CHAPTER 6

OPERATING EFFICIENCY OF CEP SERVICE PROVIDERS IN TIMES OF DISRUPTIONS

6.1 Introduction

This chapter examines the analysis and interpretation of the operational efficiency of courier, express, and parcel (CEP) service providers. Operating efficiency is essential for CEPs to maintain competitiveness in a rapidly changing market characterized by unpredictable disruptions, where the capacity to maximize resources and deliver services effectively is impacted. This study employs six fundamental efficiency indicators to evaluate the operational capacities of CEP providers: operational flexibility, express/time-sensitive delivery, cost-effectiveness, short processing time, short response time, and delivery agents' efficiency. These indicators represent multiple aspects of a service provider's capacity to adjust to disruptive market situations, manage expenses, and provide services. A data-driven methodology employing factor analysis is utilized to compute a comprehensive efficiency score for CEPs and thereby quantify the operating efficiency of the industry. This statistical method facilitates the discovery of fundamental aspects that lead to operational success. Furthermore, regression analysis is performed to ascertain the relationship between operating efficiency and business performance, elucidating how enhancements in operational practices yield superior organizational results.

6.2 Methodology for calculating the efficiency score:

The efficiency score (IS_{OE}) for each factor was computed by dividing the total weighted value (X_{c_i}) by the weight factor (ω_{c_i}) associated with the indicators. This ratio normalizes the aggregate contribution of the items within the construct, providing a standardized index score that reflects the overall performance and relevance of the factor in the context of the model.

The formula for the efficiency score is calculated by using Eq (6) as explained in the methodology chapter:

$$IS_{OE} = \frac{X_{c_i}}{\omega_{C_i}} \quad \ldots (6)$$

6.3 Measuring the efficiency of CEPs

6.3.1 Pillars of operating efficiency measurement

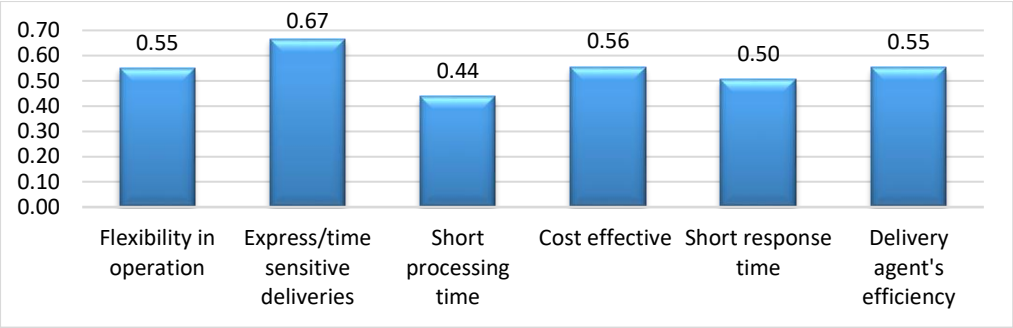

Figure 6.1 Sub-indicators weights of operating efficiency

Figure 6.1 presents the weights of variables concerning their impact on operating efficiency. Each weight signifies the variable's relative significance within the broader operational framework.

6.3.1.1 Operational flexibility

Operational flexibility holds moderate significance, indicating that the ability to adapt operations to varying situations is moderately significant for operational efficiency. Flexibility becomes increasingly vital during unforeseen disruptions, perhaps elevating its significance beyond typical circumstances. In disruptive situations, the capacity to swiftly modify operations, redirect supplies, and adapt to changed supply chains is crucial for sustaining service continuity. For instance, during a pandemic, pathways may be obstructed, and consumer preferences may transition towards contactless deliveries. Flexibility enables CEP providers to modify delivery methods, reassign resources, or alter delivery schedules without significant delays.

6.3.1.2 Express/time-sensitive deliveries

Express/time-sensitive deliveries possess the maximum weight of 0.670, indicating that this variable is the most pivotal aspect in the model. The capacity to manage expedited or time-sensitive deliveries is crucial for operational performance, indicating a growing need

for rapid and timely services. In times of considerable disruptions, the necessity for quick and time-sensitive delivery markedly escalates, hence augmenting the efficacy of Courier, quick, and Parcel (CEP) services. In situations where customers want important items—such as medical supplies, pharmaceuticals, or perishables—expedited delivery becomes paramount. The capacity to perform express deliveries during these periods highlights the provider's versatility and commitment to maintaining service efficiency despite adverse conditions. By emphasizing rapid, reliable deliveries, organizations demonstrate their adaptability and reliability, setting themselves apart from competitors who may exhibit slower responsiveness. Although disruptions may affect routine operations, CEP providers who adeptly manage time-sensitive deliveries can improve overall efficiency. This frequently entails using new strategies, such as enhancing transportation networks or designating dedicated staff to manage urgent requests. By doing so, they enhance both their express services and their overall logistical skills, positioning themselves to more effectively address future difficulties. Consequently, prioritizing express delivery during disruptions enhances efficiency throughout the supply chain, facilitating rapid fulfillment of essential orders and augmenting the provider's crisis management capabilities

