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Could the service consumption-production interface lift national logistics performance?

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A B S T R A C T

This research contains a four layer framework which aims to identify the performance factors. The proposed model is tested and validated by 43 samples data by using variance-based SEM approach (PLS). It extends the body of research in integration and sustainable supply chain management. The four layers contain the integration factors, inland depot service quality, hauliers firms’ sustainable performance and national logistics performance. A questionnaire survey and two expert groups were deployed. Survey respondents were managers of haulage companies which made up 30% of the 140 active companies. Annual revenue for a firm ranges from Ringgit Malaysia 1.25 million to 5 million. Each firm made an average of 170 trips to the depots daily. The theoretical contributions are the validation of industry-derived integration factors and the unwitting revelation that the stakeholder theory is unfazed by the downside of the agency theory. This surprisingly confirmed depot could still influence hauliers favourably. The practical contributions are the usefulness of the integration framework questionnaire items for future haulage studies, and that depots and hauliers should collaborate to lift national logistics performance.

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1. Introduction

This study consists of a four layer conceptual framework. The framework sequentially links integration factors, depot service quality, hauliers firms’ sustainable performance, and finally the national logistics performance or the logistics performance index. The national logistics performance and the logistics performance index are used interchangeably in this study. This study was primarily triggered by the perennial problem of waiting at the depot-haulier container transaction interface (Ruban, 4th May, 2012) and the desire of the Malaysian government to achieve top ten ranking in the logistics performance index (Economic Planning Unit, 2016). The waiting for containers at the depot-hauliers interface could adversely impact the national logistics performance. This prompts two questions. First, what integration factors could influence depot service quality? Second, could depot service quality affect hauliers firms’ sustainable performance and together lift the national logistics performance? The PLS-SEM was used to answer these questions because it is able to simultaneously analyse more than one causal relationship (Lai et al., 2011; Hair et al., 2010). This study promotes the development of theories useful to supply chain management and makes recommendations to improve firms’ sustainable performance to lift national logistics performance. It also verifies the industry-derived integration factors for future use with some fine tuning. Surprisingly, the unsuspecting tension at the testy depot-hauliers interface finds the stakeholder theory is unfazed by the downside of the agency theory.

The introduction of containers has facilitated world trade growth (The Economist, May 18th, 2013) and is the driver of 20th century economic globalization (Bernhofen et al., 2012). Logistics facilitation will play a significant role in supporting higher rates of economic growth worldwide (World Economic Forum, 2013). Malaysia is no exception to these phenomena (Tarudin, 2013). Containers are predominantly used because they facilitate inter-modal transport between sea, air and land (World Shipping Council, History of Containerization, 2016). In Malaysia, the most visible and frequent actor in the inland logistics supply chain are the road hauliers (Nasir, 2014) and they have a very important role to move containerized goods for economic value-adding processes along the supply chain. With logistics as the backbone of the economy (Arvis et al., 2014), hauliers are expected to contribute to the overall national logistics performance. This is because inland container
freight movement is initiated by the shipper who instructs the freight forwarder to arrange for an empty container. The freight forwarder informs the haulier to pick up the container at the depot to be delivered to the shipper. At the depot, the haulier would queue to receive the container. This service interface is non-contractual.

This depot-hauliers interface perennially experiences queuing (Ruban, 4th May, 2012) and is serious enough to threaten the triple bottom line of depots and hauliers. Compounding this situation is the fact that hauliers must pick up the empty container only from a particular depot as directed by the ship liner. This is primarily due to the matching of shipper’s schedule with the schedule of port-of-call of liners. This is the nature of haulage business (World Shipping Council, How liner shipping works, 2016).

In a container transaction, it is fairly remote for the depot operators to work in the best interest of the immediate customers, the hauliers. This is because of the agency theory and the transaction between the depots and hauliers is non-contractual. If the depot-hauliers transaction is not fully collaborated, the introduction of integration factors is suggested in this study to mitigate the situation and convey a positive chain effect to national logistics performance.

With most studies showing integrative efforts directed towards the first-tier supplier or customer (Lin and Tseng, 2014; Murphy and Richard, 2003; Tseng, 2009), hauliers should focus on external integration to support the haulage functional competitive capabilities (Mackelprang et al., 2014). As such, two expert groups of hauliers were deployed to formulate the integration factors. These factors would be tested to determine if they could influence the service quality of depot operators, hauliers’ sustainable performance and national logistics performance.

