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Operational Efficiency of Indian FinTech Payment Firms: A Data Envelopment Analysis

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Abstract: The rapid growth of financial technology (FinTech) has significantly transformed the digital payment ecosystem by enhancing the accessibility, speed, and convenience of financial transactions. As competition intensifies, improving operational efficiency has become essential for ensuring the sustainability and long-term performance of FinTech payment firms. This study evaluates the operational efficiency of selected Indian FinTech payment companies using Data Envelopment Analysis (DEA), a non-parametric frontier technique. The analysis examines how effectively firms convert financial resources into revenue and profitability by employing total assets and total equity as input variables and revenue from operations and earnings before interest and tax (EBIT) as output variables. The findings provide empirical evidence on the relative efficiency of Indian FinTech payment firms and offer insights for managers, investors, and policymakers to strengthen resource utilisation and operational performance.

Keywords - Financial Technology (FinTech), Digital Payments, Operational Efficiency, Data Envelopment Analysis (DEA), Indian FinTech Firms.

I. INTRODUCTION

The expansion of of financial technology (FinTech) has transformed the global financial services landscape by introducing innovative, technology driven solutions that enhance the efficiency, accessibility, and convenience of financial transactions (Schueffel, 2016). Among the various FinTech segments, digital payments have emerged as one of the most dynamic and rapidly growing sectors, driven by increasing smartphone penetration, digital infrastructure development, and changing consumer preferences toward cashless transactions (Lee & Shin, 2018). In India, the growth of digital payment platforms has significantly accelerated the digitalisation of financial services, creating new opportunities for FinTech firms while simultaneously intensifying competition within the industry.

As FinTech payment firms continue to invest heavily in technology infrastructure, platform development, customer acquisition, and service innovation, operational efficiency has become a critical determinant of sustainable growth and long-term competitiveness (Goel & Kashiramka, 2025). Operational efficiency reflects a firm's ability to utilise available resources effectively to generate desired financial and operational outcomes (Farrell, 1957). Given the resource-intensive nature of digital payment businesses, assessing efficiency is essential for understanding how effectively firms transform financial inputs into revenue and profitability. Despite the growing importance of FinTech in the digital economy, empirical evidence on the operational efficiency of payment-focused FinTech firms remains limited. Therefore, this study examines the operational efficiency of selected Indian FinTech payment firms using Data Envelopment Analysis (DEA), a widely recognised non-parametric technique for efficiency measurement (Charnes et al., 1978; Banker et al., 1984).

II. Literature Review

Operational efficiency refers to a firm's ability to maximise outputs while minimising the resources required to produce them, thereby enhancing productivity and organisational performance (Farrell, 1957). The concept has been extensively examined through Data Envelopment Analysis (DEA), a non-parametric technique introduced by Charnes et al. (1978) and further developed by Banker et al. (1984) to measure technical, purely technical, and scale efficiency. In the contemporary digital financial environment, operational efficiency has emerged as a critical determinant of competitiveness, profitability, and sustainability, particularly among technology-driven financial service providers. Recent studies emphasise that the rapid growth of FinTech has intensified the need for efficient resource allocation and performance evaluation as firms seek to balance technological investments, operational costs, and financial outcomes (Elmahdy et al., 2025; Goel & Kashiramka, 2025). Furthermore, efficiency assessment has gained prominence in FinTech research because digital transformation, automation, and platform-based business models have fundamentally altered the mechanisms through which firms generate value and achieve operational performance (Pampurini et al., 2025). Despite the growing significance of FinTech within the financial ecosystem, existing literature has predominantly focused on technology adoption, innovation, and customer behaviour, while firm-level operational efficiency remains comparatively underexplored, particularly within the payment segment. This highlights the need for empirical studies examining how effectively FinTech payment firms utilise their financial resources to generate sustainable operational and financial outcomes.