6.3.1.3 Short processing time

The short processing time possesses the lowest weight of 0.437, signifying that although reducing processing time is vital, it is comparatively less influential than other factors. This indicates that additional operational factors may exert a more significant impact on performance. During disruptions, short processing time is still necessary for working efficiency, but it might not become much more important because of problems with the system as a whole. Short processing time means how quickly packages are sorted, prepared, and sent out within a company's own processes. This is important for keeping service levels high in normal situations. But during emergencies like natural disasters or pandemics, things outside of its control, like transportation delays, route interruptions, or a lack of staff, can make it less useful. For example, even if a company has fast internal processing, problems in the supply chain or limited transportation choices could still make it take longer for goods to move on to the next step. Short processing time may not be enough to solve these outside problems, but it is very important for handling priority shipments (like medical supplies), getting rid of any possible backlogs, and making sure that deliveries are sent out quickly when transportation networks reopen. Keeping internal efficiency through short processing allows companies to stay strong and ready to act

quickly when conditions get better, even if its direct effect is overshadowed by outside factors during delays.

6.3.1.4 Cost-effectiveness

Cost-effectiveness holds moderate significance. It emphasizes the necessity of balancing cost-effective operations with the provision of quality service, albeit it is less impactful than express delivery. The weight indicates that brief response times are of considerable significance. Timely responses to client concerns or issues are beneficial; however, they are of lesser significance than the capacity to fulfill expedited delivery requirements. Cost-effectiveness often diminishes in significance amid major disruptions. In times of crisis, firms frequently emphasize operational continuity and financial considerations. The emphasis transitions to guaranteeing the service's functionality, even if it necessitates escalated operational expenditures (e.g., utilizing alternative paths, compensating for supplementary resources, or procuring emergency labor). However, prolonged disruptions can exert pressure on budgets, necessitating that organizations balance heightened operational expenses with the capacity to maintain these initiatives over the long run.

6.3.1.5 Short response time

The response time of a courier service is how quickly they can answer questions, deal with complaints, or fix problems with packages. This could mean answering customer service calls, changing delivery times, or fixing problems like packages getting lost or being delivered late. This variable shows how important it is to keep customers informed, and the service is quick to respond. In the CEP field, dissatisfied consumers and negative feedback can happen when communication is slow or when problems aren't dealt with. Because there is a demand for real-time, quick response times can help calm customers down, make the service better overall, and make them loyal to the brand. Advanced customer service platforms, chatbots that are controlled by AI, and tracking systems that are built in and send out updates automatically can greatly improve response times and customer satisfaction.

6.3.1.6 Efficiency of delivery agents

The efficiency of delivery agents is a somewhat significant variable. It underscores that the efficacy and productivity of delivery workers are essential for operational success, though not the predominant determinant. The efficiency of delivery agents is crucial for

the successful completion of deliveries amid external constraints. Delivery agents frequently serve as the final point of contact, and their capacity to address emerging challenges, such as obstructed roadways and alternative delivery techniques (e.g., contactless delivery), is essential. Effective delivery agents capable of adapting to swiftly changing conditions or new safety procedures are essential for successful last-mile delivery. Its significance escalates drastically during disruptions, as its function in responding to changing situations and ensuring service continuity becomes paramount.

