Institutional pressures, resources commitment, and returns management

Yi-Chun Huang, Min-Li Yang and Ying-Jiuan Wong

Department of Business Administration, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan

Abstract

Purpose – This study aims to explore the relationships among institutional pressures, commitment of resources and returns management. Returns management is regarded as a part of supply chain management. However, the research in returns management has received much less attention. To bridge the gap, this study concerns key concepts from two important schools of thought, i.e. institutional theory and the resource-based view, to build up the research model.

Design/methodology/approach – Retailers and maintenance providers in the 3C industry (computers, communication and consumer electronics) in Taiwan were surveyed, and the statistical methods of hierarchical and moderated regression were used to examine the relationships among institutional pressures, commitment of resources and returns management.

Findings – Institutional pressures, comprising non-market and market pressures, affect the implementation of returns management (product return practices and product recovery practices). Commitments of resources positively and significantly moderate the relationship between the pressures imposed by non-market and market actors and product return practices and product recovery practices.

Research limitations/implications – This study investigates only the factors that drive returns management. Future research can examine the relationship between the antecedents and consequences of returns management. Furthermore, returns management may become increasingly critical for firms to develop and perform corporate social responsibility (CSR). Therefore, future research can investigate the relationship between CSR practices and returns management.

Practical implications – This research suggests that managers under institutional pressures should continually pay attention to the effects of external factors on returns management. Additionally, the results reveal that a commitment of resources can reinforce the relationship between the pressures imposed by non-market and market actors and the implementation of returns management. Under significant institutional pressures and resource constraints, managers may increase the effectiveness of returns management while attending to the concerns of non-market and market actors.

Originality/value – This study presents a model that considers three major explicative variables: institutional pressures, resources commitment and returns management. It is the first investigation to integrate three streams of literature on institutional theory, the resource-based view and returns management.

Keywords Supply-chain management, Taiwan, Resource management

Paper type Research paper

1. Introduction

Returns management, which is also called reverse supply chains (RSCs), is a critical part of supply chain management (SCM) (Blackburn *et al.*, 2004; De la Fuente *et al.*, 2008; Rogers *et al.*, 2002; van Hoek, 1999). RSCs refer to the series of activities that are required to retrieve a used product from a customer and either dispose of it or recover value from it (Guide and Van Vassenhove, 2002; Prahinski and Kocabasoglu, 2006). Most SCM studies focus on forward movements, but the reverse flow of product from consumers to upstream firms has not received much attention (Gobbi, 2008; Li and Olorunniwo, 2008; Prahinski and Kocabasoglu, 2006). Returns management is a complex process that comprises five stages: returns avoidance, receiving, processing, sortation and disposition. Most companies must deal with all of these stages of returns management, irrespective of industry or product type (Mollenkopf *et al.*, 2011; Rogers *et al.*, 2002; Stock and Mulki, 2009). Yet, organizations are likely to perceive product return activities as an additional expenditure to their normal overhead costs (Guide *et al.*, 2006). Therefore, they may neglect the potential value that can be gained by effective returns management (Brodin and Anderson, 2008; Mollenkopf *et al.*, 2011). In recent years, strict environmental regulations, rules about product disposal and customer demands for better service have forced firms to reconsider

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their views and focus on better implementation of returns management (Prahinski and Kocabasoglu, 2006; Ye *et al.*, 2013). Furthermore, good returns management can be a differential strategy for firms, while also providing a means for gaining market advantage (Rogers *et al.*, 2002). Therefore, managers endeavor to design, plan and control returns management so that their firms may effectively process returned products from customers, recover their value and use or sell them again (Blackburn *et al.*, 2004; Gobbi, 2008). Some proactive companies, such as Canon, Cisco, IBM, Nokia and Recellular, have paid a great deal of attention on activities of returns management (Nidumolu *et al.*, 2009).

