

# Moderating Effect of Government Regulation on Supply Chain Collaboration and Firm Performance

**Engkos Achmad Kuncoro, Darjat Sudrajat, Hardijanto Saroso and Dicky Hida Syahchari**

Management Department, BINUS Business School Undergraduate Program

Bina Nusantara University

Jakarta, Indonesia

[eak@binus.edu](mailto:eak@binus.edu); [darjat.sudrajat@binus.edu](mailto:darjat.sudrajat@binus.edu); [hardijanto.saroso@binus.edu](mailto:hardijanto.saroso@binus.edu);

[dicky.syahchari@binus.edu](mailto:dicky.syahchari@binus.edu)

**Dennis Moeke**

HAN University of Applied Sciences

Netherlands

[Dennis.Moeke@han.nl](mailto:Dennis.Moeke@han.nl)

## Abstract

Reducing dwelling time in Indonesia is an urgent matter to reduce national logistics cost. In line with that, one of key government programs is through strengthening the role of dry port firms in supporting seaport particularly in import activities. The aim of study was investigated the role of government (logistics) regulation in moderating the effect of supply chain collaboration on dry port firm's performance. The study used causal, quantitative, or cross-sectional survey method. The data collection conducted by using questionnaires with purposive sampling technique. The sample size consisted of 55 respondents that constitute stakeholders of dry port company. In this study, it was used SEM-PLS software for processing the data. The results showed that the government (logistics) regulation had positive and significant role in moderating the effect of supply chain collaboration on dry port firm's performance. The result's implication and limitation were further discussed in this study.

## Keywords

Supply Chain Collaboration, Government Regulation, Firm Performance, Dry Port Operations

## 1. Introduction

The logistics cost in Indonesia is still high in Southeast Asia, which is around 23% of GNP. Therefore, Indonesia's logistics performance index is still below Malaysia, Thailand, and Singapore. One of the priority programs of the Indonesia Government is to reduce the logistics costs by reducing dwelling time, which is the time calculated from the time imported containers are unloaded from the vessel to the containers leaving the port. Dwelling time in Indonesia is still around 4-5 days and is the slowest dwelling time in ASEAN. Whereas dwelling time in Malaysia and Singapore is only 1 day, while in Thailand and Vietnam it is around 1-2 days (Masita, 2016). The losses arising from the dwelling time performance are estimated at around IDR 740 trillion (Aditya, 2016). One of the causes of the slow dwelling time is the overlapping logistics regulations (Pandjaitan, 2016).

One of the government's strategies to reduce dwelling time is through optimization of dry ports, namely inland container terminals as "extended gates" for seaports where the issuance of imported containers can be directly executed without prior customs processing at the seaport but carried out at the dry port so that the delivery process can be faster and easier as well. The government itself hopes that the dry port operation can reduce dwelling time by up to 2 (two) days. However, this condition has not been realized as expected due to various factors. PT Cikarang Dry Port, as one of the best performing dry ports among other dry ports in Indonesia, has only contributed to the loading and unloading volume at Tanjung Priok Port by 18%, still far from the initial expectation of 60% (Yulianti et al., 2019). According to Bahagia (2016), optimizing the role of dry ports in improving the national logistics system has so far not been implemented because it is not supported by proper regulations. So far, it is still left to the free market

mechanism. Apart from the government as the regulator, in this logistical activity many parties are also involved (port operators, freight forwarders, trucking, shipping, customs, etc.), so that reducing dwelling time, dry port firms also depend on the commitment of each stakeholder. Based on these conditions, the research problem is does government regulations moderate the effect of supply chain collaboration on the performance of dry port companies?

### 1.1 Objectives

The objective of the research is to determine the impact of government regulations in moderating the effect of supply chain collaboration on the performance of dry port companies.

## 2. Literature Review

Dry port constitutes an inland location as an inland intermodal terminal or logistics center that is directly connected to seaport (s); provide storage, customs, and formalities services for international shipments (Roso et al., 2019; Lau et al., 2019). Some of the advantages of using a dry port are an increase in trade flows that provide benefits both regionally and for the country as a whole; reduce the cost of transporting goods; eliminating processing of documents that sometimes causes goods to be stuck at seaport; less disruption to the road network if transport is by rail. Important aspects that play a role in developing dry port companies' competitive advantage include on-dock rail, reliable inland connection, and a functional inland intermodal facility (Bentaleb et al., 2015; Nguyen and Notteboom, 2016; Khaslavskaya and Roso, 2020).

