Managing Product Returns to Achieve Supply Chain Sustainability: An Exploratory Study and Research Propositions

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Abstract

The aim of this article is to develop research propositions for product returns management using the Institutional Theory (INT) as the foundation for the study. The paper culminates with a research model based on this theoretical perspective to examine the input and output of product returns management as part of a comprehensive sustainability effort. The study is exploratory in nature based on five case studies of participating manufacturers in the automotive, and electrical and electronics industry in Malaysia. The interview results reveal that the five participating companies established a product returns management program to handle three types of product returns found in their organizations. This is not surprising because successful product returns management has a number of internal and external benefits to the firms. Our interviews also uncover that the abundant amount of product returns is pressing these companies to implement an effective product returns management program. Based on the primary and secondary data collected in this study, three propositions are developed for future research, which should be tested with a large empirical data set to strengthen the theoretical contributions and managerial implications of this study.

Keywords: Product Returns; Manufacturing Returns; Distribution Returns; Customer Returns; Product Recovery
1.0 INTRODUCTION

Product returns management plays a significant role in the sustainability of a firm’s operations. Although the management of product returns has been traditionally focused on cost reduction (Rogers & Tibben-Lembke, 2001), the shrinking global supply of materials and environmental degradation have caused firms to rethink the need to salvage their product returns. Along with the implementation of environmental policies and regulations, many firms have begun to change their focus on reverse supply chains by launching recovery programs, such as repair, reuse, remanufacturing, remarking and refurbishing (Gobbi, 2011). In addition to providing attractive business opportunities, the recovery process could induce sustainable process development and gain competitive advantage in the market (Jack, Powers, & Skinner, 2010). Hence, managing product returns in an effective and efficient way is gaining attention from the industry as well as among academics (Srivastava & Srivastava, 2006).

In relation to this, many concepts and practices for product returns in the reverse supply chains have been extensively discussed in the literature. Among the major concepts brought forward are industrial ecosystem, product life-cycle stages management, closed-loop supply chains, integrated supply chain management, and green or sustainable supply chains (Seuring, 2004). The main idea behind the concepts is to resolve environmental challenges across the supply chain through the extension of the product lifecycle, in which product returns are expected to create the utmost value during the reverse flow in a closed-loop supply chain (Mondragon, Lalwani, & Mondragon, 2011). For example, Jayaraman and Luo (2007) described how product returns provide an opportunity for manufacturers to remarket the reusable products due to the large volume of returns that could exceed six percent of total sales. In addition, Stock and Mulki (2009) found that effective product returns management could yield higher profitability due to lower operating cost and higher salvage or retrieval value of returns. Furthermore, the economic, regulatory, and customer pressures motivate business executives around the globe to implement an effective product returns management program (Srivastava & Srivastava, 2006).

In practice, the vast majority of developed countries require manufacturers and importers to comply with legislation that has been introduced based on extended producer responsibility (EPR). For example, certain businesses must collect and repossess their defective or end-of-life (EoL) products. Moving in a similar direction, the Malaysian government established mandates to require its private sector, especially manufacturers to improve waste management by adhering to government programs initiated by the enactment of the Reduce, Reuse and Recycle (3R) practices (EPU, 2010). This paves the way for the Malaysian government to launch its EPR execution plan in the near future. Although the plan is still in the pipeline, its current focus is the implementation of incentives based on a deposit refund scheme and take back system. This EPR execution plan motivates consumers to return used, recyclable products in exchange for monetary incentives from the manufacturers who are obligated to take back EoL products (EPU, 2010).

Malaysia is a developing country that strives for higher development and economic achievement. A key driving force for the country to achieve its vision as a developed nation by 2020 is its distinctive competency in the industrial sector in Southeast Asia. Nevertheless, its rapidly flourishing industrial sector has adversely polluted its environment due to the escalating volume and diversity of toxic and hazardous wastes, pollution and rapid depletion of its natural resources (Abdullah, 1995; Lau, 2004; Agamuthu & Victor, 2011). The amount of scheduled waste generated by Malaysian businesses and the manufacturing industry has increased from 1.1 million in 2006 to 1.8 million metric tons in 2011 (JAS, 2011). The rapidly deteriorating
environmental condition could gravely jeopardize Malaysia’s ambition of becoming a
developed nation because a polluted environment threatens the balance of economics and
social growth, and sustainable development, which will particularly affect the economic and
social aspects after the country attains developed status in 2020.

On a different perspective, Mohamed (2009) showed that from 2000 to 2005, at least 45
percent of industrial waste has been salvaged. The trend showed an increase in recovery rates
from 35 percent in 2000 to 58 percent in 2004. The value of industrial waste recovered during
this period was estimated at RM9.46 billion, or a volume of 3.4 million metric tons (Mohamed,
2009). Waste recovery is not only confined to cost saving in procuring new materials, but also
helps to reduce energy usage during production and waste recovery (Zhang & Wang, 2014).
Industrial waste recovery was carried out predominantly by the 119 industrial waste recycling
firms permitted by the Ministry of Housing and Local Government across Malaysia
(Mohamed, 2009). Hence, this indicates that there are ample opportunities to transform
industrial waste into economic benefits. The large amount of recoverable materials should
motivate manufacturers to become directly and proactively involved in various product
recovery activities, including remanufacturing, re-use and recycling, instead of relying on a
third party firm to handle their product returns.

Despite the importance of product returns, recent studies showed that most firms in Malaysia
have taken a reactive approach to manage product returns (for example, Eltayeb and Zailani,
2009; Eltayeb, Zailani and Ramayah, 2011; Olugu, Yew and Shaharoun, 2010; Nik Ab Halim,
Sabariah and Haim Hilman, 2011). This is mainly due to the lack of return capabilities (Eltayeb
et al., 2011), high cost of returns operations (Eltayeb et al., 2011; Khor & Mohamed Udin,
2012) as well as the obstacles in obtaining the sufficient volume and proper timing of the
returns (Shaharudin, Zailani, & Tan, 2014). Since product returns management is not a part of
their core competencies, many firms are ill-equipped to handle product returns. Although
improper by modern standards, the traditional approach of firms in Malaysia is to refuse
product returns due to the lack of a process to handle returns (Jayaraman & Luo, 2007). As a
result, recovery tasks in Malaysia are handled by scrap contractors or junk dealers who lack
any practical blueprint for sustainable operations (Mohamed, 2009), and whose operations are
non-sustainable due to their inobservance of most environmental considerations (Mohamed,
Taha, Idrus, Hadi, & Harman Shah, 2008). Their primary interest is to recover materials that
have monetary value in the scrap market. As a result, only a limited portion of materials, such
as plastic, steel, paper, glass and packaging, are recovered from returns (Mohamed, 2009). This
has created another challenge in Malaysia – finding ways to recycle discarded materials from
scrap contractors and junk dealers.

However, many environmentally responsible firms in Malaysia are proactively taking back
their EoL products, though primarily for marketing purposes. Some firms have established
incentive programs to encourage customers to trade-in their EoL products as partial payment
for new products. In Malaysia, the level of extended producer responsibility adoption is still
low because most companies accept returns through their own initiative (Agamuthu & Victor,
2011). Currently, companies that accept returns are limited to a handful of multinational firms,
such as Motorola Malaysia, Nokia Malaysia, Dell Malaysia, Apple Malaysia and HP Malaysia.
These firms have voluntarily implemented a product returns program as part of their corporate
responsibility to protect the fragile global environment (Agamuthu & Victor, 2011).

Although understanding the input, process and output of returns management is the first step
toward the adoption of environmental sustainability initiatives, there are limited studies
concerning such matters, especially in developing countries. In addition, while the limited
number of empirical studies (survey and exploratory) examining product returns compared to the vast mathematical modeling studies has hindered the progress of the overall effort toward theory verification and development in this area, new discovery in this area is imperative to ensure that manufacturers in Malaysia meet the sustainability vision instituted in the Tenth Malaysia Plan (2011-2015). This short-term plan, based on the concept of sustainable production activities, was designed to assist the government to achieve a balance between economic growth and environmental protection.

