

論文 / 著書情報
Article / Book Information

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著者(和文)	Do BagusMuhammad Reza
Author(English)	Muhammad Reza Do Bagus
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論文要旨

THESIS SUMMARY

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学生氏名： Student's Name	Muhammad Reza DO. BAGUS		審査員主査： Chief Examiner	花岡 伸也	

要旨 (英文 800 語程度)

Thesis Summary (approx.800 English Words)

In past decades, a multitude of events related to supply chain disruption (e.g., the earthquake in Japan in 2011, global economic crises in 2011, and the current Covid-19 case) have occurred in succession, causing great losses to enterprises or even the national scale. Seaport, under global economic and supply chain integration, is also vulnerable to this event and sometimes generates a domino effect on the entire supply chain network. The vulnerability of seaports thus needs to be addressed to ensure the functionality of seaports and enhance supply chain resilience. The primary goal of this study is to develop a framework that can be useful to understand: the phenomena of the interdependency of the disruption event in the seaports; and risk appetite from their entities too. This study investigated Indonesian seaport operations related the supply chain disruption. In realization, this research started with observing the extensive literature review and risk document related to supply chain disruption from the Indonesian seaport. Furthermore, this research finds that there are 10-dimensional threat factors and 61 seaport risk factors that have clear implications to disrupt supply chain continuity - not only in Indonesia but also somewhere seaport. From both variables, this study generates four topics to narrow down the objective as follows.

The first study proposes the model to understand the central tendency between the threats factors as latent variables and the seaport risk factors as observed variables with semi-quantitative evaluation from the perspective of port authority, seaport operator, and seaport user. This study proposes a rough set-based genetic algorithm, to investigate the central tendency in seaport risk implied by supply chain threats through a questionnaire evaluation. We deploy 24 risk attributes, which threaten the proposed ten-dimensional factors, based on their risk scores. The results show that the lack of storage risk planning, low punctuality of delivery goods, and shortage of port capacity, are the "best three" of the seaport-fulcrum supply chain risk, in the context of Indonesian seaport firms.

The second study relates with the first study, where the purpose is to reveal the tendency phenomena between seaport risk factors and potential threat into a utility function. To ensure supply chain continuity, it is important to understand the interdependency between seaport risk factors and the threat of supply chain disruption. It proposes a rough set-based genetic algorithm model and adopts the hybrid-conjoint analysis concept to generate the threat utility function. It is the sum of the level of disruption by the conditional seaport risk factors influencing the satisfaction of seaport-fulcrum supply chain continuity. The results show that the seaport service process threat is the primary source of the seaport-fulcrum supply chain risk disruption in Indonesia; it reduces utility satisfaction to 32.2%, in the 100% utility estimation. This is followed by the relationship and planning process threats with 28% and 26.6% utilities, respectively.

The third study expand more further about the correlation among the seaport risk variables. The goals are to understand the interdependency factors amid the seaport-fulcrum supply chain using multivariate analysis of variance. In the results, we find 39 conditional seaport risk factors that are potentially influenced by about 21 dependent factors related to seaport-fulcrum supply chain entities. Furthermore, threats from the planning process, infrastructure, seaport service process, distribution process, financial costs of nuclear enterprises and security existed and affluent highest potential risk in Indonesia.

Lastly, the fourth study presented the risk-appetite model of the seaport-fulcrum entities. The purpose is to understand the maximum amount of residual risk (utility value) it will accept after controls and risk measurement have been put in place. This study optimizes the expected utility value of the stakeholders' preferences with the assumption that the stakeholders have different preferences about the conditional seaport risk towards the supply chain continuity without interfering with each other. Then, the risk appetite model can be estimated with the single-path

conduction analysis with coupling effect using mix integer linear programming model. In the results, the port-authority, including seaport-operator, have more tendency to commit the conditional seaport risks rather than the seaport-user either sporadic and repetitive case. It is indicated that seaport-users rely on the policy from port-authority.

Therefore, the findings in this dissertation conclude that understanding seaport entities' related supply chain is essential to formulate the policy at the planning level and technical levels. This dissertation presents the framework analysis of how to compute the interdependency of conditional seaport risks phenomena that is not only related to supply chain threat but also a correlation among the risks. Furthermore, the risk appetite model describes the seaport organization's risk capacity or the maximum amount of residual risk (expected utility value) it will accept after controls and other measures have been put in place. It represents a balance between the potential benefits of innovation and the threats, that change inevitably brings.

備考：論文要旨は、和文 2000 字と英文 300 語を 1 部ずつ提出するか、もしくは英文 800 語を 1 部提出してください。

Note：Thesis Summary should be submitted in either a copy of 2000 Japanese Characters and 300 Words (English) or 1copy of 800 Words (English).

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