Supply chain collaboration is the process of two or more firms or organizations work together to achieve shared objectives in a way that increases the overall supply chain value (Banomyong, 2018; Burnette and Dittman, 2018). Supply chain collaboration is carried out between organizations encompasses between supply chain functions and other business functions, members of the firms supply chain and other firms in the supply chain from upstream to downstream, two different firms or supply chains to create a scale advantage. Key aspects of supply chain collaboration comprise information sharing, trust, decision synchronization, incentive alignment, and resource sharing (Banomyong, 2018; Cao and Zhang, 2011; Soosay and Hyland, 2015; Mofokeng and Chinomona, 2019). Managing the supply chain is one of key factors of sustainable firm performance (Civelek and Cemberci, 2015). Firm's performance refers to how far a firm do actions efficiently and effectively (Bititci, 2015). Efficiency relates to the amount of resources used to get a result or output. Whereas effectiveness relates to the degree to which the results of an action fulfil the specifications, requirements, and expectations that have been set. Company's performance is all aspects that a company provides to interested parties in financial and operational terms, which can be evaluated through measures such as net operating profit, return on capital employed, total returns to shareholders, net operating costs, and stock turn (Keller and Schaninger, 2019). In addition, company performance based on balance scorecard concept can be measured through four aspects, namely financial, customer, internal (operational) processes, and learning or growth (Dudic et al., 2020; Fatima and Elbanna, 2020; Kaplan and McMillan, 2020). Government regulation refers to legislations or regulations established by President to carry out the laws properly. Government regulation in logistics aspects try to plan, facilitate, implement, monitor, and control the flow and storage of goods in and between logistics systems that are utilized by firms, organizations, agents, or governments with the aim of increasing competitive advantage, efficiency, and fairness. The important aspects relate on the government regulation include availability, synchronization, transparency, and benefits (Mutiarin et al., 2019; Kitching et al., 2015; Karassin and Bar-Haim, 2019; Chakraborty, 2016). In the dry port operation, the laws and regulations encompass No 23/2007 about railways, No 17/2008 about shipping, No 22/2009 about traffic and road transport, and No 1/2009 about airline, No 69/2001 about port operation, No PM 6/2013 about port service rates, etc.

Supply chain collaboration has a positive and significant effect on company performance (Doganay and Ergun, 2017; Panahifar et al., 2018; Um and Kim, 2017; Al-Doori, 2019; Shahbaz et al., 2018). In line with that the first research hypotheses (H1) is that supply chain collaboration has a positive and significant effect on firm's performance. Government regulations can moderate the relationship between variables (Maina, et al., 2015; Oyelakin and Kandi, 2017). Therefore, the second research hypotheses (H2) is that regulation moderates the effect of supply chain collaboration on dry port firm's performance.

## 3. Methods

This research constituted a cross-sectional survey, quantitative, or causal methods (Sekaran and Bougie, 2016; Bordens and Abbott, 2018). The unit of analysis was organization (dry port firm's stakeholders: port operators, freight

forwarders, shipping lines, shipper, trucking, etc.), whereas the unit of observation was the firm's leaders (managers, senior managers, and directors). The data collection used questionnaires with purposive sampling and then processed by SEM-PLS software. The sample size consisted of 55 companies. Data validity was measured by average variance extracted (AVE) and loading factors. Whereas the data reliability was measured by composite reliability (CR) and Cronbach's Alpha. In this research used significance level ( $\alpha$ ) 0.05 (Hair et al., 2019; Hair et al., 2017).

Supply chain collaboration was as independent or exogenous variable with five indicators, consist of information sharing, trust, decision synchronization, incentive alignment, and resource sharing ((Banomyong, 2018; Cao and Zhang, 2010; Soosay and Hyland, 2015; Mofokeng and Chinomona, 2019). Firm's performance was as dependent or endogenous variable was measured by four indicators consist of financial, operational, customers, and employees' competence (Keller and Schaninger, 2019; Dudic et al., 2020; Fatima and Elbanna, 2020; Kaplan and McMillan, 2020). The government regulation was as moderating variable measured by four indicators, namely consist of availability, synchronization, transparency, and benefits (Mutiarin et al., 2019; Kitching, Hart, Wilson, 2015; Karassin and Bar-Haim, 2019; Chakraborty, 2016). The research model has thirteen indicators overall.