Several issues associated with returns management have also been addressed by scholars in recent years. For example, numerous studies have targeted product returns, reverse logistics, product recovery, remanufacturing and closed-loop supply chain, in relation to returns management (Mollenkopf *et al.*, 2007; Rogers and Tibben-Lembke, 2001; Rogers *et al.*, 2002; van Hoek, 1999; Wu and Cheng, 2006). Additionally, Reviewing the studies of returns management reveals that there are both external and internal drivers for returns management. For instance, in terms of external drivers, some have argued that at least one of four external forces – customers, suppliers, competitors and government agencies – may directly influence the returns and reverse logistics activities of a firm (Álvarez-Gil *et al.*, 2007; Gonzalez-Benito and Gonzalez-Benito, 2006; Rogers *et al.*, 2002). Mollenkopf *et al.* (2011) also emphasized that the external business environment has emerged as a crucial determinant for firms to manage the product returns process. On the other hand, in terms of internal drivers, several scholars contend that resource commitments are highly important to the success of returns and reverse logistics-related activities (Daugherty *et al.*, 2005; Huang *et al.*, 2012; Li and Olorunniwo, 2008; Richey *et al.*, 2004). Yet, in spite of recent advances in strategic returns management, the determinants of successful returns management remain largely unexplored academically. Therefore, through the application of multiple theoretical perspectives, this study proposes that external and internal factors influence the implementation of returns management.

To construct a comprehensive research framework, this study links institutional theory and the resource-based view (RBV). Institutional theory provides a framework for explaining how external pressures affect an organization's choice of environmental strategy (Clemens and Douglas, 2006; Delmas and Toffel, 2008; Jennings and Zandbergen, 1995). The theory also suggests that firms must conform to social expectations (Jennings and Zandbergen, 1995; Oliver, 1997), as the major factors that affect organizational decisions are the actions of other organizations (DiMaggio and Powell, 1983; Scott, 2014). Moreover, to gain a broader understanding of returns management and how it is affected by external institutional factors, institutional theory is used to elucidate how external pressures affect the implementation of returns management. However, describing divergent organizational change solely in reference to institutional forces does not suffice. In recent years, many scholars have skillfully linked institutional theory and the RBV to probe strategic issues (Clemens and Douglas, 2006; Oliver, 1997). For instance, while Clemens and Douglas (2006) found that

external coercion is positively related to voluntary green initiatives, the relationship is contextual, depending on the amount of superior resources that the firm has dedicated to environmental activities. Hence, by applying institutional theory and the RBV, this study is able to examine relationships among institutional pressures, commitment of resources and returns management.

Logistic costs in Taiwan are increasing every year. The 2013 Taiwan Logistics Yearbook not only showed that these costs account for 12.07 per cent of Taiwan's GDP but also that the major consumer industry in the country, the 3C industry, represents 38.3 per cent of all industrial output (Ministry of Economic Affairs Taiwan, 2014). Additionally, of the approximately 2.9 million products that were recovered in 2012, roughly 1.7 million were electronic and electrical devices (Environmental Protection Administration Taiwan, 2013). Clearly, the overall amount of returns activity in Taiwan's developing economy is large and growing. Additionally, many institutional forces related to Taiwan's legislation and regulations are shifting. For example, consumer protection law and increasing retailer power have effectively changed the approach of retailers regarding returns activities. Taiwan's retailers, using their growing channel power, are implementing distinct returns policies to improve customer satisfaction. Therefore, the factors that affect returns management in Taiwan are worth exploring.

Stock and Mulki (2009) found that retailers can recover a higher percentage of product value than wholesalers and manufacturers, as retailers are close to the point of sale, which means that they more options for disposition and a shorter processing time. This finding highlights the challenge for retailers and wholesalers. On the one hand, they are closer to customers in the supply chain than manufacturers; yet, on the other hand, they must also process their customer returns, instead of simply forwarding the returned products to suppliers. However, few studies have been conducted on returns management at retail stores. Accordingly, this study empirically investigates how external and internal forces influence returns management in retail and maintenance stores in the 3Cs (computers, communication and consumer electronics) sector in Taiwan.

