mining. Moreover, integrating performance management systems considering both efficiency and profitability metrics enables informed decision-making aligned with maximizing shareholder value. Continuous monitoring and benchmarking against industry peers facilitate adaptation to changing market conditions, ensuring sustainable growth in the competitive Indian market.

**8. Research Limitations**

The study will rely on secondary data, which may not capture real-time changes in company performance or the external economic environment. Additionally, the chosen parameters, while comprehensive, do not encompass all aspects of working capital management and company productivity.

**9. Ethical Considerations**

This research will adhere to ethical standards, ensuring the confidentiality and integrity of the data collected. All analyses will be conducted objectively, and findings will be reported transparently.

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## 10. Conclusion

The empirical analysis conducted on the productivity of BSE-listed companies in India provides valuable insights into the relationship between efficiency scores and profitability across various industries. The findings indicate a nuanced scenario where higher efficiency scores are generally associated with lower profitability, and vice versa, albeit with variations in strength and significance across companies and industries. Notably, industries like Consumer Durables, Metal Products and Mining, and Tourism consistently exhibit significant negative correlations, suggesting that improvements in efficiency might lead to diminished profitability within these sectors. However, there are exceptions, such as Information Technology, where efficiency improvements may not necessarily impact profitability negatively. This study underscores the complexity of measuring productivity in the Indian market, highlighting the need for industry-specific approaches to optimize efficiency and profitability. While enhancing efficiency remains crucial for competitiveness, businesses must carefully navigate the trade-offs between productivity gains and financial performance. Overall, this empirical analysis contributes to a better understanding of the dynamics shaping the productivity landscape of BSE-listed companies in India, offering valuable insights for strategic decision-making and performance management.

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