6.3.2 Performance of CEPs across six efficiency indicators

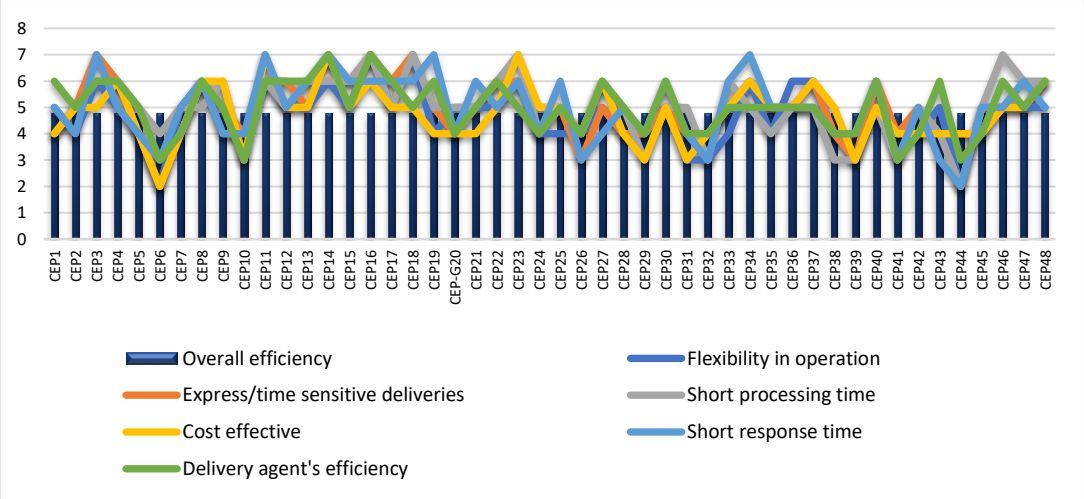

Figure 6.2 Operating efficiency of indicators

Figure 6.2 represents the performance of CEPs with respect of six efficiency indicators along with the overall operating efficiency of the industry. There are some fluctuations observed among the CEPs.

Operating efficiency of top 5 CEP service providers

- CEP16 exhibits exceptional flexibility and proficiency in express or time-sensitive deliveries, showcasing a robust ability to manage urgent consignments. Its overall efficiency positions it as a leading performer, particularly in facilitating quick processing and improved delivery agents' efficiency.
- The capacity of CEP14 to efficiently manage high-demand periods while maintaining customer satisfaction through quick and cost-effective service is

demonstrated by its exceptional performance in express deliveries and cost-effectiveness.

- CEP18 is a reliable services provider, particularly during high-demand or critical periods, due to its proficiency in express deliveries and brief processing times.
- The flexibility and rapid response times of CEP3 render it a reliable service, particularly when adaptability is necessary.
- CEP23 exhibits its capacity to efficiently manage urgent deliveries while maintaining cost control by performing well in terms of cost-effectiveness and short processing times.

Operating efficiency of bottom 5 CEP service providers

- CEP6 exhibits deficiencies in multiple areas, notably in flexibility, express delivery capabilities, and cost-effectiveness. This indicates that the provider encounters difficulties in managing urgent and cost-sensitive deliveries, which may result in diminished customer satisfaction.
- CEP44 exhibits deficiencies in short processing time and flexibility, suggesting inefficiencies in managing urgent tasks and potential service delays.
- CEP39 exhibits deficiencies in all service dimensions, notably in processing time and flexibility, indicating limited adaptability in dynamic or disruptive contexts.
- CEP41's low scores in processing time, response, and delivery efficiency indicate insufficient agility and delays in service delivery, particularly in time-sensitive situations.
- CEP32 exhibits limitations in flexibility and processing speed, suggesting a diminished capacity to manage urgent deliveries and effectively respond to unexpected disruptions.

Thus, leading CEPs demonstrate exceptional flexibility, expedited delivery capabilities, and minimal processing durations, establishing their reliability as service providers in both standard and disruptive scenarios. Bottom CEPs encounter considerable difficulties in the efficient processing and delivery of express shipments, rendering them vulnerable to disruptions or high-demand periods, which results in a decline in operating efficiency.