In summary, this paper explores the extent, drivers (input) and impacts (output) of product returns management among manufacturers in Malaysia. This study hopes to fill the research gap in that there is a lack of theory development research in product returns management (Carter & Ellram, 1998; Daugherty, Autry, & Ellinger, 2001; Jahre, 1995), including empirical research in the reverse flow operations (de Brito & Dekker, 2003). This research aims to contribute to the literature by offering research propositions to examine product returns management, particularly in the context of Malaysia where firms are mostly irresponsible to sustainability (Albino, Balice & Dangelico, 2009).

The next section briefly reviews the background literature, followed by a discussion on theoretical development. The fourth section provides the research methodology, followed by a discussion on the results of the data analyses in the fifth section before presenting the development of the propositions in the sixth section. Finally, the paper provides a delineation of the discussions of the findings and the conclusion of the study.

2.0 LITERATURE REVIEW

Extended Producer Responsibility (EPR)

Extended producer responsibility is the most significant basis for developing policies for waste reduction and the prevention of discarded products adversely affecting the environment at the end of their useful life (Forslind, 2005). This is apparent from the basic idea behind EPR implementation to hold producers liable for any environmental pollution caused by their products, particularly when the products reach the end of their lifecycle. The purpose is to motivate manufacturers to proactively enhance their products and processes toward designing for the environment (OECD, 2006). The widely held belief in the literature that EPR in any form could stimulate firms toward the eco-design of their products (Brouillat & Oltra, 2012; Mohamad Zailani, Eltayeb, Hsu, & Tan, 2012) has strengthened the argument concerning the effectiveness of the policy in forcing firms to adopt environmental activities.

In relation to this, Forslind (2005) argued that EPR is an expansion policy from the “polluter pays principle” in which regulatory authorities hold the polluter responsible for the cost of implementing the measures necessary to protect the environment. Although there are several ways to apply EPR, the core principle is the take-back obligation imposed on the producers (Fleckinger & Glachant, 2010). EPR addresses the deficiencies of the “end-of-pipe” approach, which focuses on pollution that has already happened (Xiang & Ming, 2011). Extended producer responsibility creates two major obligations: consumers are responsible for returning EoL products, whereas manufacturers are responsible for managing product returns from consumers (Forslind, 2005).

Extended producer responsibility has already been enforced in certain developed countries, such as Germany, Sweden, Switzerland and Canada, and, subsequently, has been followed by
developing countries like Brazil, South Africa and India (Xiang & Ming, 2011). In South Korea, the government has emulated a blueprint similar to the EU’s environmental policy to regulate raw materials in the electronics industry and to enforce producers’ recycling responsibilities (Spiegel, 2008). Japan and Taiwan have begun to impose “take-back” laws that require manufacturers to reclaim their EoL products (Nnorom & Osibanjo, 2008). Following the rapid industrialization era, numerous comprehensive policies and regulations were drafted and enforced from 1995 to 2010 to mitigate the level of environmental pollution in Malaysia. Although some policies have the basic elements of EPR, these policies remain a legal concept that lacks structure for enforcement (Agamuthu & Victor, 2011). This clearly signifies that waste management and conservation in Malaysia are still in the infancy stage with minimum requirements for the acquisition of end-of-use products, recovery and waste discarding for solid and scheduled wastes (Agamuthu & Victor, 2011).

**Sustainability in Supply Chain Management**

Many studies have deliberated the scope of sustainability in supply chain management (SSCM) in the operational context. In this context, Zsidis and Siferd (2001, p.69) defined SSCM as “the set of supply chain management policies held, actions taken, and relationships formed in response to concerns related to the natural environment with regard to the design, acquisition, production, distribution, use, reuse, and disposal of the firm’s goods and services”. This clearly indicates that the difference between the traditional cradle-to-grave supply chain and the contemporary cradle-to-cradle supply chain is the firm’s capability to generate eco-efficiency to achieve supply chain sustainability.

Supply chain sustainability can be achieved if a good green supply chain management (GSCM) program is in place (Markley & Davis, 2007; Rao & Holt, 2005; Zailani, Jeyaraman, Vengadasan, & Premkumar, 2012) because all business entities are members of at least one supply chain. The actions of marketing, purchasing, or production affect the entire supply chain and have implications for the natural environment (Sarkis, 2001). In order to create a green supply chain, business entities must incorporate environmental measures to scrutinize the sources of materials and waste reduction effort (Beamon, 1999). GSCM is capable of minimizing the ecological impact of manufacturing activities without sacrificing quality, cost, reliability, performance and energy efficiency, and leads to sustainable processes that forego end-of-pipe control, reduces ecological damage and boosts profitable operations (Srivastava, 2007). Nonetheless, it is worth noting that the SSCM concept is an extension of GSCM in which in the former initiative, energy and materials are reused to avoid waste via landfills and incineration. However, GSCM merely protects the environment with little effort to replenish energy in the supply chain (Solvang, Deng & Solvang, 2007). In terms of triple-bottom-line performance, GSCM focuses on profit (economy) and the planet (environmental) but ignores people (social) (Halldórsson, Kotzab, & Skjøtt-Larsen, 2009).

Zhu, Sarkis and Geng (2005) proposed that SSCM is prevalent in key environmental practices, which include eco-packaging, end-of-life and used products in a closed-loop system, product returns and recovery management, and waste disposal in an environmentally responsible manner. On a similar note, Ramudhin, Chaabane and Paquet (2009) signified that SSCM is associated with green design, inventory control, scheduling and control for remanufacturing, product salvage, reverse supply chains, managing waste and emissions mitigation. Hence, the literature suggests that SSCM focuses on the product lifecycle from the early stage of product development (eco-design) to post-sales services with a specific focus on the critical role of product returns management in the closed-loop system.
A recent study by Hassini, Surti and Searcy (2012), in which the authors proposed a conceptual framework comprising six inter-connected functions of SSCM, has prompted new ways to view SSCM. As shown in Figure 1, the six functions of SSCM involve the initial stage of material sourcing, transformation to final products, delivery of finished products to customers by a selected mode of transportation, value proposition by selling sustainable products, green product performance during consumption, and, lastly, the recovery of used products through reuse, recycle and return (3R). In this stage, the recovered materials or components are used as raw materials to manufacture new or refurbished products (Hassini et al., 2012). The utilization of the recovered resources is a part of the characteristics of the main operations, although, to a certain extent, the recovered resources may not be well received by new customers. The arrows describe the clockwise flow of the six functions in a sequence that encompasses the lifecycle of the product from the sourcing of raw materials to consumption, and, finally, recycling. In this way, the volume of disposal or waste is minimized and the overall SSCM objective to safeguard the environment can be achieved with great success.

![Figure 1: Key Functions in SSCM](Source: Hassini et al. (2012))

**Product Returns Management**

Notwithstanding that the management of product returns to meet sustainability objectives is attracting attention from all the parties involved in the supply chain, especially manufacturers who are required to handle the return flow process (Srivastava, 2007; Toffel, 2004), some companies do not see that good reverse supply chain practices could have a positive impact on their market share and competitiveness (Jayaraman & Luo, 2007). As a result, they failed to establish an appropriate reverse flow process to handle product returns, and missed the opportunity to reclaim a substantial amount of recoverable products. Instead, a small amount of recovered products are extracted by these manufacturers (Guide Jr., Souza, Wassenhove & Blackburn, 2006).
Although product returns originate from various sources, our literature review shows that there are several classification schemes to categorize the type of product returns. In general, product returns can be classified into three phases in the product lifecycle: manufacturing, distribution and customer returns (De Brito & Dekker, 2004; Stindt & Sahamie, 2012; Talbot, Lefebvre, & Lefebvre, 2007). Figure 2 shows the three types of product returns: manufacturing returns, distribution returns and customer returns. Manufacturing returns originate from internal sources whereas distribution and customer returns come from external return sources. However, returns from external sources are beyond the control of the original producer, thereby complicating the return process along the reverse supply chain (Stindt & Sahamie, 2012). Each type of returns is described below:

a) Manufacturing returns – returns for rework, scrap, misspecifications, by-products and partial containers
b) Distribution returns – returns because of damage, end-of-shelf life and contamination
c) Customer returns – returns of end-of-use, end-of-life, repair, damage and warranties