Past supply chain research addressed several performance issues related to the impact of integration (Flynn et al., 2010; Mackelprang et al., 2014), supplier relationships (Pragio and Olhager, 2012), intra- and inter-organizational performance (Schmitz and Platts, 2004), and reverse logistics (Richey et al., 2005). This study addresses performances which are located at the backend of the framework. They are the hauliers’ performance and national logistics performance or the logistics performance index (or in short, index.) The competitive index comprises six measures used in ranking national logistics performance. While the World Bank (Arvis et al., 2014) publishes the index, it still recommends “researchers to take on a deeper, finer, country-specific assessment of the determinants of logistics performance” (Arvis et al., 2014). This country-specific research by the authors will complement the World Bank logistics report. In doing so, it attends to three major practical issues. It is a search for factors to mitigate the perennial queuing problems encountered at the depot-hauliers interface (Ruban, 4th May, 2012); to address the decline in logistics productivity (Wong et al., 2015) and the difficult to manage sustainability of operations management (Wong and Wong, 2014). In sum, this research seeks to determine the integration factors that could effectuate a chain effect from depot to hauliers to enhance the Malaysian logistics performance index ranking prescribed in the Eleventh Malaysia Plan, 2016–2020.

This paper is organized as follows. Section 2 contains literature review; Section 3 methodology; Section 4 results; Section 5 implications; and Section 6 conclusions.

2. Literature review

This section contains literature relevant to the variables in this study. It is intended to develop understanding of the variables at hand, refine the research questions, identify information that should be gathered and identify sources for questionnaire items (Cooper and Schindler, 2011). In addition, two major theories – the stakeholder theory and agency theory – provide the ligaments to these variables are also discussed. This section concludes with hypotheses development.

2.1. Integration factors

The objective of integration is to achieve operational efficiencies and strategic effectiveness in the supply chain through collaboration (Richey et al., 2010). Therefore, supply chain integration is to coordinate planning and realization processes by providing the right information to the right decision-maker ensuring overall coordination (Andersson et al., 1989). Incidentally, strategic supply chain integration does not have a universally accepted definition (Mackelprang et al., 2014; Ahi and Searcy, 2013). Instead, it is broadly associated with the level to which a firm strategically links and aligns processes with suppliers and customers (Zhao et al., 2010; Jayaram and Tan, 2010).

Flynn et al. (2010) define supply chain integration as “the degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organizational processes in order to achieve effective and efficient flows of products and services, information, money and decisions providing maximum value to the customer.” Based on the preceding, supply chain integration (SCI) encompasses information flow, materials or goods or services flow (physical flow), and cash flow. These three flows collectively shape SCI (Zolait et al., 2010; Rai et al., 2006). From the context of this study, SCI was conceptualized as having only two flows which is information flow, and material or goods or service flow (physical flow). Even though SCI consist of financial or cash flow, it was intentionally left out as there was no cash flow between the depots and hauliers. As such, due to the context of this study, cash flow is set aside.

In order to differentiate SCI which consist of three dimensions and this study which only covers two dimensions which are information flow, and material or good or services flows (physical flow), the SCI conceptualization is named as integration factors. Integration factors consist of two dimensions which are information flow and material flow which collectively shape SCI in this research.

In this study, integration factors play the role of an independent variable.

2.2. Depot operator service quality

Service quality was introduced to industrial marketing in the 1980s by the likes of Lovelock (1983), Grönroos (1984), Parasuraman et al. (1985), and later Bienstock et al. (1997), Mentzer et al. (1999) and Mentzer et al. (2001). Parasuraman et al. (1985) introduced the service quality gap to indicate the shortfall of customer perception vis-a-vis expectation. Bienstock et al. (1997) subsequently extended the concept of the delivery of intangible services to include the delivery of tangibles. They call this physical distribution service quality (PDSQ). It consists of timeliness, availability and order condition. The PDSQ model shows the distinction between technical quality and functional quality of Grönroos (1984). Technical quality denotes service outcome and functional quality the service delivery process. Mentzer et al. (1999) and Mentzer et al. (2001) view PDSQ as an important component in the broader concept of logistics service quality (LSQ). Subsequently, they included PDSQ in their LSQ research.

The LSQ in Mentzer et al. (1999) is a second order construct consisting of nine dimensions. However, Mentzer et al. (2001) rearranged these nine dimensions into two major processes. The first process, order placement, has personnel contact quality, order release quantities, information quality and ordering procedures. The second process, order receipt, has order accuracy, order condition, order quality, order discrepancy handling, and timeliness.
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