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Determining supply chain practices of vehicle manufacturers in South Africa

IM AMBE (University of South Africa)

Abstract
This article explores the extent to which supply chain practices are implemented by light vehicle manufacturers in South Africa and determines whether there are differences with reference to supply chain practices between manufacturers of different origin (parent companies) in South Africa. A survey was conducted on light vehicle manufacturers in South Africa, using face-to-face questionnaire based on purposive sampling technique. Data was analysed descriptively using Statistical Package for Social Sciences (SPSS) and the findings reveal that overall, light vehicle manufacturers implemented supply chain practices to a great extent. The most highly implemented practices were "building long-term relationships", "cooperation to improve process" and "collaboration on new product development". "Sharing supply chain risk" was the least implemented across the inbound, outbound and internal supply chain. The article also revealed that in few of the best practices, differences were found between manufacturers of European and Asian parent company origin (parent companies of origin).

Key phrases
automotive industry; manufacturers; South Africa; supply chain practice

1. INTRODUCTION

Therefore, developing a superior supply chain practices is critical to the success of organisations. In light of SCM been a source of competitive advantage, organisations today are revisiting and reinforcing their supply chain practices (Schwarz 2008:1). Effective and efficient supply chain practices rest upon collaboration and coordination of processes; transparent and accessible information sharing, faster response and the creation of virtuous cycle of increased trust and confidence which leads to more collaboration (Gill 2008:2). Ul-Haq & Nadeem (2010:9) highlighted that organisations have gone through a number of changes, tactics, and operation with the goal of matching the market needs.

SCM practices according to Li *et al.* (2006:108) encompass supplier partnership, customer relationship and information sharing. Donlon (1996:54) stated that outsourcing, supplier partnership, information sharing, cycle time, compression and continuous process flow, as a

part of SCM practices. The key aspects of SCM practices according to Tan, Lyman & Wisner (2002:2) are supply chain integration, information sharing, customer service management, geographic proximity, and JIT capabilities. Thus, there are diverse views on SCM practices from a variety of different perspectives with a common goal of ultimately improving organisational performance and gaining competitive advantage.

In the automotive industry for example, differences in approach to supply chain practices have been observed between manufacturers and of different origin (Gill, 2008:2). The foundation of supply chain practices by Henry Ford who laid the modern-day mass production techniques, was based on the inter-changeability of components on the moving assembly line (Miemczyk & Holward 2008:21), then General Motors (vision of Alfred P. Sloan), based on decentralized organizational structure (Holweg 2008:15).

After the post-war period, Japanese automotive manufacturers (especially Toyota) came up with lean production models, and based on their supply chain culture gave tough competition to rivals in USA and Europe (Ul-Haq & Nadeem 2010:10). The success of Japanese firms such as Toyota and Honda in global competition came from their unique SCM practices. Park, Krishnan, Chinta, Assudani & Lee (2012: Internet) alluded that an examination of SCM practices among Chinese firms reveals the unique approach of Chinese managers to SCM practices and performance outcomes (Park *et al.* 2012: Internet).

Cultural diversities and strategies of organisation also play an instrumental role in planning the supply chain. Manufacturers of origin from Japan for instance import significant proportion of material from within (Japan), and thus have a lower content of local sourcing from a comparatively smaller supply base compared to European and American manufacturers (Miemczyk & Holward 2008:21). Asian manufacturers of origin such Toyota give preference to groups and place group interests above their own individual interests due to uncertainty reduction in relationships compared to American manufacturers such as Ford which minimise social interdependence in their interactions with others (Griffith, Myers & Harvey 2006:1). It is worthwhile to note that since the late 70s, European automotive manufacturers have adopted best practices from their Japanese counterparts, realising shorter throughput times, inventory levels, shorter cycle times, but also by the much higher quality of the products (De Koster & Shinohara 2006:2). Hence, the great emphasis and achievements of Japanese vehicle manufacturer often strike Europeans and Americans as remarkable.