![Figure 2. Classification of Product Returns](source: Stindt and Sahamie (2012))

In addition, the literature shows that the recent high acceptance of product returns management by companies is due to the following reasons:

a) The volume of returns in some industries exceeds 50 percent of total sales (Trebilcock, 2002), which has prompted manufacturers to find ways to deal with returns effectively.
b) Product returns have significantly increased cost, therefore pressuring manufacturers to explore means for reuse, remanufacture and disposal (Blackburn, Guide Jr., Souz, & Van Wassenhove, 2004).
c) The extra revenue from the sales of unused products in the secondary and global markets (Meyer, 1999).
d) The establishment of regulations and policies pertaining to take-back laws, especially in Europe and the United States, has prompted firms to be environmentally responsible for their products (Fishbein, 1994; Toffel, 2003).
e) The pressure from customers (Dües, Tan & Lim, 2012) to find ways to dispose of products containing hazardous waste.
f) The limited landfill capacity has motivated firms to explore recovery alternatives, such as repackaging, recycling, reuse and remanufacturing (Thierry, Salomon, Van Nunen, & Van Wassenhove, 1995; Thorn & Rogerson, 2002).

The above reasons strongly support that successful product returns management provides value to the organization through the recovery activities, which, eventually, could increase the firm’s performance and competitive advantage.

**Product Returns Management in Malaysia**

As discussed in the previous section, product returns can be classified into manufacturing, distribution and customer returns. Figure 3 illustrates the overall flow of the manufacturing returns process in Malaysia.

![Flow of manufacturing returns in Malaysia](image)

As depicted in Figure 3, manufacturing returns from industry are destined for four possible locations. Product returns to the treatment facility and onsite treatment normally only covers the limited task of repairing the returns. This is undertaken by some manufacturers either through the internal facility, or even at an external branch that is closer to the customers in order to give the best service. Furthermore, there are returns that are exported overseas to fulfill the demand of the international market. They are even exported as a routine requirement to the subsidiaries located overseas to carry out further processing and recovery. In the recovery, manufacturing returns are sold to a third party, who later undertakes the recovery of the returns in their own junk yard (Mohamed, 2009). Although very little is known about the whole process in the junk yard, in general, the activities are confined to mere disassembling or dismantling tasks rather than involving a complete manufacturing process. In the subsequent stage, the materials recovered are returned to the industry for reuse in their manufacturing process.

Nevertheless, concerning the distribution and customer returns, the statistics from published materials, particularly in Malaysia, are scarce since this area is still new in research and most of the data are kept for internal use only. Other researchers, such as Guide Jr. and Van Wassenhove (2001), and Krikke, Hofenk and Wang (2013), have encountered a similar
problem, as they clearly indicated in their studies that up-to-date data on manufacturing returns and practices are still absent. This provides further challenges in validating the hypotheses and efforts that are needed to collect the information directly from the industry.

3.0 THEORETICAL FOUNDATION

This study is grounded on the theoretical foundation of the strategic concept of institutional theory (INT). In this case, the INT provides an appropriate platform for understanding the external pressure placed on manufacturers to adopt certain activities internally (Hirsch, 1975; Lai, Wong, & Cheng, 2006) that could cause them to carry out particular strategic actions (Hoffman, 1997; Scott, 2001; Scott, 2008). This influence can be transferred to firms through the three forms of coercive, normative and cultural-cognitive isomorphism (DiMaggio & Powell, 1983; Scott, 2001). In addition, product returns management can be linked to the firm’s environmental efforts, in that research has signified that two main factors – legislation and market forces – are behind the reasons why firms manage returns on a voluntary basis (Arora & Cason, 1995a; Khanna & Damon, 1999). This point is significant since the existence of businesses is not only to venture into profitable projects but also to seek legality to achieve core competitiveness and long-term survival (Suchman, 1995) in the market. Besides the environmental regulations, the increasing global competition, short product lifecycle and a friendly consumer product returns policy could possibly induce a higher volume of product returns (Guide Jr., Harrison, & Van Wassenhove, 2003) that pressures manufacturers to adopt product returns management in their reverse supply chain. Hence, the INT role in providing guidelines in reverse logistics research is pertinent concerning its explicit and implicit effects for sustainable business performance in emerging markets (Richey, Tokman, Wright, & Harvey, 2005).

4.0 METHODOLOGY

Research Design

The main objective of this paper is to explore the extent of product returns management among manufacturers in Malaysia. This study employed an exploratory technique to develop the research framework, and used an explanatory research method to establish the research propositions. In developing the research framework, this study used primary case study data through interviews with companies that have adopted product returns management in Malaysia. The corroboratory approach (Yin, 2003) suggests that results from these multiple case studies can be very precise and reliable. From the data obtained, analysis was conducted using the key variables of the study. Through the support of literature in the explanatory part, a research framework was developed to establish the research propositions. The study design is summarized in Figure 4.
Interview and Analysis Procedure

The exploratory case study methodology has been used to explore and explain new phenomena (Yin, 2003) to develop new theories in operations management (Voss, Tsikriktsis, & Frohlich, 2002), especially for relatively under-explored research topics (Lee & Lam, 2012). According to Larsson and Lubatkin (2001), case study methodology provides a better interpretation of the study topic than survey or empirical research albeit it could be problematic to generalize the findings. Through case studies, the evidence for hypothesis development can be made available, especially in the exploration of limited knowledge of the research area (Cavaye, 1996). In fact, case studies have been identified as one of the frequently used methods in reverse supply chain research to explore a wide range of research questions (Lau & Wang, 2009).

This study relied on case study because of its facilitation and flexible nature in corresponding to the complexities of the industries (Dubois & Araujo, 2007) concerning the adoption of product returns management. Although the case studies involved a small number of firms, generalization of the study results is only possible by choosing the major and representative subjects of the study (Lau & Wang, 2009). The analysis of data collected is built around the data triangulation and pattern harmonization approach (Yin, 2003), which has the potential to reinforce the internal validity of the data (Manomaivibool, 2009). In relation to this, data triangulation is a process in which the validation of a phenomenon is made by multiple data sources (Jick, 1979). This is accomplished through the cross-checking of the findings derived from primary and secondary data, for a more complete understanding of the emerging phenomena in the study. In fact, triangulation can reduce the common method bias (Jick, 1979) particularly for the data collected from the same respondent who provides information for all the study variables (Denzin & Lincoln, 2005; Podsakoff et al., 2003).

In a broader sense, this can enhance the credibility of the data for further analysis and generalization of the study results. Coherent with the necessity for the exploratory nature of
study by Robson (2002), this study has determined the input, process and output/impact, as depicted in Figure 5.

![Figure 5. Theoretical framework for the adoption of product returns management](image)

As shown in Figure 5, the theoretical framework of the study comprises the input, process and output of the adoption of product returns management. The input is represented by the type and volume of returns, the process is the adoption of product returns management and the outcome (output) is the effectiveness of the product returns management. The external forces from institutional structures determine the type and volume of the returns (input), which subsequently lead to the adoption of product returns management. In this respect, the institutional theory provides the fundamental understanding concerning how the external forces influence the adoption of product returns management. With the increased pressures from government regulations and competition, the product returns issue has become inevitable for companies, as there is a need for the adoption of the product returns process to deal with the increasing type and volume of returns in the reverse flow chains. In addition, the three forms of coercive, mimetic and normative isomorphism drivers, as suggested by DiMaggio and Powell (1983), contribute to the overall effort of companies to implement the product returns management so that the pressures from each of the drivers can be dealt with in an appropriate way. In the subsequent stage, the adoption will eventually produce the outcome or impact that has been identified in the study as the effectiveness of product returns management. The effectiveness of product returns management refers to the accomplishment that the companies would like to achieve from the adoption of product returns management. Hence, through the case study method, this particular framework is expected to provide the extent of product returns management among Malaysian manufacturers including its drivers (input) and impact (output). Such a framework is imperative in view of the lack of models used by manufacturers to enhance their environmental performance, compared to the abundance of concepts and tools in the literature concerning the assessment of production performance systems (Despeissee, Ball, Evans, & Levers, 2012).