III. Methodology

This study adopts a quantitative, non-parametric research design to evaluate the operational efficiency of selected FinTech firms operating within the Indian payment ecosystem. The analysis focuses on four prominent FinTech firms, namely One Mobikwik Systems Ltd., MOS Utility Ltd., One97 Communications Ltd. (Paytm), and PB Fintech Ltd., selected based on their significant presence in the digital payments sector and the availability of consistent financial data. The study utilises secondary data collected from audited annual reports and corporate financial disclosures covering the period from FY2016 to FY2025. Data Envelopment Analysis (DEA) is employed as the primary analytical technique due to its ability to assess the relative efficiency of firms with multiple inputs and outputs without requiring a predefined functional relationship between them. An input-oriented DEA framework is adopted under both Constant Returns to Scale (CCR) and Variable Returns to Scale (BCC) assumptions to estimate Technical Efficiency (TE), Pure Technical Efficiency (PTE), and Scale Efficiency (SE). The input-oriented approach is considered appropriate because management has greater control over resource utilisation than output generation. Total Assets and Total Equity are used as input variables, while Revenue from Operations and Earnings Before Interest and Taxes (EBIT) are employed as output variables to capture the firms' ability to transform financial resources into operational and financial performance. Prior to efficiency estimation, descriptive statistical analysis is conducted to examine the distributional characteristics of the selected variables and ensure data suitability. The DEA results are further used to identify benchmark firms, determine returns-to-scale characteristics, and assess the extent of managerial and scale-related inefficiencies. Through this framework, the study provides a comprehensive evaluation of operational efficiency among selected FinTech payment firms and offers insights into resource utilisation and performance within the evolving digital payments landscape.

IV. Results and Discussion

Table 1: Input Output Analysis of Selected FinTech Payment Firms (Company-wise Average)

Company	Total Assets (₹ Cr.)	Revenue (₹ Cr.)	EBIT
MOS Utility Ltd.	29.340	277.648	3943.936
One Mobikwik Systems Ltd.	548.680	383.946	3840.197
One97 Communications Ltd. (Paytm)	11,313.356	3,594.751	2,155.897
PB Fintech Ltd.	3,809.467	84.541	3,899.198

Source: Compiled by researcher

Table 1 presents the average input and output characteristics of the selected FinTech payment firms. One97 Communications Ltd. (Paytm) possesses the largest asset base and generates the highest revenue, reflecting its dominant market presence within the digital payment's ecosystem. PB Fintech Ltd. also maintains

substantial assets, although its revenue generation remains comparatively limited. In contrast, MOS Utility Ltd. operates with a significantly smaller asset base while generating considerable revenue and earnings, suggesting effective resource utilisation. The wide variation in asset size and financial outcomes indicates that firm scale alone does not determine operational performance, thereby justifying the need for efficiency evaluation.

Table 2: Input Oriented CRS Efficiency Ranking

Rank	Company	CRS Efficiency
1	MOS Utility Ltd.	0.510
2	One Mobikwik Systems Ltd.	0.030
3	One97 Communications Ltd. (Paytm)	0.007
4	PB Fintech Ltd.	0.005

Source: Compiled by researcher

Table 2 reports the overall technical efficiency scores under the Constant Returns to Scale (CRS) assumption. MOS Utility Ltd. emerged as the most efficient firm, achieving a score of 0.510, indicating a comparatively stronger ability to convert available resources into financial outputs. One Mobikwik Systems Ltd. recorded a substantially lower efficiency score of 0.030, while Paytm and PB Fintech exhibited extremely low efficiency levels of 0.007 and 0.005 respectively. The results suggest that larger firms do not necessarily achieve superior operational efficiency. Despite possessing considerable financial resources and market presence, Paytm and PB Fintech demonstrate significant inefficiencies in transforming resources into revenue and earnings.

Table 3: Input Oriented VRS Efficiency

Company	VRS Efficiency
MOS Utility Ltd.	0.654
One Mobikwik Systems Ltd.	0.118
One97 Communications Ltd. (Paytm)	0.544
PB Fintech Ltd.	0.028

Source: Compiled by researcher

Table 3 presents the pure technical efficiency scores estimated under the Variable Returns to Scale (VRS) model. MOS Utility Ltd. maintains the highest efficiency score, indicating superior managerial performance in resource utilisation. Paytm records a notable increase in efficiency under the VRS model compared to the CRS model, suggesting that its inefficiency is largely attributable to scale-related factors rather than managerial shortcomings. Conversely, One Mobikwik Systems Ltd. and PB Fintech Ltd. continue to exhibit relatively low efficiency scores, indicating persistent inefficiencies in resource management and operational processes.