De Koster and Shinohara (2006:2) reported that, a study conducted in the Netherlands (2001) on local manufacturers indicated that there was no significant performance difference between Japanese (Asian) vehicle manufacturers and European manufacturers of origin. In

light to the background discussed, this paper explores the extent to which supply chain practices are implemented by light vehicle manufacturers in South Africa and determines whether there are differences with reference to supply chain practices between manufacturers of different origin (parent companies) in South Africa. The South African automotive industry is made up of multinational companies of Asian, American and European origins. Given that there is lack of empirical research into the competitive performance on supply chain practices of different vehicle manufacturers in South Africa, this article intent to fill the gap by answering the following research questions:

Research question 1: What is the extent to which light vehicle manufacturers implement supply chain practices (with reference to the inbound, outbound and internal supply chain)

Research question 2: Are there any differences in supply chain practices between light vehicle manufacturers of different origins in South Africa (Asia and Europe)

It is important to note that South African housed most of the multinational automotive manufacturers, and the industry is very important to the South African economy in term of employment gross domestic product. The findings therefore contribute to the body of knowledge on how light vehicle manufacturers in South Africa implement supply chain practices. It also provide for and understanding the differences in practice between manufacturers of different origin. The article is structured as follows: relevant literature is reviewed; followed by the research methodology; findings and discussion as well as the conclusion.

2. LITERATURE REVIEW

The literature review focuses on SCM practices as well as vehicle manufacturers in South Africa.

2.1 SCM practices

SCM practices according to Li *et al.* (2006:108) encompass supplier partnerships, customer relationship and information sharing. It is a multidimensional construct that encompasses upstream and downstream sides of supply chain (Li *et al.* 2006:108). Donlon (1996:55) asserted that outsourcing, supplier partnerships, information sharing, cycle time, compression and continuous process flow forms part of SCM practices while Tan *et al.* (2002:3) represented SCM practices in the form of quality, purchasing and customer relationships.

The key aspects of SCM practices according to Tan *et al.* (2002:3) are supply chain integration, information sharing, customer service management, geographic proximity, and JIT capabilities which are essential to create supply chain responsiveness. Li *et al.* (2006:108) identified SCM in form of strategic supplier partnership, customer relationship, and information sharing.

SCM can be defined as "the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole" (Christopher 2005: 5). SCM involves a set of approaches utilised to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimise system-wide costs while satisfying service level requirements (Simchi-Levi, Kaminsky & Simchi-Levi 2007:1). Generally, SCM involves relationships and managing the inflow and outflow of goods, services and information (network) between and within producers, manufacturers and consumers (Gripsrud, Jahre & Persson 2006:645). It can be viewed from three different angles which is evident in different definitions as: SCM as a management philosophy; the implementation of the SCM as a management philosophy; and a set of management processes (Lambert 2006:13). Therefore, SCM involves the management of the activities of the supply chain to foster the emergence of a value system.

SCM includes coordination of and collaboration with processes and activities across different functions such as marketing, sales, production, product design, procurement, logistics, finance and information technology within the network of the organisation (Blos, Quaddus, Wee & Watanabe 2009:247). In the automotive industry, supply chains have revolved mainly around making supplier collaboration and manufacturing operations more efficient. However, the dynamics of the marketplace have changed. In Asian markets, more than 20 new OEMs, joint ventures and thousands of suppliers were positioning to capture a piece of the projected 140 million new vehicle owners in China. In Eastern Europe, lower cost structures and the availability of highly skilled labour enticed OEMs and suppliers to establish new facilities, technology and design centres. With the burst of the Internet bubble, a more rational reality set in (Zhang & Chen 2006:668).

As indicated above, the literature depicts SCM practices from different perspectives with goal of improving competitive advantage of firm. By improving competitive advantage of the firm, organization could improve its performance. In reviewing and consolidating the literature, the following distinctive practices can be identified as determinants of best practices for competitive advantage: forming strategic partnerships; establishing long-term

relationships; cooperating to improve processes and operations; collaborating on new product development; building supply chain trust; sharing relevant information; and sharing supply chain risk. Table 1 summaries the benefits of implementing supply chain practices.