#### **4. Data Collection**

The data collection used questionnaires with purposive sampling technique. The sample size consisted of 55 companies as stakeholders of dry port firms in Indonesia (Jakarta, West Java, and Banten Provinces). The stakeholders consisted of seaport operators, railways operator, shipping lines, freight forwarders or logistics service providers, shippers (exporters or importers), and trucking firms. The data collection conducted in November-December 2020.

#### **5. Results and Discussion**

Based on the processing data with SEM-PLS, the results indicated that all measurements or instruments have good validity and reliability. The validity was showed by average variance extracted (AVE) score higher than 0.5 and loading factors higher than 0,7. Whereas the reliability was showed by Composite Reliability (CR) score higher than 0,7 and Cronbach's Alpha score higher than 0,7. Generally, the hypothesis tests showed that the government regulation had positive and significant effect in moderating the effect of supply chain collaboration on performance of dry port firm ( $t$ -statistic 2.308 >  $t$ -table 1.96). The results of this study are in accordance with figure 1 and 2.

Generally, dry port firms must collaborate with other parties (port operators, trucking companies, freight forwarders or logistics service providers, railway operator, customs, etc.) in running their activities. Some operators of key logistics infrastructures in Indonesia were constitute state owned companies so that many government regulations are used as a reference in their operationalization, including in collaborating with their stakeholders. Therefore, the availability of effective, integrated, transparent, and useful regulations were very important in strengthening supply chain collaboration of dry port business in Indonesia. In addition, other regulations concerning export-import activities, especially regarding prohibitions and restrictions (LARTAS) are still too many and some overlapping, thus hampering the process of releasing goods from seaport. Without conducive regulations, the optimization of the dry port role will not be able to run optimally to reduce dwelling time at the seaport (Tanjung Priok) and support the improvement of the national logistics system.

Currently, there are no specific regulations that can strengthen the role of the dry port as a support for the seaport (Port of Tanjung Priok), so the operation of the dry port is completely depend on the market mechanism. This has an impact on the performance of these companies which is not optimal, even some dry port companies are no longer active. In connection with that, the existence of appropriate and conducive regulations will greatly encourage or strengthen collaboration among each stakeholder so that it has a positive impact on improving the performance of these companies. In addition, synchronization of this regulation with other regulations, especially regulations of import activities, is also very important in order that speed up the process of releasing goods from seaport to dry port and from dry port to consignee. Another important aspect of the regulation is transparency, wherein the drafting process must involve all stakeholders to avoid the existence of regulations that hinder or harm the stakeholders themselves. In the beneficial aspects of the regulation, it should be taken into consideration because the more useful a regulation is for each stakeholder, the more effective the regulation will be. These benefits must reflect the total value received by each stakeholder. In the context of supply chain collaboration of the dry port industry, existing regulations must strengthen or encourage aspects of information sharing, trust, decision synchronization, incentive alignment, and resource sharing. So that existing or future regulations will be able to form a supply chain collaboration of dry port companies that encourage the ease and speed of each stakeholder in providing required information or data; provide mutual trust on each party's rights and obligations; provide synchronization of each stakeholder in decision making; provide mutually agreed on each party's costs, risks, and benefits; encourage shared the use of our resources

(technology, equipment, fleet, land, etc.). Appropriate and conducive government regulations will strengthen the supply chain collaboration in enhancing improvement of dry port firms' performance including finance, customers, internal operations, and employee's competence.

### 5.1 Numerical Results

Table 1. Construct Reliability and Validity

Description	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Moderating	1.000	1.000	1.000	1.000
PERF	0.728	0.733	0.830	0.551
REG	0.843	0.888	0.892	0.675
SCC	0.837	0.839	0.885	0.607

### 5.2 Graphical Results

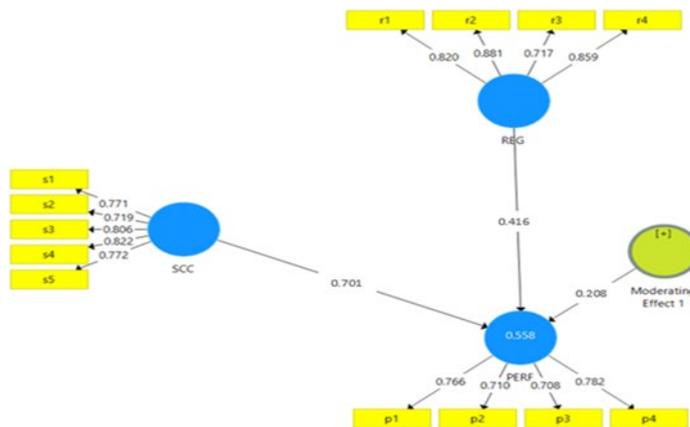


Figure 1. PLS-Model (Standardize)