6.3.3 Comparison of individual OE scores of CEPs and industry average OE scores

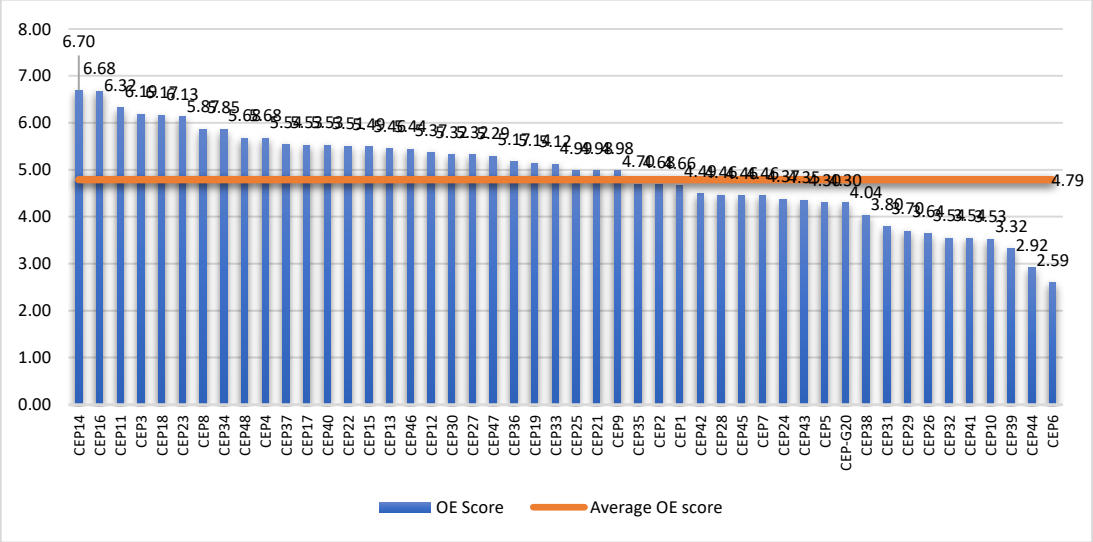

Figure 6.3 OE scores of CEP service providers vs industry average score

Figure 6.3 illustrates the operating efficiency scores for various CEPs, compared to the industry benchmark. According to the instrument's seven-point interval scale, the overall score should fall between the ranges of 1 to 7. Considering Eq. (6), the average operating efficiency score is 4.79, which implies that CEP service providers have shown a good level of efficiency during disruptive events. The operating efficiency scores range from 6.70 (the greatest for CEP14) to 2.59 (the lowest for CEP6), demonstrating that there is a significant variation in the efficiency of operations. Around 54 percent of the CEPs are performing above the industry average, and 20 percent are below the standard performance. CEPs that have OE ratings that are higher than 4.79, such as CEP14, CEP16, CEP11, CEP3, and CEP18, among others, perform better than the industry standard, suggesting that they are more efficient in their operations. CEPs that have OE ratings that are lower than 4.79, such as CEP9, CEP35, CEP2, CEP1, and CEP-G20, are performing less efficiently in comparison to the standard for the industry, which indicates that there is a need for improvement in operating efficiency. It can be seen from the distribution that the median OE score, which is represented by CEP30 and is 5.32, is slightly higher than the average score for the industry. According to this, it appears that although there are some CEPs that are exceptionally efficient, there is a sizeable proportion that falls short, particularly in the lower range (for example, CEP6 and CEP44).

6.4 Impact of operating efficiency on the business performance of CEP service providers

Operating efficiency plays a critical role in enhancing business performance, particularly in sectors like logistics and postal services, where timely and cost-effective service delivery is paramount. Key indicators of operating efficiency include flexibility in operations, express or time-sensitive deliveries, short processing and in-transit times, cost-effective services, rapid response to customer queries and conflicts, and delivery agent efficiency. Each of these factors directly contributes to the overall performance of a firm by improving service delivery, reducing costs, and increasing customer satisfaction.