This paper is organized as follows. The following section will present a review of the literature on returns management, which will be followed by the theoretical background and foundation on which the hypotheses are proposed. Section 3 will introduce the design and implementation of this research, and a statistical analysis of its results. Section 5 presents major research and managerial implications. Finally, the limitations will be addressed and suggestions for future research provided.

2. Theoretical framework and hypotheses

2.1 Research on returns management
A review of the research on returns management reveals that several authors, such as Rogers and Tibben-lembke (2001), have investigated reverse logistics practices, including issues associated with product returns and barriers to implementing good reverse logistics practices, based on surveys of 311 respondents in the USA. In fact, Rogers *et al.* (2002) regarded returns management as the process of SCM that requires

planning and effective implementation throughout the supply chain, and emphasized that customer service and environmental and legal issues often force many firms to improve their returns management. Knemeyer *et al.* (2002) used qualitative research method and conducted 48 interviews to investigate the availability of reverse logistics systems that efficiently and effectively deal with end-of-life computers. Blackburn *et al.* (2004) argued that managers must be sensitive to the value of time when dealing with product returns. Thus, they developed the concept of preponement and emphasized that for the commercial return of time-sensitive products, the speed at which those products are received, inspected, refurbished and remarketed is critical to recapturing most of the value. However, Wu and Cheng (2006) argued that processing product returns is not economically feasible, as the lower values of recovered products, given the cost of recovery, exceed the recovered value. In addition, Srivastava and Srivastava (2006) argue that economic, regulatory and consumer pressures drive product returns globally. Moreover, Prahinski and Kocabasoglu (2006) argued that environmental regulations and increasing costs associated with product disposal require firms to handle an increasing number of product returns. Meanwhile, they reviewed the literature on product returns management and developed ten research propositions for future research.

Mollenkopf *et al.* (2007) applied qualitative methods and interviewed managers at five Italian firms. They argued that the external environments are set by customers, and competitive and regulatory considerations determine how a firm manages its returns activities. Meanwhile, Li and Olorunniwo (2008) conducted the case study from three firms, and they proposed returns process and suggested some key strategic issues that firms may use in returns management to gain competitive advantage. Stock and Mulki (2009) performed a survey to examine the processing of product returns within three major industrial sectors: manufacturing, wholesale/distribution and retailing, to generate criteria for evaluating the effectiveness and efficiency of the processing of product returns. While all of these studies argue that external factors influence returns management. In addition, some studies have examined internal factors that affect reverse logistics performance, drawing on resource-based theory (Daugherty *et al.*, 2001, 2005; Richey *et al.*, 2004). Mollenkopf *et al.* (2011) argued that when returns management is regarded as an issue related to a firm's competitiveness, the joint role of operations and marketing is imperative to success. Such studies have emphasized that internal factors, especially commitment of resources, influence the efficiency and effectiveness of returns management.

Based on the above review of the literature, few theory-based studies have focused on returns management. Furthermore, most studies in the field of returns management seem to take a single disciplinary perspective, focused on tactical and operating aspects, and involve case studies as well as the case of firms in the European Union and the USA. Thus, to fill the research gap, this study utilizes institutional theory to explore the effects of institutional pressures on returns management. Additionally, an RBV is taken to examine how the commitment of resources influences returns management. When institutional pressures and firm resources

are considered simultaneously in environmental management practices, Clemens and Douglas (2006) stated that superior firm resources moderate the effects between coercive forces and voluntary green initiatives. In addition, Wu *et al.* (2012) propose that institutional pressures can moderate the relationship between organizational internal resources and green SCM. Ye *et al.* (2013) examined the antecedents and outcomes of reverse logistics implementation, mediated by the postures of the top managers. However, there is a lack of research on the commitment of resource moderating the relationship between institutional pressures and returns management. Therefore, this topic merits further research. Finally, this study extends current empirical research to provide a perspective of returns management in Taiwan.

