

# Managing Port-Related Supply Chain Disruptions: A Conceptual Paper\*



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## Abstract

The increased importance of ports makes them a vulnerable node as a port-related disruption can generate domino effect on a network of supply chains. The vulnerability of ports thus needs to be addressed to ensure the functionality of ports and enhance supply chain resilience.

This paper synthesizes the current literature into a management model that seeks to target operational deficiencies at ports. The management model is operationalized in three tiers, from the top management level to the front-line employees, with characteristics from risk management, business continuity management and quality management theories. The proposed model serves as a universal guide in assisting port management in managing port-related disruptions and seeks to reduce the occurrences of port-related supply chain disruption threats.

**Key Words :** Risk Management, Disruption Management, Port Resilience, Management Model

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\* This paper is a revised version of two earlier papers presented at International Association of Maritime Economists Conference held in Marseille, 3-5 July, 2013 and International Forum on Shipping, Ports and Airports held in Hong Kong, 27-30 May, 2012.

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## **I. Introduction**

In recent years, supply chain disruption has become a major area of research, gaining increasing popularity. Among the numerous nodes in global supply chains, seaports play a critical role in maintaining the continuous flow of cargo between supply chain entities. Seaports have transformed its role from a traditional regional gateway to one where important value adding and complex logistics-related activities take place. The more mature phases of ports are well-developed ports acting as important players in cargo distribution. This increased integration of ports into supply chain management creates a higher level of uncertainties for downstream planning, product movement and information exchange. For that reason, risks occurring in everyday port processes are operational deficiencies which are capable of developing into augmented unsought effects in supply chains. Together with supply chain trends and practices, the likelihood of a supply chain disruption is increased as the effects of a disruption that originate from ports are easily exacerbated in today's business environment.<sup>1)</sup> The potentiality of ports to administer seamless services, operations and transfer of cargo is thus very much sought after. In other words, it is important to identify measures which the port management can implement to minimize the impact of port-related supply chain disruptions (PSCD) and reduce the occurrences of PSCD threats. PSCD threats are defined as operational risks inherent in port processes that are capable of disrupting the continuity of upstream and/or downstream supply chains. Hence, natural disasters and weather conditions that also result in disruptions are not in the scope of this study.

This paper seeks to address the above issue by way of a management model that reflects a holistic management approach for port management to implement. While there have been several studies exploring risks in port operations, there has been no studies addressing a full set of operational risks from a holistic perspective, especially in connection with supply chain disruptions. Since the introduction of containerization, the focus of research within the maritime industry revolved around improving internal operational efficiencies which does not reflect the actuality of port's integration with its peripherals. Elaborative research on general supply

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