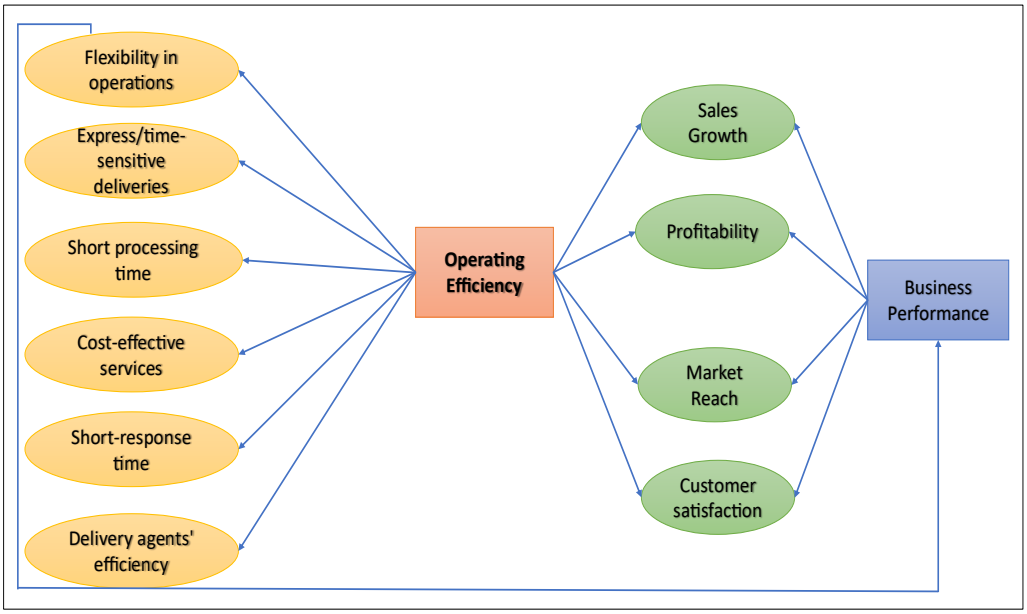

Figure 6.4 Relationship of operating efficiency and business performance

Table 6.1 Regression analysis results of business performance and operating efficiency indicators

	Business performance	*Intercept*	*Std. error*	*Beta*	*R Square*	*Adjusted R Square*
OE1	Flexibility in operation	1.098	0.127	0.788	0.457	0.445
OE2	Express/time sensitive deliveries	1.052	0.126	0.751	0.435	0.422
OE3	Short processing time	1.034	0.112	0.755	0.498	0.487
OE4	Cost effective	0.910	0.123	0.814	0.489	0.477
OE5	Short response time	1.395	0.113	0.682	0.444	0.432
OE6	Delivery agent's efficiency	0.782	0.137	0.799	0.425	0.412

Table 6.1 presents the results of regression analysis illustrating the relationship between various operating efficiency parameters and business performance. Linear regression analysis reveals that there is a positive relationship between OE indicators and CEPs'

performance. Short processing time (OE3) and cost-effective services (OE4) demonstrate elevated beta values of 0.755 and 0.814, respectively, accounting for a substantial share of variance, almost 50 percent. Operational flexibility (OE1) exerts significant influence on business performance, with a beta coefficient of 0.788, accounting for 46 percent of the variance. The efficiency of delivery agents (OE6) significantly contributes (β= 0.799), accounting for 43 percent of the variance. Express/time-sensitive deliveries (OE2) exert a considerable impact, exhibiting a Beta of 0.751 and a variation of 44 percent. The results indicate that operating efficiency considerations substantially affect business success in CEP services (Figure 6.4). The errors are rather low, suggesting that the model offers a credible assessment of the impact of these variables on business performance.

Table 6.2 Regression analysis results of OE and business performance parameters

Operating efficiency	Beta coefficients	R squared	Adjusted R Square
Sales Growth	.778	.521	.511
Market Reach	.657	.413	.400
Profitability	.922	.667	.659
Customer satisfaction	.732	.477	.465

A deeper analysis of these indicators reveals strong relationships between operating efficiency and key performance metrics such as sales growth, market reach, profitability, and customer satisfaction (Table 6.2).

- Sales Growth: Operating efficiency significantly impacts sales growth, as evidenced by a beta coefficient of 0.778. This indicates that improvements in operational flexibility, quicker deliveries, and cost-effective services are highly correlated with higher sales growth, with 52.1% of the variance explained by operating efficiency.
- Market Reach: With a beta of 0.657, operating efficiency moderately drives market reach. Efficient processes, like minimizing in-transit times and enhancing delivery agent productivity, enable firms to expand their reach and serve more customers, explaining 41.3% of market reach variation.
- Profitability: The strongest relationship is observed between operating efficiency and profitability (β = 0.922), where factors like cost-effective services and delivery agent efficiency significantly boost profitability. This link accounts for 66.7% of

profitability variation, highlighting that operational improvements directly translate into financial performance.

- Customer Satisfaction: A beta coefficient of 0.732 underscores the importance of operational efficiency in improving customer satisfaction. Factors such as fast query resolution, time-sensitive deliveries, and flexible operations ensure better service quality, explaining 47.7% of the variation in customer satisfaction.

Overall, the integration of these operating efficiency indicators enables firms to streamline their operations, adapt to market changes, and deliver superior service. This, in turn, drives key performance outcomes, particularly profitability and customer satisfaction, while also supporting growth in sales and market reach. Thus, focusing on operational improvements is essential for companies looking to enhance their competitiveness in an increasingly dynamic market environment.

6.5 Summary

This chapter's findings illuminate the strengths and shortcomings of the CEP industry at Guwahati and provide significant insights for improving operating efficiency. Around 54 percent of the CEPs are performing above the average industry score of 4.79, 20 percent are below the standard performance, and the remaining are the same as the industry average. The regression analysis reveals a positive relationship between operating efficiency and business performance.