2.2 Components of returns management

In recent academic literature, the components of returns management have been well identified, but these components are as heterogeneous as the purposes attributed to returns management. Thierry *et al.* (1995) argued that product recovery management refers to the management of all used and discharged products, components and materials that fall under the responsibility of a manufacturing company. Rogers *et al.* (2002) defined returns management as all activities related to product returns, which include avoidance, gate-keeping, reverse logistics and disposal. Some scholars have argued that returns management is organized to implement five key processes: product acquisition, reverse logistics, inspection and disposition, remanufacturing, and resale and distribution (Blackburn *et al.*, 2004; Guide and Van Vassenhove, 2002; Prahinski and Kocabasoglu, 2006). Moreover, Stock *et al.* (2006) argued that the returns process comprises five stages: receive, sort and stage, process, analyze and support. Additionally, Stock and Mulki (2009) divided the product returns process into four steps: receiving, processing, sortation and disposition. In addition, Mollenkopf *et al.* (2011, p. 392) suggested that:

> [. . .] within an organization, activities related to returns management include return authorization, reverse logistics, gate keeping, avoidance, product recovery, disposition and processing, and crediting within an organization.

With reference to previous works, this study argues that in retail and maintenance stores, activities that are related to the returns management involve five steps: returns avoidance, receiving, processing, sortation and disposition (Mollenkopf *et al.*, 2011; Rogers *et al.*, 2002; Stock and Mulki, 2009). Returns avoidance refers to efforts made to avoid returns from occurring. Receiving involves the unloading and distribution of product returns to processing centers. Processing comprises activities like data entry and the issuance of customer credits. Sortation involves inspecting returns and routing them to a disposition point. Disposition involves returning products to inventory or temporary storage, repacking, repairing, refurbishing or remanufacturing.

This study refers to previous research on dividing returns management into product return practices and product recovery practices (Blackburn *et al.*, 2004; Gobbi, 2008; Guide and Van Vassenhove, 2002; Mollenkopf *et al.*, 2011; Prahinski and Kocabasoglu, 2006; Thierry *et al.*, 1995). Product return practices include returns avoidance, receiving

and processing a used or defective product from the point of consumption to the point of origin for the purpose of remanufacturing, reuse or destruction. Product recovery practices refer to recovering the value of used or defective products by repairing, reconditioning, remanufacturing and/or recycling methods.

2.3 Institutional pressures as driving variables

An organizational field is defined as comprising "those organizations that constitute a recognized area of institutional life: key suppliers, resources and product consumers, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio and Powell, 1983, p. 148).

Thus, several scholars (Clemens and Douglas, 2006; Hoffman, 1999; Majumdar and Marcus, 2001) have argued that institutional pressures can drive firms toward environmental practices. Moreover, Delmas and Toffel (2008) leveraged institutional theory when they proposed that stakeholders, including governments, regulators, customers, competitors, community and environmental interest groups and industry associations, impose institutional pressures on firms. Others have also mentioned that pressures from field actors, including customers, regulators, legislators, local communities and environmental activist organizations, have motivated firms to implement returns and reverse logistics (Álvarez-Gil et al., 2007; Gonzalez-Benito and Gonzalez-Benito, 2006; Rogers et al., 2002; Srivastava and Srivastava, 2006). Delmas and Toffel (2008) further divided these institutional pressures into non-market (local community, environmental organizations, media and government/regulators) and market (competitors, customers and suppliers) pressures.