In terms of the sampling frame, the selective sampling method was used to screen companies that have adopted product returns management in the states of Kedah and Penang in Malaysia. Next, the purposive sampling technique was used to select companies that exhibit the characteristics and expertise appropriate for this study (Sekaran, 2003). This study chose five companies out of the fourteen that were invited to participate in the interviews, with varying sizes, focus and missions. Three of the participating firms are multinational (MNC) companies, whereas the remaining two are local manufacturers with certified international quality management and environmental compliance management standards. MNCs and companies with certified ISO 14001 were selected due to their high level of green supply chain
Participation (Eltayeb et al., 2011; Eltayeb & Zailani, 2009). Some automotive companies were selected due to their low innovation in green-related issues (Conding, Habidin, Mohd Zubir, Hashim, & Seri Lanang Jaya, 2012). Nevertheless, to completely disqualify the automotive sector in this study is inappropriate, as many of them have already established reverse operations to serve their customers. The remaining nine companies were disqualified due to their limited scale and involvement in product returns management. In addition, several other companies refused to participate for confidentiality reasons. However, the sample is considered appropriate for this exploratory research to derive a set of research propositions (Eisenhardt, 1989). Data were collected through semi-structured interviews to ascertain the extent of product returns management among the participating firms in the automotive and electrical and electronics industry. Similar questions were posed to all the respondents who were free to answer the open-ended questions without any restrictions on the boundary of the posed questions.

Once the sampling frame was identified, one of the authors called the companies to explain the objectives of the interview and solicit qualified firms to participate in the study. In terms of the adoption of product returns management, the five selected firms were fully aware of the interview objectives and the process involved. During the interviews, the researcher used a list of pre-set questions in a semi-structured manner, and where appropriate, additional questions were raised during the interview depending on the interviewee’s feedback and comments. In order to obtain as much relevant information as possible, interview questions were designed to give the respondents the flexibility to express their views. This is imperative in view of the lack of understanding of the extent of product returns among manufacturing firms in Malaysia.

The interviews were conducted with a mid-level or senior production or supply chain manager in each of the companies. Since the scope of this study is within their job responsibilities, it is expected that the information gathered meets the objectives and purpose of the study. During the initial stage of each interview, a brief description of the study was given and the general idea pertaining to product returns was explained to the interviewees. Each interview took about an hour. The interviews were tape-recorded and transcribed. The data were then analyzed and compared through cross-case techniques (Caniato, Caridi, Crippa, & Moretto, 2012). The results of the cross-case analysis were used to derive and generalize the findings of the study.

Correspondingly, the study analyzed the quantitative data using the open coding approach. In this method, the concepts were labelled and defined using proper categories based on the dimensions and properties of the data. The steps in open coding involved reading through the data or text several times to observe diligently, make comparison and identify the similarities or common characteristics of each firm. Based on the identified categories, the text was then marked and the appropriate labels or codes were set as identification for further analysis. In addition, the common properties with similar context were also grouped under the same categories.

Participating companies were labeled as Company A, B, C, D and E. However, the sample was not equally balanced in terms of the industry sector because four companies were from the electrical and electronics industry (Companies A, C, D & E) whereas only one company was from the automotive industry (Company B).
5.0 FINDINGS

Key Profile of the Companies

Key profiles of the five participating firms are shown in Table 1.

<table>
<thead>
<tr>
<th>Item</th>
<th>Company A</th>
<th>Company B</th>
<th>Company C</th>
<th>Company D</th>
<th>Company E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Employees</td>
<td>3,000</td>
<td>1,500</td>
<td>1,500</td>
<td>9,000</td>
<td>120</td>
</tr>
<tr>
<td>Business Background</td>
<td>Electrical and Electronics</td>
<td>Automotive</td>
<td>Electrical &amp; Electronics</td>
<td>Electrical &amp; Electronics</td>
<td>Electrical &amp; Electronics</td>
</tr>
<tr>
<td>Nature of Business</td>
<td>Business to Business (B2B) and Business to Customer (B2C)</td>
<td>Business to Business (B2B)</td>
<td>Business to Business (B2B)</td>
<td>Business to Business (B2B) and Business to Customer (B2C)</td>
<td>Business to Business (B2B)</td>
</tr>
<tr>
<td>Final Product</td>
<td>Finished Products</td>
<td>Semi-Finished Products</td>
<td>Finished Products</td>
<td>Semi-Finished &amp; Finished Products</td>
<td>Semi-Finished Products</td>
</tr>
<tr>
<td>Annual Sales</td>
<td>RM400 Million</td>
<td>RM30 Million</td>
<td>RM1 billion</td>
<td>RM5.3 billion (worldwide)</td>
<td>RM26 Million</td>
</tr>
<tr>
<td>Products</td>
<td>Electronic Components</td>
<td>Metal, Aluminum</td>
<td>Home Theatre,</td>
<td>Processors, Motherboards, SSD, Storage, Mobile Chips &amp; Technologies</td>
<td>Street Lanterns, Floodlights, FTTS Power Cabinets, Electronic Ballasts, Photoelectric Control Units (PECU)</td>
</tr>
<tr>
<td>Quality Standards</td>
<td>ISO 9001, ISO 14001</td>
<td>ISO 9001, TS 16949</td>
<td>ISO14001, 9001, OHSAS 18001</td>
<td>ISO14001, 9001, OHSAS 18001 &amp; many more</td>
<td>ISO 9001 ISO 14001</td>
</tr>
</tbody>
</table>

Table 1. Key Profile of the Companies

As shown in Table 1, all the companies have been established for more than 10 years, and possessed the international ISO 9001 quality management standard. All but one firm also possessed the ISO 14001 environmental management standard. Company B was certified in TS16949, an international quality management standard specifically dedicated to the automotive industry. Three companies conducted their business on business-to-business (B2B) platforms (Companies B, C & E) and two companies on both B2B and business-to-customer (B2C) (Companies A & D) transactions. The final products for the five companies showed that two companies produced finished products (Companies A & C), two companies (Companies B & E) manufactured semi-finished products, which were made, treated or sold to another manufacturer for further manufacturing or assembling. Only one company produced both finished and semi-finished products (Company D). In terms of size, four companies (Companies A, B, C & D) recorded more than 1,000 workers and one company (Company E) hired 120 employees. Based on the size of company, Company D was the biggest with annual sales of over RM53 billion (worldwide), followed by Company C with RM1 billion, Company A with RM400 million, and, finally, Companies B & E, each with less than RM40 million in sales.

Reasons for the Adoption of Product Returns Management

There are several reasons for firms to adopt product returns management, including regulatory, products, customers, and certification purposes. The key points and codes from the interview transcripts for Companies A, B, C, D & E are shown in Table 2.
<table>
<thead>
<tr>
<th>Company</th>
<th>Key Points</th>
<th>Open Code Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The main reason is to fulfill the regulatory requirements of product returns for the export market. In addition, we need to serve customers who return defective, faulty or damaged products as agreed in the purchase contract.</td>
<td>Regulatory requirements Serve customers</td>
</tr>
<tr>
<td>B</td>
<td>There are two main reasons. Firstly, by managing product returns, the company will be able to safeguard the products from being copied in the market. This will secure the company in terms of market image as well as maintain the product competitiveness in the market. Another reason is that damaged products can be recycled/refurbished for the secondary market.</td>
<td>Safeguard products image Sales in secondary market</td>
</tr>
<tr>
<td>C</td>
<td>The implementation of the rework/reconditioning process is established to better serve customers, and improve customer satisfaction.</td>
<td>Serve customers</td>
</tr>
<tr>
<td>D</td>
<td>The activities are implemented to serve customers and protect the environment. In fact, this is one of the requirements that needs to be reported in every audit for ISO 14001 environmental management certification.</td>
<td>Serve customers Protect the environment Compliance to certification</td>
</tr>
<tr>
<td>E</td>
<td>Returns management is carried out mainly to serve customers (after sales service) and fulfil the regulatory requirements for the export market.</td>
<td>Serve customers Regulatory requirements</td>
</tr>
</tbody>
</table>

Table 2. Key Reasons to Adopt Product Returns Management

Based on the responses from the interviewees in Table 2, the majority of the companies mentioned that to better serve their customers was the main reason behind the adoption of product returns management (Company A, C, D & E). This is followed by regulatory requirements (Company A & E), to safeguard the image of their products (Company B), for sales in the secondary market (Company B), to protect the environment (Company D), and to comply with the ISO 14001 environmental management standard (Company D). These reasons are consistent with the motives discussed in the study by Hassini, Surti and Searcy (2012), and Willard (2005) that external factors are linked to the adoption of sustainability practices (for example, regulatory requirements, environmentally alert customers and stakeholders, and to fulfill market expectation).

