



Improving Malaysian Automotive SMEs Operational Performance Through Lean Practices: The Moderating Effects of Human Factor Ergonomics

Norhana Mohd Aripin¹, Fatimah Mahmud¹ (✉), Khai Loon Lee¹, Suhaidah Hussain¹, and Gusman Nawaniir^{2,3}

¹ Faculty of Industrial Management, Universiti Malaysia Pahang, 26300 Kuantan, Pahang, Malaysia

fatimahm@umpsa.edu.my

² Faculty of Economics and Business, Universitas Islam Riau, Jl. Kaharuddin Nasution, Kota Pekanbaru, Riau, Indonesia

³ Scholar Zone International, Jl. Kemboja, Tobek Godang, Kota Pekanbaru, Riau, Indonesia

Abstract. Although there is evidence that implementing lean principles improve performance, many organizations still fail to achieve their goals because they neglect the human factor of human factor ergonomics. Hence, this study aims to investigate the relationship between lean implementation on operational performance and the moderating role of human factor ergonomics (i.e., physical, managerial, psychosocial, work design factors). This survey-based study was a cross-sectional study, and the samples were drawn by simple random sampling procedure from SMEs automotive manufacturers in Malaysia with the final number of 132 respondents. In total, five hypotheses were developed and tested statically using PLS-SEM through SmartPLS software. The result provided evidence that lean practices have a positive relationship on lean implementation. In addition, the moderating role of physical factors, managerial factors, and work design factors moderates the positive relationship between lean implementation and operational performance. However, psychosocial factors do not moderate this positive relationship because manufacturing often involves in standardized work, highly focus on efficiency, and must adhere to the given schedules which lead to psychosocial issue such as job satisfaction, mental workload, job stress, and psychological strain. This study contributes to expanding the boundary of the existing literature and contributes to the body of knowledge while providing insights to practitioners in tailoring strategies to integrate human factor ergonomics in their lean implementation efforts to leverage their operational performance.

Keywords: Human Factor Ergonomics · Lean Practices · Operational Performance · SMEs · PLS-SEM