The literature on returns management stresses the importance of various pressure groups in implementing such programs. Companies interact with actors in their market environment (customers and suppliers) through economic transactions (Gobbi, 2008; Mollenkopf et al., 2007; Rogers et al., 2002; Srivastava and Srivastava, 2006), whereas actors in the non-market environment (governmental agencies and non-governmental organizations) of firms are interested in social, political and legal issues (Álvarez-Gil et al., 2007; Rogers et al., 2002; Srivastava and Srivastava, 2006). In other words, actors have various claims, which a firm can satisfy through returns practices. For example, customers may respond to liberal returns policies, causing more returns activities (Rogers et al., 2002; Stock et al., 2006). Recycling may satisfy the demand of non-governmental organizations for responsible environmental behavior. Therefore, this study divides the organizational field into two main sets of actors, which are non-market and market actors (Delmas and Toffel, 2008) and emphasizes that both may be subject to institutional pressures.

2.3.1 Receptivity of managers to pressures from non-market actors

Non-market actors include the local community, environmental organizations, media and government/regulators that can affect the firm's implementation of product return practices and recovery practices. Some research noted that the implementation barriers of reverse logistics are lacks of regulation to motivate firms to usage of recovered materials

and components (Chileshe et al., 2015; Lau and Wang, 2009). Therefore, regulations or directives are important factors to drive firms to implement product return practices and recovery practices.

For example, government/regulators have the potential to control, legislate or otherwise affect organizational policies and practices (Brodin and Anderson, 2008; Mollenkopf et al., 2007; Rogers et al., 2002). For example, Fleischmann (2001) stressed that to comply with environmental product take back regulations, original equipment manufacturers are held responsible for the take back and recovery of products with the objective of recapturing value from the used products. Knemeyer et al. (2002) observed that the regulatory sector influences the reverse logistics of end-of-life computers in the areas of disposal and input sourcing. In addition, governments in developing countries have become increasingly concerned about the threat that end-of-life phones and other electronic devices, which are exported for disposal, may pose to both human and environmental safety (Nidumolu et al., 2009). Meanwhile, several researchers have argued that governments (the regulatory sector) exert the greatest forces on the product return and product recovery practices. For instance, Murphy and Poist (2003) argued that Canada and Western Europe have been more proactive than the USA in returns management. Thus, companies in these areas are also more progressive in their handing of environmental issues associated with product return and product recovery practices.

De Brito and Dekker (2004) also argued that legislation is the most important driver of product return and product recovery practices, owing to the increasing number of directives, regulations and take back obligations that have been approved in several countries worldwide, which cover many products (batteries, end-of-life vehicles, packaging, electrical and electronic appliances and others). Mollenkopf et al. (2011) emphasized that regulatory changes in the retail market, such as the waste electrical and electronic equipment (WEEE) and the restriction of hazardous substances (RoHS) directives, have intensified the implementation of products return practices. Additionally, Canning (2006) argued that many recovery and reuse/recycling programs were developed in response to European Community legislation concerning WEEE that came into effect in 2005. Zhu and Sarkis (2006) noted that environmental regulation imposes the most pervasive pressures on Chinese companies. Rahman and Subramanian (2012) identified government regulation as one of the key drivers affecting the implementation of end-of-life computer recycling operations in Australia.

Álvarez-Gil et al. (2007) argued that stakeholders may also affect the implementation of returns and reverse logistics. Gobbi (2008) argued that pressure from external stakeholders, such as society, industry associations, environmental organizations and media motivates managers to focus on identifying and understanding the role of stakeholders in product return and product recovery practices. However, some studies argued that managers pay more attention to forward flow than reverse flow in SCM (Blackburn et al., 2004; Prahinski and Kocabasoglu, 2006). Thus, based on the above discussion, this study proposes the following hypotheses:

H1. The receptivity of managers to pressures from non-market actors is positively correlated with a firm's implementation of product return practices.

H2. The receptivity of managers to pressures from non-market actors is positively correlated with a firm's implementation of product recovery practices.