Furthermore, the key reasons discovered also validated the use of the INT as the basis for the theoretical support of the study. The evidence clearly revealed that the main cause is the external factors that influence the adoption of the product returns management. High cost and longer time consumption in returns management affected the logistics cost, which eventually reduced the financial performance of the companies (Jeszka, 2014). The enforcement of regulations in developed countries has increased institutional pressure on companies in developing countries to enhance their environmental capabilities over and above the domestic obligations (Sarkis, Zhu, & Lai, 2011). As such, the existence of external forces provides the net effect for companies to accommodate changes and homogeneity in an institutional environment (DiMaggio & Powell, 1983).

Moreover, from the responses of the participating companies, there is clear evidence that the companies react to institutional pressures through three forms – coercive, mimetic and normative isomorphism drivers (DiMaggio & Powell, 1983). The three institutional isomorphism drivers could be observed in terms of the company responding by implementing an effective product returns management to deal with coercive pressures to comply with the regulatory requirements and mimetic pressures in the quest to serve their customers, safeguard the product image, secure sales in the secondary market and protect the environment. Finally, normative isomorphism is evidently shown through the pressure on the company to comply with the principal condition in the certification of ISO 14001 environmental management standards by adopting product returns management in their reverse flow operations.
Types of Product Returns

In practice, the types of product returns were slightly different across the five responding firms. This signifies that all five companies are somewhat involved in managing their product returns ranging from at least two to all three types of product returns, as revealed in the following key points and codes from the interview transcripts (Table 3).

<table>
<thead>
<tr>
<th>Company</th>
<th>Key Points</th>
<th>Open Code Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The company is currently dealing with several types of product returns: customer returns, out-of-box returns, stock rotation returns, rejection during production returns and warranty returns.</td>
<td>Customer returns Distribution returns Manufacturing returns</td>
</tr>
<tr>
<td>B</td>
<td>The company is involved with collecting back products that were rejected due to quality defects delivered to the customers. The company does not have returns for warranty claims from customers but deals more with the manufacturing of by-products.</td>
<td>Customer returns Manufacturing returns</td>
</tr>
<tr>
<td>C</td>
<td>The other aspect is the defects for sets at the warehouse. We have an auto conveyor system from production to the warehouse. Through the warehousing system, as soon as we discover any product rejection, we will straight away request for withdrawal. Any withdrawal from the warehouse, we re-inspect, rework and then proceed to deliver to the warehouse for shipment to the customers again. When we run our wiring process, we try to salvage the solder dross again. The solder dross source for recycling is obtained from the machine leftovers and leftovers of the trimming process of the components leg. Besides the machine leftovers, the component itself has some leftovers. For warranty or goods rejected by the customers, in our case, we have sales subsidiaries all over the world. Any wear and tear, after-sales services or any return from the customer in which it is claimed that the sets are not functioning will be handled by our sales subsidiaries around the world. In this case, we have a few locations in Europe, the United States and Japan. Even for the African market, we have our subsidiaries to handle the sales, rejections and complaints from customers.</td>
<td>Manufacturing returns Customer returns Distribution returns</td>
</tr>
<tr>
<td>D</td>
<td>Products with certain defects during production or QC sampling, yes, we will go for rework. Our production is using full automation, for example, Wafer Fab, when it comes to certain portion testing and manufacturing; when they put in the package, they will see how the products are working. If not they will quarantine the lot and call for a meeting with the Material Review Board (MRB). If we have an issue, we will call MRB, which has a team of members to verify the failure of products. They will dismantle, if they can repair they will do the rework, if they cannot then the products will be scrapped. Out of all, the CPUs and chipsets recorded the lowest returns. PC motherboards and server motherboards are a little bit higher due to the complexities of the components, which I can estimate at about less than 5% from the volume of sales. I think the rate of returns is higher for products with quality, material and processing issues, which are covered under a special process; namely, Quality Alert Notice (QUAN) Returns. This type of returns is triggered by our engineer in the field who directly serves the customers. In addition, we also have a process called stock rotation or slow moving products. This is dedicated to distributors and not for directs or channel customers. Stock rotation is used to help distributors return the slow moving products with the condition that the products must be in good finished condition – like the original condition when they were shipped to them. Normally, other customers in different regions will provide the demand, so we just re-distribute to them.</td>
<td>Manufacturing returns Customer returns Distribution returns</td>
</tr>
<tr>
<td>E</td>
<td>The majority of the product returns the company is dealing with includes the warranty claims products, defects and faults during production and after delivery.</td>
<td>Customer returns Distribution returns Manufacturing returns</td>
</tr>
</tbody>
</table>

Table 3. Key Points for Types of Product Returns

Based on the analysis of the statement given by the interviewees in Table 3, the types of product returns are identified and summarized in Table 4.
As shown in Table 4, four of the five companies have all three types of product returns. This signifies the importance of establishing product returns management in the process of the firm’s operations. Among the specific returns are warranty claim products for customer returns, out-of-box and stock rotation returns for the distribution returns and manufacturing by-products, scrap and returns for rework for the manufacturing returns. Customer returns, especially for products under warranty, comprise the least returns received by the companies. Hence, similar to firms in a developed economy, Malaysian firms also recognize the importance of managing product returns (Genchev, Richey & Gabler, 2011).

The nature of the product affects the volume of product returns. For example, Company B deals with aluminum-based parts for the automotive industry. Since the products are aluminum-based, the company experiences less distribution returns due to fewer damaged products during transportation and delivery to customers. On the other hand, Company C experiences fewer returns for CPUs and chipsets due to fewer components in the products compared to the PC motherboards and server motherboards, which contain a high number of complex components. Hence, the type of product is significantly influenced by the nature of the product from one company to another (Stock, Speh, & Shear, 2006).

The responding firms provide different levels of after-sales service to their customers. Regardless of the finished products, two firms (Company A & D) serviced supplementary product returns. This is demonstrated by the involvement of the two companies in managing stock rotation returns (resalable returns) by giving distributors incentives to keep the items instead of rejecting or claiming warranty returns. In this case, the nature of the business between B2C and B2B is expected to result in variations of the product returns due to the fact that B2C deals with customer returns, as demonstrated by companies A and D, in addition to manufacturing and distribution returns. Thus, we could say that besides product characteristics, the nature of the business also influences the variations of product returns in reverse flow chains.

**Volume of Product Returns**

The major reason for implementing product returns management in Malaysia is the rising volume of returned products. The huge volume of returns in terms of unsold and defective goods, packaging materials, EoL products, and waste intensifies product returns in the reverse supply chain (Ravi & Shankar, 2005). Table 5 summarizes the key points of the volume of product returns.

