

The Impact of Environmental Stressors on Logistics Efficiency: The Serial Mediating Role of Driving Fatigue and Cognitive Impairment Among Truck Drivers in Thailand

Ekkasit Akkarasrisawad

Graduate School, University of Thai Chamber of Commerce, Bangkok, Thailand

Pongtana Vanichkobchinda

Faculty of Engineering, University of Thai Chamber of Commerce, Bangkok, Thailand

Abstract

This research investigates the impact of environmental stressors on logistics efficiency, with driving fatigue and cognitive impairment serving as serial mediating variables. The study examined 538 truck drivers in Thailand through a structured questionnaire with validated reliability and validity measures. The collected data underwent both descriptive and inferential statistical analyses, including calculations of means, standard deviations, skewness, and kurtosis values. Concerning hypothesis testing, Partial Least Square Structural Equation Modeling (PLS-SEM) methodology was employed. The findings reveal that Thai truck drivers experience reduced logistics efficiency attributable to external environmental stressors, with effects transmitted indirectly through driving fatigue and cognitive impairment pathways. Notably, when drivers experience fatigue, this substantially influences cognitive impairment, subsequently leading to further reductions in logistics efficiency. The variance in logistics efficiency (LE) explained by environmental stressor (ES), combined with driving fatigue (DF) and cognitive impairment (CI) variables, accounts for 35.2% ($R^2 = 0.352$). Furthermore, the study demonstrates that driving fatigue and cognitive impairment function as statistically significant serial mediating variables between environmental stressors and logistics efficiency. The proposed research model exhibits predictive validity and yields significant outcomes that effectively explain the phenomena occurring within the presented conceptual framework.

Keywords

Environmental stressor, logistics efficiency, driving fatigue, cognitive impairment, truck driver.