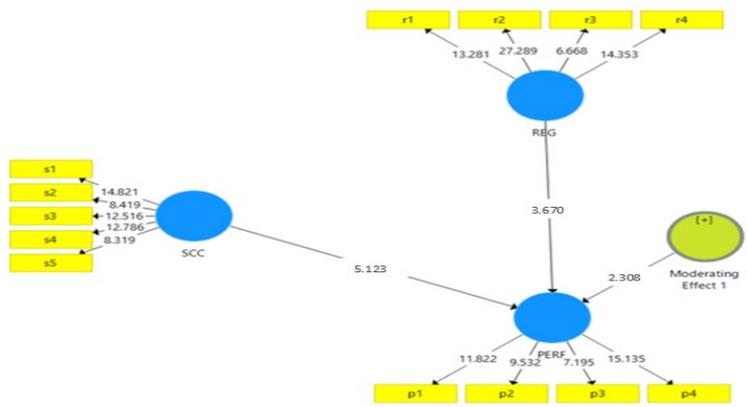


Figure 2. PLS-Model (t-statistic)

### 5.3 Proposed Improvements

The hypothesis tests showed that the government regulation had positive and significant effect in moderating the effect of supply chain collaboration on performance of dry port firm (t-statistic 2.308 > t-table 1.96). In strengthening the logistics regulations including dry port regulations, the government need consider a logistics law (particularly in dry port operations) instead of government regulation only so that in line with derivative regulations such as Law no. 23/2007 on railways, Law no. 17/2008 about shipping, Law no. 1/2009 concerning aviation, and Law no. 22/2009 on traffic and road transportation. In connection with the regulations in the logistics sector which is still conceived by sectoral approach and the existence of several overlapping regulations between the central government and local governments that could potentially cause problems in growth and legal certainty, the improvements needed in the future are to harmonize the logistics regulations in every sector and between central and local governments. The conditions will have an impact on coordination, harmony, and integration of the various aspects involved in logistical activities. Therefore, a strong governance is needed to support the effective coordination, in order that harmonize and integrate all policies for the development of the national logistics system. In this regard, it is necessary to consider the existence of a national logistics council which functions as a coordinator, integrator, and regulator in realizing an integrated, effective, and efficient national logistics system.

### 5.4 Validation

Tabel 2. Outers Loading

Description	Moderating Effect 1	PERF	REG	SCC
SCC*REG	0.960			
p1		0.766		
p2		0.710		
p3		0.708		
p4		0.782		
r1			0.820	
r2			0.881	
r3			0.717	
r4			0.859	
S1				0.771
S2				0.719
s3				0.806
s4				0.822
s5				0.772

## 6. Conclusion

The government regulation had positive and significant effect in moderating the effect of supply chain collaboration on performance of dry port firm. The important indicators of supply chain collaboration consisted of incentive alignment, decision synchronization, resource sharing, information sharing, and trust. Whereas the important indicators of government regulation consisted of synchronization, benefits, availability, and transparency.