<table>
<thead>
<tr>
<th>Company</th>
<th>Customer Returns</th>
<th>Distribution Returns</th>
<th>Manufacturing Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Company B</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>Company C</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Company D</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Company E</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

*Table 4. Types of Product Returns*
As depicted in Table 5, a pattern of similarities can be seen from the findings of the interviews with the five companies. The main reason for the adoption of product returns management is due to the ability to obtain a sufficient amount of product returns, as demonstrated by the situation in Companies B, C and D. When Company A was experiencing a shortage of manufacturing returns, it incorporated its production schedule from the early product development stage with its returns management. On the other hand, the low volume of product returns by Company E distracted it from conducting product recovery on a regular basis. Hence, companies dealing with product returns should manage their reverse supply chain program (Genchev, Richey & Gabler, 2011) to increase performance and gain competitive advantage in the market.

Another worthy aspect to highlight is the prominent practice to outsource product returns management. The design of forward and reverse supply chains must be well coordinated. The reverse supply chain can be incorporated into the existing network or subcontracted to a third party logistics provider (3PL) (Turrisi & Bruccoleri, 2013). The use of 3PL works well for firms that lack the necessary skills, financial ability, or experience. It also works well for firms that have a very low volume of product returns (Stock, Speh & Shear, 2006). For instance,
Company A seeks the help of suppliers through a contingency arrangement in case the volume of materials in the reverse supply chain is too low to meet the production schedule. In addition, Company D outsources certain products or components recovery to the original manufacturers due to their capabilities and the volume of the returns that they may receive from other buyers. Company C, on the other hand, used to outsource to a third party, but has taken back the process to cut cost. The third party role is important to assist manufacturers to manage their reverse supply chain, although it may not be a permanent solution.

As mentioned earlier, there is a difference in terms of handling the variation of product returns between manufacturers conducting B2C and B2B business transactions. Although both types of business focus on product quality to reduce defects, B2C manufacturers must handle the added complexity of product lifecycles and returns from customers (customer returns), which results in a higher volume of returns. In addition, the nature of the characteristics of the product itself may influence the volume of product returns as the recyclable contents may differ from one product to another. As a consequence, the variation in the product returns volume is expected to be distinctive between the type of business transaction and the characteristics of the product.

The Effectiveness of Product Returns Management

The importance of product returns management in the reverse supply chains has increased in the current years mainly due to the growth in the demand of the products assortment and reduced product life cycles, which has had a tremendous impact on company profitability. Nevertheless, despite the importance of reverse supply chains in the logistics systems, scant literature deliberates on their performance in respect of the relatively new reverse logistics concept that limits the number of developed frameworks measuring the performance of reverse supply chains (Shaik & Abdul-Kader, 2012). Moreover, the district concept between reverse supply chains and the supply chain management in many aspects has disallowed the utilization of the established performance measurement of supply chain management (Shaik & Abdul-Kader, 2012) in previous studies. This has created a gap between performance management in reverse supply chains and supply chain management with many important issues remaining unexplored in the present body of literature.

In relation to this, the development of a research framework with the inclusion of suitable indicators is a significant step toward measuring the performance of product returns. The evaluation of performance needs to consider the suitable indicators and approaches for interpreting the results of the product returns workflow. The management can be provided with feedback on vital performance achievement, progress, enquiry on issues and clarification of the overall flow in the supply chain, by assessing the efficiency or effectiveness of activities (Thompson, 1993; Neely, Gregory, & Platts, 2005) in the reverse supply chains. This can certainly help them in making crucial decisions to attain the company objectives and goals (Waggoner, Neely, & Kennerley, 1999). More specifically, effectiveness largely concerns the ability to achieve certain levels of customer requirements in respect of the products or services provided (Neely et al., 2005), as well as the anticipated achievement (Sink, 1985) from the implementation of product returns management in the firms’ reverse operations.

Therefore, several studies have linked the effectiveness of product returns management implementation to the improvement of customer satisfaction and competitiveness in the market. According to Stock et al. (2006), the effectiveness of product returns may yield a higher income, minimize costs, increase profitability as well as improve customer service levels. This is because product returns increase material handling and other logistics related
costs. Thus, product returns must be managed appropriately to enhance performance (Stock et al., 2006). Autry et al. (2001) discovered that effectiveness in the reverse supply chain is directly related to sales volume and customer satisfaction, even though the services provided to customers in the reverse supply chain differ from one industry to another. The ability to measure performance in the reverse supply chain with relevant and quantifiable measures is crucial to provide management with the appropriate performance results, which, in turn, allows them to make the right decision (Waggoner, Neely & Kennerley, 1999). Pertaining to this, the responding firms shared their views and the key points of the interview transcripts are summarized in Table 6.

<table>
<thead>
<tr>
<th>Company</th>
<th>Key Points</th>
<th>Open Code Assigned</th>
</tr>
</thead>
</table>
| A       | We see the activities as crucial for increasing the competitive advantage and company’s performance. Similarly, the activities can contribute to the green competitiveness and green performance of the products in the market. | 1) Company performance  
2) Green performance  
3) Competitive advantage  
4) Green Competitiveness |
| B       | The main reason for the company employing this activity is to take care of product safety. In this way, the company can reduce the imitation products that could affect the company’s competitiveness in the market. For example, using recovered products the company uses them and sells them on the market as a different brand. | 1) Reduce imitation products  
2) Competitive advantage |
| C       | The effect of the recycling initiatives is the reduction of cost and increase in morale, because we feel we are doing something good for the society and environment. From the recycling activities, we are able to increase customer satisfaction by maintaining the price as a consequence of the cost reduction of the recycling efforts. | 1) Cost reduction  
2) Employees morale  
3) Customer satisfaction |
| D       | Moving forward, we actually plan to integrate both flows into one flow. I think the reverse logistics activities are important for extra after-sales service to the customers. Like for the repairable products, why we still do it in-house is because we want to develop the repair experience and technology. We can explore the importance of developing the in-house expertise rather than passing this to the third party. Let us say we have something to repair and we get somebody to repair for us but we ourselves do not know the requirement that is the most difficult thing, especially to face the customers. If we are doing the repairs, definitely we know the resources and technology needed to execute the repair functions. | 1) Extra service  
2) Experience  
3) Technology know-how |
| E       | The returns management is carried out mainly for customer satisfaction and loyalty. | 1) Customer satisfaction  
2) Customer loyalty |

Table 6. Key Points for the Effectiveness of Product Returns Management

As shown in Table 6, several measures for effectiveness have been mentioned as being interconnected by representatives of the companies. Overall, the two most recognized measures of effectiveness of product returns management are the ability to increase customer satisfaction (Companies C & E) and the company’s competitive advantage (Companies A & B). Customer loyalty, as mentioned by Company E, measures the customer’s repeat purchases as a result of customer satisfaction with the original purchase and product returns management (Stock et al., 2006). Looking at the variations of the measures of effectiveness, there are many internal benefits that the company can enjoy in implementing product returns management. In addition, these benefits are expected to influence the external benefits, such as customer satisfaction and competitive advantage. For instance, company performance and green performance (Company A), cost reduction and increased employee morale (Company C) and gaining experience and technology know-how (Company D). The ability to protect the company’s image by reducing imitation products and increasing green competitiveness, as mentioned by Company B and Company A, respectively, are highly related to external performance, which, eventually, could lead to higher company performance. In addition, Company D perceived the effectiveness of product returns management as a way to provide extra service to customers, which indicates the efforts taken by the company to increase customer satisfaction and competitiveness.
6.0 PROPOSITION DEVELOPMENT

In this article, the term “proposition” refers to a statement which describes a possible relationship between the adoption of the input and the output of product returns management. These propositions have been developed based on the institutional theory perspective and supported by the interviews. Based on the interviews, the input for adopting product return management can be differentiated into two major inputs – namely the type of product returns and product return volume. These inputs are expected to influence the adoption of product returns management, and, as a consequence (output), they can result in the effectiveness of the activity, as discussed in the following sections.