TABLE 1: Summary of the benefits of implementing supply chain practices

Practices	Benefits to the supply chain
Forming strategic partnerships	Improve working relationships, spread risk, increase market power, pre-empt resources, access new markets and gain organisational learning (Tang & Qian 2008:291).
Establishing long-term relationships	Ensure stable relationship with comparatively few suppliers that can deliver high-quality supplies, sustain delivery schedules, and remain flexible relative to changes in specifications and delivery schedules (Naude & Badenhorst-Weiss 2011:75).
Cooperating to improve processes and operations	Ensures full integration between the main industry, increases competitive power and sustainability of the automotive industry, leads to development of competitive products and technologies (Bütüner & Özcan 2011:9).
Collaborating on new product development	Being able to use the expertise of suppliers to make better designed parts that are easier to manufacture, parts are easier to build and this significantly reduces costs and lead times (Braese 2005:59).
Building supply chain trust	Provides good levels of performance, efficiency, and quality, ensures serious commitment from partners which leads to the expected level of performance from suppliers (Matsubara & Pourmohammadi 2009:92).
Sharing relevant information	Plays a key role in maintaining sound relationships between supply chain partners, sharing relevant information among business partners depends on the level of trust in the supply chain relationship (Piderit, Flowerday & Von Solms 2011:Internet).
Sharing supply chain risk	Helps to spread risk, increase market power, pre-empt resources, access new markets and gain organisational learning. Strong institutions for collaboration and information sharing should be encouraged (Alfaro, Bizuneh, Moore, Ueno & Wang 2012:23).

Source: Author's compilation

2.2 Vehicle manufacturers in South Africa

The automotive industry is the largest manufacturing sector in South Africa (Kehbila, Ertel & Brent 2009:310). Manufacturing vehicles requires the employment of about 9 million people directly in producing the vehicles and the automotive components that go into them (Automotive Industry Export Manual [AIEC] 2012:13). According to the AIEC (2012:13)

report, it is estimated that each direct automotive job supports at least another five indirect jobs, resulting in more than 50 million jobs globally owed to the automotive industry. The industry sector's contribution to South Africa's gross domestic product (GDP) was R2 964 billion in 2011 and amounted to 6.8%. Major international assemblers and manufacturers have established operations in South Africa, including OEMs from traditional manufacturing powerhouses in the USA, Japan and Europe, where key decisions about their manufacturing is made.

Most of the global motor vehicle branded manufacturers are represented in South Africa. These include Toyota, BMW, Volkswagen, DaimlerChrysler, Nissan, General Motors, Ford (incorporating Mazda, Land Rover and Volvo) and Fiat. Some of the OEMs manufacture certain models locally for the local market and also export some of their production outputs. These manufacturers are the focus of this study. Fiat, currently does not assemble vehicles in South Africa - hence there are seven automotive manufacturers. These automotive manufacturer operations are concentrated in four South African cities: Pretoria, Durban, East London, and Port Elizabeth (Alfaro *et al.* 2012:15). Toyota is the major producer (in terms of market share) of both cars and light commercial vehicles.

The South African automotive industry produces two broad categories of vehicles. These are passenger vehicles and commercial vehicles. Passenger vehicles are classified from A to D class, premium and SUVs, while commercial vehicles are categorised into light commercial, medium commercial and heavy commercial. Passenger vehicle and light commercial vehicles are termed light vehicles.

3. METHODOLOGY

An exploratory and descriptive research design based on a survey of light vehicle manufacturers in South Africa was employed. A survey is a form of research where the researcher interacts with respondents to obtain facts, opinion and attitudes (McDaniel & Gates 2001:30). The research instrument was a semi-structured face-face-interview questionnaire. The target population was original equipment manufacturers (OEMs) in the South African automotive industry (local manufacturers) (all light vehicle manufacturers in South Africa).

A purposive sampling technique was used to determine the respondents. Purposive sampling technique was used in order to concentrate on those who have expert knowledge about supply chain practices in the automotive industry (senior supply chain managers). 'Therefore, specific participants for interviews were selected according to their strategic

positions in the supply chain. A total of twelve (N=12) in-depth interviews were conducted from six light vehicle manufacturers.

The interview questionnaire contained statements relating to practices of inbound, outbound and internal supply chain. The closed ended statements in the questionnaire were measured using a five point Likert response format with end points (1) "no extent" to (5) "to a very great extent". The data for this study was analysed descriptively using Statistical Package for Social Sciences (SPSS). The open ended responses were used to give more meaning to the respondents view on questions where it was applicable (Gray, Williamson, Karp & Dalphin 2007:44). In order to determine whether there are differences in supply chain practices between manufacturers of different origins, the manufacturers were classified into three categories: Asia, Europe and America. Table 2 classifies the vehicle manufacturers in South Africa according to their parent company.

