

# IDE Research Bulletin

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## **Incentives on the Road: The Impacts of Management Practices on Productivity and Accidents in the Trucking Services Industry in Thailand**

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**Paper Title** Incentives on the Road: The Impacts of Management Practices on Productivity and Accidents in the Trucking Services Industry in Thailand

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**Background and objective** The trucking services industry plays an essential role of connecting East Asian production networks, i.e., producers of raw materials, intermediate inputs, final goods, and retailers within and across industrial clusters. The quality of services of the trucking industry affects significantly efficient flow of goods and embodied technologies of goods in agriculture, manufacturing and other service sectors. Rapid industrial development has been increasing cargo traffic within and across East Asian countries. In tandem with the rapid industrial development and motorization, traffic accidents have been increasing in developing countries including ASEAN member states. Road traffic kills approximately 1.24 million people on the world's roads (WHO 2013), which are as many people as malaria does. Although the situation of road safety in developing economies is getting worse, Table 1 speaks a huge disparity in road traffic death rate between developing and developed countries, and among developing countries. For example, the rate for Thailand is almost double of the Indonesia, while the rate for Japan is much lower than these ASEAN member states (38.1 for Thailand vs. 17.7 for Indonesia vs. 3.8 for Japan). Estimated GDP loss due to road traffic death for developing economies is also higher than that for developed economies. This enormous social transportation cost indicates huge potential savings from keeping road safety for developing economies.

**Table 1: A huge gap in road traffic death rate between developing countries and selected developed countries**

Country	Estimated road traffic death rate (per 100,000 pop)	Estimated GDP loss
Thailand	38.1	3.0%
Malaysia	25.0	1.6%
Vietnam	24.7	2.9%
China	20.5	N.A.
Lao PDR	20.4	2.7%
India	18.9	3.0%
Indonesia	17.7	3.1%
Cambodia	17.2	3.5%
Myanmar	15.0	0.5%
Mexico	14.7	1.7%
USA	11.0	2.3%
Philippines	9.1	2.6%
Brunei	6.8	N.A.
Singapore	5.1	N.A.
Denmark	4.7	N.A.
Japan	3.8	1.4%

*Source:* Global status report on road safety 2013, WHO. *Note:* N.A. is not applicable.

Needless to say, the quality of roads infrastructure and road connections over land affect the formation and operation of production networks through changes in transport costs as economic geography has deeply investigated. However, we have not accumulated the scientific knowledge

about the determinants of economic efficiency and social costs that trucking services firms organizationally choose. This knowledge is particularly important for policy arena related to sustainable economic development in emerging economies facing an experience of rapid industrialization, motorization, urbanization, and rapid adoption of new production processes and technologies.

This project explores two research questions: what management practices enable trucking services firms to improve logistics services efficiency and to meet logistics market growth in Thailand; and what management practices can help improving road safety in Thailand. To study these questions, this project brings together two lines of microeconomic research approach in the context of Thailand: the qualitative case study of management technologies important for firm performances of the trucking services; and the quantitative analysis of the adoption of management practices and technologies that may affect truck drivers' behaviors and trucking services firms' and performance.

### **Method, data, and results**

To achieve research objectives, the authors conducted qualitative case studies and empirical analysis on the firm-level performance of the trucking service industry by running the unique and original survey to the trucking services companies located in the Greater Bangkok Area in Thailand. This project derives hypotheses from field interviews, tests the hypotheses by using the unique and original dataset, and shows direct evidences of bottlenecks and obstacles to improve efficiency and occupational safety in logistics services industry. The interview-based qualitative study asks the following five microeconomic questions: (1) how the trucking services providers in Thailand are prepared to meet competition and social demand for traffic safety; (2) how trucking services providers play an essential role on consignor-to-consignee matching along with production chains in Thailand; (3) which types of modern management practices/technologies are difficult for the trucking services providers to adopt; (4) what are main drivers of the disparity in the adoption of new management and technologies across the trucking services providers; (5) how the trucking services providers comply with laws, regulations, and other related acts to keep road safety. We derived testable hypotheses for empirical analysis from the interviews.

To explore an empirical content of personnel and organizational aspects of the trucking industry in Thailand, this project runs a firm-level survey to collect the information of performance measures of the trucking services providers and measures of competition, management practices, inter-firm relationship, and other firm-level basic characteristics including drivers quality and vehicle quantity. This project combined the qualitative case studies with the survey-based empirical analysis to derive some sector-specific lessons which policy planners and regulators should carefully understand about.

We chose a sampling frame from official statistics of each country to seek for representativeness of the sample and out-of-sample validation in future. I select the exact surveyed industries during writing case-based studies. Using data from firm-level survey in the Trucking industry in Thailand, we empirically examine the underlying mechanism of changes in productivity (efficiency) and accidents in the industry and test predictions of the effects of consignors and management practices suggesting policy recommendations.

This paper focuses on incentive payment scheme as main management practices in trucking industry. We then estimate the effects of incentive pay scheme on profitability, operation efficiency, and quality of services. Empirical results show the following findings: (1) an adoption of incentive scheme itself does not lead to higher profitability; (2) an adoption of incentive pay can increase profitability and efficiency as long as firms invest in firm-sponsored training for drivers; (3) a joint adoption of teamwork and training does not lead to improvement in efficiency and quality as well as profitability.

### **Policy recommendations**

Despite extensive research in trade, development, labor, and industrial organization, numerous policy-related questions remain regarding management practices in the Trucking industry in emerging economies. How much the sensitivity of road safety between foreign consignors and local consignors? How do local firms without enough capacity upgrade their productivity and

safety and find appropriate consignors? How is costly for local Trucking service providers in developing economies to engage in global production chains? Is large-scale providers always efficient and safe? How do the roles played by local and foreign consignors within a production chain differ? How international knowledge capital flows in logistics are more likely to accelerate the industrial upgrading process? How does it vary with providers-consignors-consignees links even within the same country pair? This study takes into consideration the providers-consignors relationship that may affect their decision on adopting new technologies to the domestic service providers and transferring existing technologies, as well as choosing target markets and input sources within and across borders. To answer these policy-oriented questions and broader audiences, this study can provide a set of new and concrete evidences on the impacts of management practices in the Trucking industry.

In particular, this paper derives some lessons toward detecting bottlenecks and obstacles to foster productive networks in ASEAN economies from a viewpoint of the relationship between logistics firms' capabilities and regional industrial growth. This project is also aiming to provide lessons for road safety and global health from a viewpoint of microeconomics: managerial inputs; employment conditions and incentive scheme for the truck drivers; contractual relationship between the trucking service companies, consignors, and consignees. It is very important to understand whether trucking firms are exclusively efficiency-seeking, or whether they are more profitable by seeking both efficiency and social responsibility.

The usual disclaimer applies. The concepts stated on the manuscript are full responsibility of the authors and do not necessarily reflect the opinion of the IDE-JETRO.