2.3.2 Receptivity of managers to pressures from market actors
Market actors include customers, suppliers and competitors that may influence a firm's product return and product recovery practices. For instance, several authors (Gobbi, 2008; Gonzalez-Benito and Gonzalez-Benito, 2006; Rogers *et al.*, 2002; Srivastava and Srivastava, 2006) have noted the effect of customers on product return and recovery practices. In fact, Toffel (2004) stressed that product return and recovery practices are undertaken to meet customers' expectations. Without a doubt, customers are becoming more aware of the importance of proper product disposal, and they are sometimes willing to buy recycled products. For instance, in response to consumers' concerns about wastefulness, Kodak and FujiFilm launched a take back program that recycles more than 90 per cent of the used cameras that were returned, thus reversing this product's poor environmental image. Moreover, Canning (2006) found that consumer awareness and participation is crucial to improve recovery and reuse/recycling of end-of-life equipment in the mobile phone industry in the United Kingdom. Meanwhile, Li and Olorunniwo (2008) found that reverse logistics is heavily demand-driven, as customers are the ultimate decision-makers in regard to product returns. Mollenkopf *et al.* (2011) stressed that consumers around the world have become increasingly focused on environmental sustainability, potentially driving dramatic growth in returns management.

On the other hand, some researchers have demonstrated that suppliers affect product return practices and recovery practices. For instance, Toffel (2004) reported that Hewlett-Packard invested in a recycling infrastructure for end-of-life computing equipment. In addition, IBM Europe and Xerox have initiated more product recovery activities to strengthen their product return and recovery operations. Moreover, India is the second-largest market for Nokia, there is a survey found that only 17 per cent of Indian consumers are aware of phone recycling practices. Accordingly, to facilitate recycling, special bins have been placed in retail stores, and personnel have been trained to inform customers about recycling their handsets. Consequently, India collected approximately 68,000 pieces of equipment in 45 days. Therefore, approximately 65 to 80 per cent of all Nokia devices can be recycled (Nidumolu *et al.*, 2009). Huang *et al.* (2015) highlight the Haier Group's construction of the Haier recycling center in Qingdao in 2007. This facility can process product returns as well as the recovery of about 200,000 used home appliances per year, including television sets, air conditioners and washing machines. The construction of this recycling center has encouraged other retailers to implement their own product return and recovery practices.

Rogers and Tibben-Lembke (2001) found that competitive considerations are the most important drivers for the implementation of return practices by enterprises. In fact, the actions of competitors may directly influence a firm's

environmental practices (Carter and Ellram, 1998). Moreover, firms seek to gain legitimacy by imitating successful competitors, particularly when faced with high uncertainty (DiMaggio and Powell, 1983). Additionally, Jennings and Zandbergen (1995) have argued that many managers are uncertain about how to respond to environmental issues. Therefore, Bansal and Roth (2000) have demonstrated that the ways that some firms imitate competitors' environmental practices are unsurprising. In fact, the actions of competitors actually motivate firms to implement product return practices and product recovery practices (Carter and Ellram, 1998; Mollenkopf *et al.*, 2007; Srivastava and Srivastava, 2006). Others have stressed the ways that management inattention (Krikke *et al.*, 2004; Rogers and Tibben-Lembke, 2001) or lack of interest (Álvarez-Gil *et al.*, 2007) act as barriers to product return/recovery. Thus, based on the above discussion, this study proposes the following hypothesis:

H3. The receptivity of managers to pressures from market actors is positively correlated with a firm's implementation of product returns practices.

H4. The receptivity of managers to pressures from market actors is positively correlated with a firm's implementation of product recovery practices.

2.4 Commitment of resources as a moderating variable

To elucidate how resources influence product return/recovery practices, this study draws on resource-based theory to investigate the relationship between resources and returns management. Wernerfelt (1984) introduced the RBV of the firm, which was further refined by Barney (1991). The RBV of a firm regards the firm as a bundle of resources that are valuable, rare, imperfectly imitable and substitutable, which thus constitute the main source of the firm's competitive advantage (Barney, 1991). In addition, Grant (1991) argued that while resources, such as capital equipment, finance, individual employees' skills, patents, brand names and finance, are actually input into the production process of a firm, organizational capabilities are based on the capacities of the teams that perform certain tasks or activities. Toffel (2004) argued that RBV can provide an insight to explain some of the diversity of product recovery among firms.