TABLE 2: Light vehicle manufacturers according to parent companies in South Africa

Light vehicle manufacturers	Location of parent company
Toyota, Nissan	Asia
General Motors	America
Mercedes-Benz, BMW and Volkswagen	Europe

Source: Author's compilation

4. RESULTS AND DISCUSSION

The result of this article is discussed in two fold. Firstly supply chain practices implemented by individual manufacturers across the supply chain (inbound, outbound and internal supply chain) are discussed and thereafter, the differences between manufacturers of different company of origin based on the research questions.

Research question 1: What is the extent to which light vehicle manufacturers implement supply chain practices (with reference to the inbound, outbound and internal supply chain)

Inbound supply chain practices by manufacturers are discussed first, followed by outbound supply chain practices by manufacturers and then internal supply chain best practices. Table 3 indicates inbound supply chain practices with regard to the particular vehicle (model) included in this study. The results are presented in mean values. For analysis purposes, the following abbreviations were used: E1 for European manufacturer 1; E2 for European manufacturer 2; E3 for European manufacturer 3; AM for American manufacturer; A1 for Asian manufacturer 1; and A2 for Asian manufacturer 2.

TABLE 3: Inbound supply chain practices by different manufacturers

Statements	Mean					
	E1	AM	E2	A1	A2	E3
Form strategic partnerships with strategic suppliers	5.00	4.00	5.00	4.00	5.00	4.50
Have long-term relationships with strategic suppliers	5.00	4.00	5.00	4.25	5.00	5.00
Cooperate with strategic suppliers to improve operations	5.00	4.00	5.00	4.25	4.00	5.00
Cooperate with strategic suppliers to improve processes	5.00	4.00	5.00	4.00	4.00	5.00
Have trusting relationships with strategic suppliers	4.50	4.00	4.00	3.25	4.00	4.50
Communicate with strategic suppliers on new product development	5.00	4.00	5.00	4.00	5.00	3.50
Share relevant information with strategic suppliers	5.00	4.00	4.00	4.25	5.00	4.50
Share objectives and goals with strategic suppliers	4.00	3.50	4.00	3.75	4.00	4.50
Share supply chain risks with our strategic suppliers	4.50	3.00	4.00	3.25	3.00	4.50

Source: Interview

Table 3 indicates that overall, European manufacturers 1 and 2 implemented supply chain best practices, from a great to a very great extent, with mean ratings of 4.00 and 5.00. American manufacturer, Asian manufacturer 1 and 2 and European manufacturer 3 implemented inbound supply chain best practices, from a moderate extent to a very great extent with mean ratings from 3.00 to 5.00. The least implemented best practices by manufacturer were the American manufacturer and Asian manufacturer 2 for sharing supply chain risks with strategic suppliers (a mean of 3.00). Table 4 indicates the mean ratings on how the manufacturers implemented outbound supply chain practices.

TABLE 4: Outbound supply chain practices by manufacturers

Statements	Mean					
	E1	AM	E2	A1	A2	E3
Form strategic partnership with customers	4.00	4.50	5.00	3.25	5.00	4.50
Have long-term relationships with strategic customers	4.00	4.50	5.00	4.00	5.00	4.50

Statements	Mean					
	E1	AM	E2	A1	A2	E3
Cooperate with strategic customers to improve operations	3.50	3.50	4.00	3.25	3.00	5.00
Cooperate with strategic customers to improve processes	3.50	4.00	4.00	3.50	3.00	5.00
Have trusting relationships with strategic customers	4.00	4.00	5.00	3.25	4.00	4.50
Communicate with strategic customers on new product development	4.50	4.50	4.00	4.50	2.00	3.50
Share relevant information with strategic customers	4.00	5.00	5.00	3.75	4.00	4.50
Share objectives and goals with strategic customers	4.50	4.00	4.00	3.50	3.00	4.50
Share supply chain risks with strategic customers	3.50	2.00	4.00	2.75	3.00	4.50

Source: Interview

From the results, it can be deduced that overall, only European manufacturer 2 implemented outbound supply chain best practices, from a great to a very great extent (a mean of 4.00 to 5.00) with its strategic customers. The distribution of the findings for the other manufacturers supply chain best practices on the customer side of the supply chain overall, varied from a mean of 2.00 to 5.00. Maximum mean ratings of 5.00 were recorded for sharing relevant information (American manufacturer and European manufacturer 2), having trusting relationships (European manufacturer 2), establishing long-term relationships (European manufacturer 2 and Asian manufacturer 2) and cooperation to improve processes and operations (European manufacturer 3) with its strategic customers. The lowest mean rating (2.00) was recorded for the American manufacturer for sharing supply chain risks and Asian manufacturer 2 for communicating with strategic customers on new product development. Table 5 provides the mean ratings on how the manufacturers implemented internal supply chain practices.