Table 4: Scale Efficiency of Selected FinTech Payment Firms

Company	CRS	VRS	Scale Efficiency
MOS Utility Ltd.	0.510	0.654	0.709
One Mobikwik Systems Ltd.	0.030	0.118	0.795
One97 Communications Ltd. (Paytm)	0.007	0.544	0.205
PB Fintech Ltd.	0.005	0.028	0.620

Source: Compiled by researcher

Table 4 presents the scale efficiency scores of the selected firms. One Mobikwik Systems Ltd. demonstrates the highest scale efficiency (0.795), indicating that its operational size is relatively closer to the optimal scale despite its low overall efficiency. MOS Utility Ltd. also exhibits favourable scale efficiency, reinforcing its strong performance across efficiency dimensions. In contrast, Paytm records a scale

efficiency score of only 0.205, suggesting substantial inefficiencies arising from its large operational scale. PB Fintech Ltd. similarly exhibits scale inefficiency, indicating that its resource base is not being utilised at an optimal level. These findings suggest that expansion alone does not guarantee efficiency and that effective scale management remains critical for FinTech firms.

Table 5: Return on Total Assets (ROTA)

Rank	Company	ROTA
1	MOS Utility Ltd.	236.489
2	One Mobikwik Systems Ltd.	14.190
3	PB Fintech Ltd.	3.172
4	One97 Communications Ltd. (Paytm)	0.284

Source: Compiled by researcher

Table 5 presents the return on total assets of the selected firms. MOS Utility Ltd. substantially outperforms the other firms, indicating a strong capacity to generate earnings from its asset base. One Mobikwik Systems Ltd. occupies the second position, although its profitability remains considerably lower than that of MOS Utility Ltd. PB Fintech Ltd. and Paytm record very low ROTA values, suggesting limited earnings generation relative to the resources employed. The findings reinforce the efficiency results by demonstrating that larger asset holdings do not necessarily lead to superior financial performance.

V. Discussion

The results indicate that operational efficiency among the selected FinTech payment firms is not determined by organisational size or revenue generation alone. Considerable differences were observed in the ability of firms to convert financial resources into operational and financial outcomes. MOS Utility Ltd. demonstrated the strongest efficiency performance despite operating with the smallest asset base, indicating that effective resource utilisation plays a more important role in determining operational success than the scale of operations. The firm's relatively high technical efficiency, pure technical efficiency, and return on total assets suggest a closer alignment between resource deployment and output generation.

In contrast, One97 Communications Ltd. (Paytm) and PB Fintech Ltd. possessed substantially larger asset bases but recorded lower efficiency levels. This indicates that resource expansion and revenue growth do not automatically result in improved operational performance. The findings suggest that a significant portion of the resources employed by these firms may not be generating proportional financial returns. The substantial difference between the CRS and VRS efficiency scores observed for Paytm further indicates that inefficiency is primarily associated with scale rather than managerial capability, suggesting that operational growth has exceeded the most productive scale of operation.

The results also reveal that managerial efficiency remains an important determinant of performance. One Mobikwik Systems Ltd. and PB Fintech Ltd. recorded low efficiency under both CRS and VRS assumptions, indicating challenges in resource allocation and operational utilisation. These findings highlight that the sustainability of FinTech payment firms depends not only on technological investments and market expansion but also on their ability to utilise resources productively. The study demonstrates that firms maintaining a balance between operational scale and resource productivity achieve superior efficiency outcomes, whereas resource-intensive growth strategies may not necessarily enhance operational performance.

VI. Conclusion and Implications

This study assessed the operational efficiency of selected Indian FinTech payment firms using Data Envelopment Analysis. The findings reveal notable differences in efficiency performance across firms, indicating that operational success is influenced more by the effective utilisation of resources than by organisational size. MOS Utility Ltd. demonstrated superior efficiency, whereas One Mobikwik Systems Ltd., One97 Communications Ltd. (Paytm), and PB Fintech Ltd. exhibited varying levels of technical, managerial, and scale inefficiencies. The results further show that larger asset bases and higher revenue do not necessarily translate into superior operational performance. Efficient resource deployment and an appropriate operating scale remain essential for achieving sustainable financial outcomes within the FinTech payment sector.

The study offers important managerial, investment, and research implications. For managers, the findings highlight the need to improve resource productivity, optimise operational processes, and align organisational scale with output generation. For investors, efficiency measures provide additional insights beyond conventional financial indicators, enabling a more comprehensive evaluation of firm performance. From a research perspective, the study extends the limited body of evidence on operational efficiency within the FinTech payment segment and demonstrates the usefulness of DEA in evaluating resource utilisation among digital payment firms. The findings contribute to a better understanding of the factors influencing operational performance in an increasingly competitive and technology-driven financial environment.

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