With respect to resources, and consistent with the RBV of a firm, Daugherty *et al.* (2005) emphasized the importance of commitment of resources to the development of returns and reverse logistics-related capabilities. In fact, Li and Olorunniwo (2008) argued that "commitments in terms of leadership support, financial and personnel resources as well as investment in technological innovation in reverse logistics are important to the success of a firm" (p. 384). Moreover, the components of committed resources include financial, technical and managerial resources (Richey *et al.*, 2004). Furthermore, financial resources, by definition, are necessary to fund strategic processes, such as product returns/recovery practices. Additionally, Lau and Wang (2009) argued that inadequate, outdated or underdeveloped recycling technologies may also act as a barrier to widespread reverse logistics implementation. Jack *et al.* (2010) noted that the technical resources of an organization must be properly

deployed to generate returns and reverse logistics capabilities. Additionally, managerial resources, which include the training, skills and experience of employees as well as their knowledge of product return/recovery practices, is also essential. In sum, all of these resources are required to effectively implement returns management. Therefore, this study proposes the construct of resources commitment as a moderator in the relationship between institutional pressures and the implementation of returns management.

2.4.1 Receptivity of managers to pressures from non-market and market actors, commitment of resources and product return practices
Product return practices are a complex process, as they include returns avoidance, receiving and processing. However, some organizational internal resources may help companies to implement product return practices. With respect to financial resources, enterprises need to invest in certain facilities. For example, Estee Lauder Companies, Inc., invested US\$ 1.3 million in scanners, business intelligence tools and a data warehouse to increase the efficiency and effectiveness of product return practices (Stock *et al.*, 2006). With regard to technical resources, to implement returns avoidance, Toffel (2004) reported that Hewlett-Packard has focused on improving their products' ease of use and developing new company policies that focus on avoiding product returns. Additionally, Blackburn *et al.* (2004) suggested that simple and inexpensive technology must be used to diagnose a product's condition extensively at the point of collection (or even before the product is returned by the customer). Krikke *et al.* (2004) argued that advances in information technology, such as point of sale (POS) registration, two-dimensional (2D) barcoding, electronic marketplaces and radio frequency identification (RFID), which support tracking and tracing of returned products, has great potential for facilitating collection. With reference to managerial resources, a lack of managerial attention very commonly produces "quick and dirty" solutions, leading to inefficient, non-responsive and sometimes even environmentally unsafe activities (Rogers and Tibben-Lembke, 2001). Huang *et al.* (2012) emphasized that the implementation of product return systems and processes depends on the skills, experience, knowledge and intelligence of the employees in a firm.

Although we could not find any research in which commitment of resources moderates the relationship between institutional pressures and product return practices, one study did suggest that managers' attitudes may affect the implementation of product return practices (Padmanabhan and Png, 1995). In addition, Mollenkopf *et al.* (2007) stressed that the effects of external factors on returns management can be strengthened by internal integration between marketing and logistics. For instance, in response to the WEEE Directive, IBM developed the IBM Sterling RL system, which effectively tracks items throughout the return-and-repair process. This system also automates the procedure that returns items to stock and automatically reclassifies the item as refurbished (Huang *et al.*, 2015). Thus, this study will also investigate the relationship between institutional pressure and product return practices in the context of commitment of resources. As a result, we propose the following hypotheses:

H5. The positive relationship between the receptivity of managers to pressures from non-market actors and the implementation of product return practices is stronger when firms commit more resources.

H6. The positive relationship between the receptivity of managers to pressures from market actors and the implementation of product return practices is stronger when firms commit more resources.