European manufacturer 1 and 2 and the American manufacturer implemented internal supply chain best practices, on average, from a great to a very great extent (a mean of 4.00 to 5.00). Asian manufacturers 1 and 2 implemented internal supply chain best practices, overall, from a moderate to a very great extent (means of 3.00 to 5.00), while European manufacturer 3 implemented internal supply chain best practices, from a slight extent (a

mean of 2.50) to a very great extent (a mean of 5.00). The least implemented practice was recorded for European manufacturer 3, with a mean of 2.5 for sharing supply chain risks with other departments. Generally speaking, the manufacturers implemented the best supply chain practices in their internal supply chain. Communication, cooperation and sharing risks received more attention at some of the manufacturers.

TABLE 5: Internal supply chain practices by manufacturers

Statements	Mean					
	E1	AM	E2	A1	A2	E3
Cooperate with other departments to improve operations	5.00	4.50	5.00	4.50	3.00	3.50
Cooperate with other departments to improve processes	5.00	4.00	5.00	4.50	3.00	4.00
Communicate with other departments on new product development	5.00	4.50	4.00	4.00	5.00	3.00
Share relevant information with other departments	5.00	4.50	5.00	4.50	4.00	5.00
Ensure alignment between objectives and goals with those of other departments	4.50	4.50	5.00	4.00	4.00	4.00
Share supply chain risks with other departments	4.50	4.00	5.00	3.75	3.00	2.50

Source: Interview

Table 6 presents a summary of the open questions in 7 major categories.

TABLE 6: Description of categories

Category	Description of category
Partnerships	Have good working relationships; share goals; have system suppliers; established partnerships agreement.
Relationship	Co-design with strategic suppliers; have equity ties with suppliers
Cooperation	Share ideas; good communication network with suppliers and other partners.
Collaboration	Use supplier expertise for new product development; Host teams of suppliers who are engineers.
Trust	Have mutual comments with strategic partners; have efficient and trusted relationships.
Information	Integrate with strategic partners; Share relevant information with key partners; utilised web-based systems to collaborate with partners.

Risk	Promote strong collaborative institutions; collaborate on insurance.

As indicated in Table 6, local vehicle manufacturers in South Africa implement SCM practices to a great extent.

Research question 2: Are there any differences in supply chain practices between light vehicle manufacturers of different origins in South Africa (Asia and Europe)

This research question shed light on the possible different management cultures or styles typical in Asian versus European cultures. To answer this research question, hypothesis was developed and the Mann-Whitney U test was used to establish whether there is a perceived difference. The Mann-Whitney U test is a nonparametric counterpart of the t-test for independent groups without the t-test's limiting assumptions (Welman, Kruger & Mitchell 2007:230; Blumberg, Cooper & Schindler, 2006:580). The test was used because of the small sample size and the data type (ordinal). The Mann-Whitney U test was conducted to see whether there was a significant difference between the parent company's continent origin (Asia and Europe) with regard to their supply chain practices. In South Africa, the big three automotive nations are represented, emanating from Asia, Europe and America. The test did not include the American manufacturers because only one was represented in the study.

The hypotheses tested for the supply chain practices are:

- H0: Local manufacturers of light vehicles of Asian and European parent company origin do not differ statistically significantly with regard to implementing supply chain practices.
- H1: Local manufacturers of Asian and European parent company origin do differ statistically significantly with regard to implementing supply chain practices.

With regard to the implementation of supply chain best practices, no statistically significant differences were found between local manufacturers of European and Asian parent company origin with the exception of a few best practices. Table 7 reflects the statements in which there was a statistically significant difference, at the 5% level of significance, between OEM continent origin (Asia and Europe) with regard to implementing supply chain best practices.

With regard to inbound supply chain best practices, the local manufacturers of European origin (mean rank of 7.00) implemented long-term relationships with their strategic suppliers to a greater extent compared to manufacturers of Asian origin (mean rank of 4.00) with a p-value of .050. European manufacturers (mean rank of 7.50) also cooperated with their

strategic suppliers to improve processes to a greater extent than Asian manufacturers (mean rank of 3.50) with a p-value of .017. Also, European manufacturers (mean rank of 7.40) implemented a trusting relationship with their strategic suppliers to a greater extent than Asian manufacturers (mean rank of 3.60) with a p-value of .031. These results indicate that light vehicle manufacturers of European origin implement inbound supply chain practices to a greater extent compared with Asian manufacturers.

