

## **INFLUENCE OF MULTIMODAL TRANSPORT SYSTEM DYNAMICS ON LOGISTICS RESPONSIVENESS: AN ORDINAL LOGISTIC REGRESSION APPROACH**

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### **ABSTRACT**

Multimodal transport systems (MTS) and logistics responsiveness are vital concepts, in engineering and business disciplines, respectively. Conversely, their amalgamation in transport system developments, by the scientific community is low, and therefore, attracted few research interests. This paper aims at assessing the influence of MTS dynamics, on logistics responsiveness and modal choices, with the Ghanaian perception. Researchers adopted self-administered questionnaires and ordinal logistic regression approach. The study reviewed the broad-spectrum of logistics responsiveness, dynamics in MTS, Ghanaian systems' status quo and analysed the opinions of a set of 500 respondents, drawn from transport practitioners and customers, across the ten regional capital cities in the country. It was underscored that, efficient MTS development and management are crucial, to reduce transport cost and improve logistics responsive trade-offs. Authors found that, four modes (road, waterway, maritime and air), out of the five key systems studied, were statistically significant in influencing logistics responsiveness. Amazingly, rail system, despite its major role in MTS in economy was not statistically significant and therefore did not meaningfully influence logistics responsiveness. This irregularity is in congruence with the peculiar Ghanaian situation, as rail system is currently subjected to vicious cycle, hence contribute marginally to countrywide transport services and this was established in the study. Notwithstanding the high cost and other risks, associated with air and road transport systems, they are the most preferred combinations in MTS, as they are the well-developed transport options nationwide and this was again substantiated. Authors conclude that, there is a significant influence of MTS dynamics on logistics responsiveness and has momentous impact on modal choices. Some strategies to improve MTS for satisfying logistics responsiveness demands are stressed. Researchers recommend that, stakeholders should improve the expansion and integration of rail system into their MTS, to achieve cost-efficiency and logistics responsiveness goals.

**KEYWORDS:** Logistics Responsiveness, Modal Choice, Multimodal Transport System, Ordinal Logistic Regression