## References

- Aditya, A. Dwelling Time Sebabkan Rugi Rp740 Triliun, Presiden Awasi Terus, Available: <https://ekonomi.bisnis.com/read/20160222/98/521498/dwelling-time-sebabkan-rugi-rp740-triliun-presiden-awasi-terus>, February 22, 2016.
- Al-Doori, J. A., The Impact of Supply Chain Collaboration on Performance in Automotive Industry: Empirical Evidence, *Journal of Industrial Engineering and Management*, 12(2), pp. 241-253, 2019.
- Bahagia, S., Pakar: Tanpa Regulasi Mendukung, Optimalisasi Dry Port Sulit Terwujud, Available: <https://ekonomi.bisnis.com/read/20161107/98/599949/pakar-tanpa-regulasi-mendukung-optimalisasi-dry-port-sulit-terwujud>, November 7, 2016.
- Banomyong, R., Collaboration in Supply Chain Management: A Resilience Perspective: Discussion Paper. *International Transport Forum*, 2018.
- Bentaleb, F., Mabrouki, C. and Semma, A., Dry Port Development: A Systematic Review, *Journal of ETA Maritime Science (JEMS)*, 3(2), pp. 75-96., 2015.
- Bititci, U. S., *Managing Business Performance: The Science and the Art*, John Wiley & Sons, Ltd., West Sussex, 2015.
- Bordens, K. S. and Abbott, B. B., *Research design and methods: A process approach*, Tenth Edition, McGraw-Hill Education, New York, 2018.
- Burnette, M. and Dittman, P., *End to End Supply Chain Collaboration: Best Practices*, A White Paper by The University of Tennessee, Knoxville, 2018.
- Chakraborty, P., Effect of Environmental Regulation on a Firm's Performance: Evidence from a Policy Experiment, *Economic & Political Weekly*, Vol. LI No. 24, 2016.
- Cao, M. and Zhang, Q., Supply Chain Collaboration: Impact on Collaborative Advantage and Firm Performance, *Journal of Operations Management*, 29, p.p. 163-180, Elsevier B.V., 2011.
- Civelek, M. E. and Cemberci, M., *Key Factors of Sustainable Firm Performance: A Strategic Approach*, the University of Nebraska-Lincoln Libraries, USA, 2015.
- Doganay, A. and Ergun, S., The Effect of Supply Chain Collaboration on Supply Chain Performance, *Journal of Management, Marketing and Logistics (JMML)*, Volume 4, Issue 1, pp. 30-39, 2017.
- Dudic, Z., Dudic, B., Gregus, M., Novackova, D., and Djakovic, I., The Innovativeness and Usage of the Balanced Scorecard Model in SMEs, *Sustainability*, 12, 3221, 2020.
- Fatima, T. and Elbanna, S., Balanced scorecard in the hospitality and tourism industry: Past, present, and future, *International Journal of Hospitality Management*, 91, 102656, 2020.
- Hair Jr., J. F., Black, W. C., Babin, B. J. and Anderson, R. E., *Multivariate Data Analysis*, Eight Edition, Cengage Learning EMEA, UK, 2019.
- Hair Jr., J. F., Hult, G. T. M., Ringle, C. M. and Sarstedt, M., *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Second Edition, SAGE Publications, Inc., USA, 2017.
- Kaplan, R. S. and McMillan, D., *Updating the Balanced Scorecard for Triple Bottom Line Strategies*, Working Paper 21-028, Harvard Business School, 2020.
- Karassin, O. and Bar-Haim, A., How Regulation Effects Corporate Social Responsibility: Corporate Environmental Performance under Different Regulatory Scenarios, *World Political Science*, DE GRUYTER, 2019
- Keller, S. and Schaninger, B., *Beyond Performance 2.0: A Proven Approach to Leading Large-Scale Change*. John Wiley & Sons, New Jersey, 2019.
- Khaslavskaya, A. and Roso, V., Dry ports: research outcomes, trends, and future Implications, *Maritime Economics & Logistics*, Vol. 22, pp. 265-292., 2020.
- Kitching, J., Hart, M., and Wilson, N., Burden or benefit? Regulation as a dynamic influence on small business performance, *International Small Business Journal*, Vol. 33(2), p.p. 130-147, 2015.
- Lau, Y., Ng, A.K.Y., and Acevedo, J., *Principles of Global Supply Chain Management*, Anthem Press, London, 2019.