TABLE 7: Mann-Whitney test: significant differences in supply chain practices

Supply chain practices	Mean rank	p-value
Inbound supply chain practices		
Have long-term relationships with strategic suppliers	Asia = 4.00 Europe = 7.00	.050
Cooperate with strategic suppliers to improve processes	Asia = 3.50 Europe = 7.50	.017
Have trusting relationship with strategic suppliers	Asia = 3.60 Europe = 7.40	.031
Outbound supply chain practices		
Share supply chain risks with strategic customers	Asia = 3.70 Europe = 7.30	.049
Internal supply chain practices		
Share relevant information with other departments	Asia = 4.00 Europe = 7.00	.050

Source: Interview

With reference to the outbound supply chain, European manufacturers (mean rank of 7.3) share supply chain risks with their strategic suppliers to a greater extent than Asian manufacturers (mean rank of 3.70) with a p-value of .049. Also, with regard to internal supply chain, European manufacturers (mean rank of 7.00) share relevant information with other departments to a greater extent compared to their Asian counterparts (mean rank of 4.00) with a p-value of .050. Asian manufacturing companies are well known for cooperation and collaboration with their supply chain partners, particularly with their suppliers. This part of the study shows that in certain aspects of supply chain best practices, European companies

show significantly better supply chain best practices than their Asian counterparts. These differences could be attributed to cultural diversity and strategies of the organisations.

5. CONCLUSION

This article explores supply chain practices of vehicle manufacturers in South Africa and determines whether there are significant differences between manufacturers of different parent companies of origin. The research methodology employed was an exploratory and descriptive research design based on a survey of light vehicle manufacturers in South Africa was employed. The research instrument was a semi-structured face-face-interview questionnaire. A purposive sampling technique was used to determine the respondents, closed statement were analysed descriptively using Statistical Package for Social Sciences (SPSS) while the open questions by content analysis to give more meaning to the closed questions. The article is of strategic importance as it void the gap in literature with an empirical study on the status of supply chain practices in South Africa. This is because the industry is a leading practitioner of SCM in the country and due to the fact that new practices in SCM have been implemented usually at a greater speed in response to globalisation, technology etc in the business environment.

The findings of the empirical study revealed that across the supply chain, supply chain best practices were implemented to at least a great extent, except for sharing supply chain risk (implemented to a moderate extent). The most highly implemented practices were “building long-term relationships”, “cooperation to improve process” and “collaboration on new product development”. “Sharing supply chain risk” was the least implemented across the inbound, outbound and internal supply chain. European manufacturer 2 implemented supply chain practices to a greater extent compared with the other manufacturers across suppliers, customers and internal departments. Asian manufacturer 1 indicated the lowest level of implementation of supply chain practices across the supply chain. The least implemented practice by all the manufacturers was sharing supply chain risk with strategic partners. Across the supply chain, all the manufacturers performed better with their strategic suppliers compared to their strategic customers.

From manufacturers of different origin, overall, the European manufacturers (parent company of origin) in the South African automotive industry implemented supply chain practices to a greater extent than the Asian manufacturers. For inbound supply chain best practices: local European origin manufacturers differ statistically significantly from the Asian origin manufacturers in implementing long-term relationships with their strategic suppliers.

The local European origin manufacturers also differ statistically significantly from the Asian manufacturers on cooperation with their strategic suppliers to improve processes. Lastly, the European manufacturers differ statistically significantly from the Asian manufacturers on having a trusting relationship with their strategic suppliers. For outbound supply chain best practices: local manufacturers of European origin differ statistically significantly from Asian manufacturers with regard to sharing supply chain risks with their strategic suppliers. For internal supply chain best practices: Manufacturers of European origin differ statistically significantly from the Asian manufacturers with regard to sharing relevant information with other departments.

A limitation of the study is that one of the light vehicle manufacturer was unwilling to participate in the study. It is not known if the findings could have been different with the involvement of that company. Further research is recommended on the following: replication of the study in another country; investigating risk sharing in supply chains and investigating cooperative relationships with regard to the outbound supply chain.

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