The influence of the type of product returns on the adoption of product returns management

Taking into account the review of the literature and interview results, although there are various types of returns, they can generally be distinguished in three basic types: customer, distribution and manufacturing returns. The types of returns that exist in each company are different, depending on the nature of the business and the products manufactured from the various materials that may, or may not, have recyclable content. To achieve business sustainability, companies must exploit the benefits of all types of product returns by incorporating an appropriate design for both forward and reverse flow chains, as well as product disposal in an environmentally friendly manner (Guide Jr. et al., 2003). As clearly described by Genchev et al. (2011), it is necessary for firms to conduct a well-structured management process plan with a high control of reverse flow operations when facing the many types of returns. Hence, the type of returns for each of the companies requires an extension of the process, which inevitably forces them to participate in the reverse flow operations.

The theory of the INT posits on how firms could deal with the external pressures by adopting the appropriate measure and practice in order to counter the pressures. Failing to react to the pressures can cause detrimental effects that include threatening the firm’s survival in the market. In view of this, the study has identified that the extant forces originated from customers are behind the magnitude of customer, distribution and manufacturing returns and they play a significant role in influencing the firm’s adoption in the product returns management. From a manufacturer’s viewpoint, the overall behavior of customer that values lenient returns policies and subsequently responds by returning the used products (customer returns) to the manufacturers could be the basis for firms to achieve competitiveness (Padmanabhan & Png, 1997). Correspondingly, previous studies have delineated the overall customer behavior towards the returns, which is based on the combination of process as well as the product attributes (Humphreys & Williams, 1996) that clearly explain on the forces from customers on the preconditioned demand of flexible returns policies (process attributes) towards the magnitude of customer returns. In this case, a liberated returns policy induces higher possibilities of the returns (Davis, Hagerty, & Gerstner, 1998). As such, as the level of customer returns is higher from the well-received returns policies, this could lead firms to effectively manage the product returns in their reverse flow operations.

Besides that, the behavior of customers toward product attributes can be driven by the returns with deficiencies in fulfilling customers’ needs and expectations as well as the product quality issues (Ferguson, Guide, & Souza Jr., 2006; Guide Jr. et al., 2006). Quality problem is one of the main causes of the commercial returns that necessitate the establishment of the return policy (Yoo, 2014). According to Jacobs, Chase and Aquilano (2008), quality problem does not only relate to the defects, but it is also associated with the product design, that contains a particular set of specifications or features to match the customers’ desires and preferences.
Nevertheless, the amount of product returns of quality issues and the failure to fulfill the customers’ needs are reported differently from distinct industry/players in the literature. A survey conducted by the Reverse Logistics Executive Council (1999) in an apparel industry revealed that high product returns were caused by quality issues than the discrepancy in the product design versus the consumers’ needs. On the other hand, Guide Jr. et al. (2006) found from the survey conducted on the Hewlett-Packard printer firm that the returns from customer dissatisfaction were higher than the quality problems. Similarly, Hu, Li and Govindan (2014) in their study on retailer/vendor manages consignment inventory (RMCI/VMCI) programs discovered high percentage of customer returns mainly from the returns that failed to meet customers’ desires or expectations and not problems related to product defects. Thus, this implies on the external forces that are derived from customer behavior as grounded in INT could trigger the high magnitude of customer returns which eventually leads to the firm’s adoption of product returns management.

The INT can be used to explain the influence of external forces toward the magnitude of distribution and manufacturing returns. In manufacturing returns, the product lifecycle stage and the speed of technology change influence the degree of product returns (Guide Jr., Jayaraman, Srivastava, & Benton, 2000). On the other hand, distribution returns such as product recalls are initiated by manufacturers or suppliers due to the right of customers or retailers to return due to damaged, incompliance with the order, expired and unsold goods (Jeszka, 2014). Thus, the high magnitude received from the manufacturing and distribution returns from the underlying philosophies in the INT has stimulated firms into the adoption of product returns management in order to achieve the effectiveness of the adoption.

However, to successfully implement product returns management, it requires the fulfillment of certain conditions that originate from the nature of the type of product returns. According to Thierry et al. (1995), among the important factors that manufacturers need to consider are the assessment of the size and uncertainty for each kind of product returns. This is because each type of reverse flow is distinct (Thierry et al., 1995), and, hence, it requires a suitable reverse supply chain process in order to maximize the recovery of product returns (Guide Jr. et al., 2003). As such, this strongly suggests that the type of product returns has a positive relationship with the adoption of product returns management. Thus, this leads to the proposition:

*Proposition 1: The type of product returns positively impacts the adoption of product returns management*

**The influence of product returns volume on the adoption of product returns management**

It has been recognized that the escalating volume of product returns can contribute to the difficulties in the existing product reverse flow, which is already complex and challenging (Srivastava & Srivastava, 2006). As such, it is of paramount importance for firms to develop and adopt product returns management, despite the complexities and the fact that the processes are quite different between the forward and reverse supply chains (Stock et al., 2002) to cater for the increasing amount of product returns from the three sources identified earlier – customer, distribution and manufacturing returns.

The study underlines the critical role that product returns plays in furthering the INT’s external forces- particularly to influence the adoption of product returns management. In relation to this, two main forces were identified behind the reason why firms are managing the product returns; the economic motives and the take-back regulations (Krikke et al., 2013). The pressure
on the economic feasibility of the product returns management is induced by the market requirements - either primary or secondary market where the recovered products are intended to sell. For instance, the recovered products sold in the secondary market at the lower price due to the reduced product quality after disassembly, inspection or testing, repair or replacement components carried out on the partial damage of the product returns (Ji, 2007) have pressured the manufacturers to reduce costs by increasing the operational effectiveness, salvaging high recovery rates for the unsalable returns and utilizing suitable recovery strategy for the salable returns (Stock et al., 2006). As such, the economic viabilities to sell at the lower price may induce firms with higher volume of product returns to achieve the economy of scale operations, which subsequently leads to the firms’ adoption of product returns management.

Another main pressure behind the escalating volume of product returns is the stringent take-back regulation and waste of electrical, electronic and equipment (WEEE) disposal regulation imposed by the export countries (Turrisi & Bruccoleri, 2013) as well as the extended producer responsibility (EPR) and mandatory recycling scheme (Krikke et al., 2013). These pressures occur as a result of the threats of the nonconformity through substantial penalties and fines (Davidson & Worrell, 2001), that inevitably lead the firms into full compliance towards the regulations. Hence, the regulatory pressures as indicated in the INT have stimulated higher volume of product returns, which has subsequently impacted firms into the adoption of product returns management and the attainment of competitiveness in the market.

Genchev et al. (2011) identified several important indicators in the reverse logistics program formally established to assess the product returns for the overall improvement in the reverse operations (Rogers et al., 2002). Among the key indicators shared by the research participants are the volume of product returns, type of product returns, value in dollars, sales percentage and utilization of resources, such as manpower, that are devoted to product returns management (Genchev et al., 2011). Similarly, according to Thierry et al. (1995), besides the volume of the returns, the quality, timing and location of product returns are important to assist manufacturers with the information, particularly in respect of the source of the used products. This lends weight to the argument that the product returns volume has a positive relationship with the adoption of product returns management. Hence, this leads to the proposition:

**Proposition 2: Product returns volume positively impacts the adoption of product returns management**

**The influence of the adoption of product returns management on the effectiveness of product returns management**

The effectiveness of the organizational activities, such as the adoption of product returns management, can be assessed through performance measurement (Thompson, 1993; Neely, Gregory, & Platts, 2005). Nevertheless, performance measurement and the analysis of the adoption of product returns management remain limited, particularly concerning the specific guidelines pertaining to the measurement of product returns recovery operations and improvement analysis (Nagalingam, Kuik & Amer, 2013). As such, the identification of the right indicator to measure the effectiveness of product returns management is important, as the management will be able to be provided with vital information concerning the progress of the performance, the results of the problem analysis and the transparency to support the management in making the right decision for the company (Waggoner et al., 1999).