- Maina, K. E., Geoffrey, M. G., Wanjau, K. L. and Mung'atu, J. K.: Moderating effect of government regulations on the relationship between cost recovery and financing of water investments in Nairobi peri-urban markets in Kenya. *International Academic Journal of Economics and Finance*, 1 (4), pp. 14-31, 2015.
- Masita, Z., Penyebab Dwelling Time di Indonesia Terlama di ASEAN, Available: <https://bisnis.tempo.co/read/752940/ini-penyebab-dwelling-time-di-indonesia-terlama-di-asean>, March 12, 2016.
- Mofokeng, T. M. and Chinomona, R., Supply chain partnership, supply chain collaboration and supply chain integration as the antecedents of supply chain performance, *South African Journal of Business Management*, Vol. 50 (1), 1193, p.p. 1-10., 2019.
- Mutiarin, D., Nurmandi, A., Jovita, H., Fajar, M., and Lien, Y., How do government regulations and policies respond to the growing online-enabled transportation service (OETS) in Indonesia, the Philippines, and Taiwan? *Digital Policy, Regulation and Governance*, Vol. 21, No. 4, p.p. 419-437, 2019.
- Nguyen, L.C. and Notteboom, T., A Multi-Criteria Approach to Dry Port Location in Developing Economies with Application to Vietnam, *The Asian Journal of Shipping and Logistics*, Vol. 32 (1), pp. 023-032, 2016.
- Oyelakin, O. and Kandi, U. M.: The moderating role of government policies on the relationship between technology, innovation, and entrepreneurship development in Nigeria: A Partial least square approach, *Universal Journal of Management*, 5(10), pp. 477-484, 2017.
- Panahifar, F., Byrne, P.J., Salam, M. A., and Heavey, C, Supply chain collaboration and firm's performance: The critical role of information sharing and trust, *Journal of Enterprise Information Management*, Vol. 31, Issue: 3, pp.358-379, 2018.
- Pandjaitan, L., Luhut: Tumpang Tindih Regulasi Masih Jadi Masalah Konektivitas Nasional, Available: <https://www.gatra.com/detail/news/213288-tumpang-tindih-regulasi-masih-jadi-masalah-konektivitas-nasional>, August 26, 2016.
- Roso, V., Rusell, D., and Rhoades, D., Diffusion of Innovation Assessment of Adoption of the Dry Port Concept, *Transactions on Maritime Science*, Vol. 3, 26–36, 2019
- Sekaran, U. and Bougie, R., *Research methods for business: A skill-building approach*, Seventh Edition, John Wiley & Sons Ltd., UK, 2016.
- Shahbaz, M. S., Rasi, R.Z.R.M., Ahmad, M.F.B., and Sohu, S., The impact of supply chain collaboration on operational performance: Empirical evidence from manufacturing of Malaysia, *International Journal of Advanced and Applied Sciences*, 5 (8), pp. 64-71, 2018.
- Soosay, C.A. and Hyland, P., A decade of supply chain collaboration and directions for future research, *Supply Chain Management: An International Journal*, Vol. 20 Issue: 6, pp.613-630., 2015.
- Um, K. and Kim, S., The effects of supply chain collaboration on performance and transaction cost advantage: The moderation and nonlinear effects of governance mechanisms, *International Journal of Production Economics*, pp. 1-15, 2017.
- Yulianti, F., Astuti, M.D., and Oktafiani, A., Faktor-Faktor Sukses Pemilihan Lokasi Pembangunan Dry Port di Indonesia, *Jurnal Ilmiah Teknologi Informasi Terapan*, Vol 6 No 1, 2019.

## Biography

**Engkos Achmad Kuncoro** is an Associate Professor and Vice Rector of Academic Development, Bina Nusantara University, Jakarta, Indonesia. He earned Bachelor of Management, Master of Management, and Doctoral in Education Administration and Management. He has published journal and conference papers (scopus). His research interests include strategic management, competitiveness, and logistics service.

**Darjat Sudrajat** is a Senior Lecturer and Head of Business Management Program, Bina Nusantara University, Jakarta, Indonesia. He earned Bachelor of Production Management, Master of Business Administration Technology, and Doctoral in Management (Innovation & Entrepreneurship). He has published journal and conference papers (scopus). His research interests include logistics service, service management, supply chain management, and strategic management. He earned international certification in supply chain management (CSCA & CSCM) from ISCEA-USA. He once worked for some logistics service companies with various managerial positions for 15 years.

**Hardijanto Saroso** is a Senior Lecturer and Dean of BINUS Business School Undergraduate Program, Bina Nusantara University, Jakarta, Indonesia. He earned Bachelor of Electrical Engineering, Master of Business Management and Applied Finance, and Doctoral in Strategic Management. He has published journal and conference papers (scopus). His research interests include strategic management, and supply chain management.

**Dicky Hida Syahchari** is a Senior Lecturer at Management Department, Bina Nusantara University, Jakarta, Indonesia. He earned Bachelor of Geological Engineering, Master of Management, and Doctoral in Management. He has published journal and conference papers (scopus). His research interests include human resource management and strategic management.

**Dennis Moeke** is professor of the research group Logistics & Alliances at the HAN University of Applied Sciences, Netherlands. The research of the group is centered around Sustainable Logistics, Healthcare Logistics, Data Driven Logistics and Human Capital in Logistics. In addition, Dr. Moeke is board member of the National Centre of Expertise Logistics (KennisDC Logistiek), which is a long-term collaboration between nine Dutch Universities of Applied Sciences with aim of developing and sharing logistics expertise in support of education and practice improvement.