In relation to this, the INT provides fundamental understanding on how the external forces strike toward the extent of product returns influences the effectiveness of product returns
management. In a study conducted by Ye, Zhao, Prahinski and Li (2013), three types of pressures that are derived from the government, customer and competitor have significantly influenced the management’s attitude towards the adoption of product returns management in the reverse supply chains. As such, these constitute the basis of pressures in the institutional theory that can provide clear insights into the reason why manufacturers engage in product returns, which may lead to the effectiveness of product returns management. Furthermore, the three forms of coercive, mimetic and normative isomorphism drivers as suggested by DiMaggio and Powell (1983) also contribute to the overall efforts of companies to adopt product returns management and respond to the pressures from each specific driver in a proper way. For instance, the coercive pressures derived from government regulations, normative pressures from customers and mimetic isomorphism to imitate the practices based on competition (Sarkis et al., 2011) have been used by firms to respond to the respective pressures in order to stay competitive in the market.

In the same vein, many indicators pertaining to the effectiveness of the adoption of product returns management have been mentioned in past literature. For instance, the traditional focus of the adoption of product returns management was on the cost reduction activity (Rogers and Tibben-Lembke, 2001). However, as time passes, the focus has changed toward the recovery of the returns that can offer a good business opportunity, embrace the ambition for sustainability and achieve competitive advantage (De Koster, De Brito & Van de Vende, 2002; Jack et al., 2010). In the case study of a company in a chemical blending business, French (2008) found that the reuse program adopted had become fruitful in terms of limiting the volume of future product returns for potential disposal and eventually contributes to the company’s sustainability performance. To further support this statement, Stock et al. (2006) stressed that the adoption of product returns management can substantially reduce the costs through efficiency in the operations, excelling in the disposition strategy to increase the potential of reselling, and the high recovery value for the products that are unable to resell, as well as other strategies. From other perspectives, these benefits can be categorized into internal and external benefits that companies can grasp in the adoption of product returns management. Hence, in order to achieve successful results for the implementation of product returns, companies should consider a holistic approach to performance measurement in product returns with a variety of the indicators for the overall effectiveness of product returns management. In view of this, it seems clear that the adoption of product returns management has a positive relationship with the effectiveness of managing the activities. Hence, this leads to the following proposition:

Proposition 3: The degree of adoption of product returns management positively impacts the effectiveness of product returns management

7.0 DISCUSSION

The preliminary evidence in the preceding discussions suggests that the proposed theoretical framework for the input, process and output/impacts of product returns management represents the main contribution of this study. The theoretical framework is developed based on the interviews with five manufacturing companies in Malaysia by utilizing a case study methodology to explore the adoption of product returns management, which is still new in the context of research in Malaysia. The input is represented by the type and volume of returns, while the process corresponds to the adoption of product returns management, and the outcome is the effectiveness of product returns management. The proposed framework has attempted to provide a better explanation of the extent of product returns management including its drivers (input) and the impact (output) among the sample of the study, which, overall is still lacking in
terms of the model of adoption to increase the environmental performance among manufacturing organizations. As such, this has led to the three propositions that can be further tested through empirical survey methodology with a larger sample of study.

Despite the fact that case study methodology contains several pros and cons in deriving the reliability of the results, this study has reduced the gaps by undertaking both exploratory and explanatory research methods to provide an effective interpretation of the study area. By providing the advantages and at the same time eliminating the disadvantages of both methods, the study contributes to our understanding by providing a better structure with an appropriate degree of accuracy to represent the real condition of the practices among Malaysian manufacturers. Through a comparison with the various methodologies of past studies, which were generally carried out on exploratory (as prevalent in the study by Mollenkopf, Russo and Frankel, 2007; Gobbi, 2011) and mathematical modeling (the study by Guide Jr. et al., 2006; Nagalingam et al., 2013; Srivastava and Srivastava, 2006), the development and enrichment of the INT in the area of product returns can be further supported, particularly from the empirical survey to test the propositions in the explanatory part of the study. Hence, this study offers an alternative explanation concerning the adoption and effectiveness of the product returns process, which depends on several main drivers in the reverse supply chains.

From the interview results, the main forces driving the adoption of product returns management relate to the desire to serve customers to increase the satisfaction level. In addition, regulatory compliance for the export market is the major reason for adopting product returns management. Other reasons are to safeguard their products image, sales expansion in the secondary market, protect the environment, and to comply with ISO 14001 certification requirements. Moreover, the analysis of the interview results clearly showed that the companies predominantly possess the three types of product returns, which was one of the main reasons for establishing product returns management in the operational conduct of the respective organizations. Product returns management is one of the company efforts to achieve the objective of sustainability in the supply chain management. The influence on the variations of product returns may come from two significant factors – the products’ characteristics and the nature of business between B2C and B2B. For logical reasons, B2C business transaction companies receive a higher number of product returns, as they are involved with the end customers compared to B2B companies, which are confined to managing manufacturing and distribution returns only. In addition, it was discovered that the ability to obtain sufficient amounts of product returns is another reason to adopt product returns management. Similar to the types of returns, the product returns volume is contingent on the type of business transaction and the nature of the product characteristics. Pertaining to the effectiveness of product returns management, the interview results revealed the benefits that the companies can obtain from the adoption of product returns management, despite the lack of the EPR structure of enforcement among the Malaysian manufacturers. These benefits can be further divided into the internal and external benefits that firms can obtain from the adoption of product returns management. The benefits are various with the predominant advantages identified comprising achieving the customer’s satisfaction as well as increasing the company’s competitive advantage.

As with all such studies, there are limitations that may influence the results concerning the development of the product returns theory. There are obvious limitations associated with the choice of industry – electrical and electronics, and automotive – as the cases for the interviews to be conducted. Another limitation that is noticeable is the coverage of the samples that are concentrated in the northern part of Peninsular Malaysia. The study may contribute to the further development of theories in product returns if the choice of industry and geographical
coverage can be expanded for better accuracy of the study results. Nevertheless, these problems can be solved through the empirical survey methodologies by extending the tests on the three propositions suggested in this study.

**Implications of the Study**

From a practical point of view, this study provides the key drivers in implementing product returns management and the benefits that the manufacturers can achieve from the adoption. As such, the study can enhance the understanding of manufacturing managers and other practitioners in the logistics industry concerning the respective concepts so that appropriate strategies can be developed in designing an effective product returns management program. In addition, the findings of the study can contribute to the overall knowledge and provide strategic implications to the manufacturers in reaping the benefits of implementing product returns.

In terms of the theoretical implications, this study is explicitly grounded on the theoretical foundation of the INT, which provides a practical foundation for explaining the effect of the external pressures toward the variability of the type and volume of products returns. The increasing pressures placed on the manufacturers to efficiently manage and recover product returns have come from several parties outside the firms, such as the government, customers, non-government organizations and other related stakeholders. External forces, such as the growing international competition, shorter product life cycles, increased environmental legislation and marketing take back policies from the sellers, can increase the type and volume of product returns, which, inevitably, will coerce the manufacturers into the adoption of product returns management in their reverse supply chain operations. Hence, the findings of the study can contribute to the present body of knowledge concerning the INT in terms of understanding the effect of external pressure (isomorphism) from outside the firms, which, ultimately, can influence the manufacturers to recover and conduct proper disposal of the returns accordingly.

**8.0 CONCLUSION**

As a conclusion, the progress of product returns management, particularly in developing countries, is necessary to balance between the country’s efforts toward economic and sustainable development. Based on the study’s findings, the presence of manufacturers’ product returns management platforms can assist Malaysia in taking another step toward sustainability. This is dependent upon the manufacturers’ persistent efforts in developing the product returns process in pursuit of leveraging the optimal internal and external benefits to achieve a high performance and competitive advantage. All of this has happened, despite the country’s legal EPR lacking the structure of enforcement from the government, and the fact that many companies are still reactive in responding to the demands for sustainability. Furthermore, the study has proposed a theoretical framework derived from its exploratory part, which is further validated through the explanatory research methods. In relation to this, the study has identified the input variable, which consists of the type and volume of returns, while the adoption of product returns management represents the process, and the output is the effectiveness of the adoption of product returns management. The development of a theoretical framework has several practical and theoretical implications.

**ACKNOWLEDGEMENTS**

The authors would like to thank the anonymous reviewers for providing us with constructive and valuable comments that have helped considerably in improving the content of the paper.
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