2.4.2 Receptivity of managers to pressures from non-market and market actors, commitment of resources and product recovery practices
Product recovery practices are also a complex process, as they include inspecting, repairing, refurbishing and remanufacturing. Therefore, several internal resources within an organization may assist companies to efficiently implement product recovery practices. With regard to financial resources, firms must make large investments in specialized recycling equipment and facilities (Fleischmann, 2001). Additionally, Rogers and Tibben-Lembke (2001) argued that implementing new systems and processes requires investments and the deployment of financial resources. Furthermore, in terms of technical resources, Gobbi (2008) suggested the need for improved technologies to design more environmentally friendly products, which could be easily handled in the recovery processes (for disassembly, remanufacturing, recycling, etc.). Additionally, Krikke *et al.* (2004) stressed that information technology can be used to monitor the recovery of many products and generate useful data. With regard to managerial resources, personnel may be trained to determine whether items should be discarded, repackaged, repaired, refurbished, remanufactured or undergo one of a myriad of other possible processes. Moreover, training methods for personnel should include manuals on operating procedures, the mentoring of workers by more experienced employees and more informal methods (Stock *et al.*, 2006; Stock and Mulki, 2009).

Although research that focuses on the commitment of resources, as a moderating variable in the relationship between institutional pressures and product recovery practices is lacking, some environmental studies provide relevant information. For example, Fineman and Clarke (1996) found that the superior resources of a firm enable it to adapt more quickly and efficiently to regulations, thus gaining competitive advantages. Although Clemens and Douglas (2006) proposed that superior firm resources can negatively moderate the relationship between external coercion and the green initiatives of a firm, Prahinski and Kocabasoglu (2006) stressed that resource investment is essential to the success of product recovery practices. Krikke *et al.* (2004) argued that product data management (PDM) not only yields accurate data on complex products (with many parts, variants and alternatives) but also records maintenance-related changes to a product during its lifecycle, while disseminating product data both intra- and inter-organizationally. This study will also consider the relationship between institutional pressure and product recovery practices in the context of commitment of resources. Therefore, this study proposes the following hypotheses:

H7. The positive relationship between the receptivity of managers to pressures from non-market actors and the implementation of product recovery practices is stronger when firms commit more resources.

H8. The positive relationship between the receptivity of managers to pressures from market actors and the implementation of product recovery practices is stronger when firms commit more resources.

3. Methodology

This section describes the research model, sampling and data collection, measure development, data characteristics and descriptive statistics analysis.

3.1 Research model

This study applies both institutional theory and the RBV to construct a comprehensive research model. Figure 1 displays the research framework that is utilized herein to elucidate the above-mentioned hypotheses. Institutional pressures are separated into non-market pressures and market pressures (Delmas and Toffel, 2008). Returns management is split into product return practices and product recovery practices (Blackburn *et al.*, 2004; Gobbi, 2008; Guide and Van Vassenhove, 2002; Mollenkopf *et al.*, 2011; Prahinski and Kocabasoglu, 2006; Thierry *et al.*, 1995). The basic model is used to investigate the direct effects of the two dimensions of institutional pressures (non-market actors and market actors) on returns management (product return practices and product recovery practices), and serves as the basis of the first four hypotheses (*H1* through *H4*). The model is extended by adding the commitment of resources as moderating variable to explore the relationships among institutional pressures, commitment of resources and returns management, which are specified in *H5* to *H8*. Additionally, this study considers ISO 14,001 certification, industrial categories, and the age and size of firms as the control variables.

3.2 Sampling and data collection

All of the survey items in this study were taken from earlier research. However, most of these items required modification or translation to be utilized in the context of this study. In-depth interviews were conducted with seven business managers who are involved in returns and reverse logistics activities. Their responses, along with a comprehensive literature review, helped in the development of a survey

Figure 1 Research framework for this study

instrument. The survey instruments were subsequently pretested using 30 samples from the 3C sectors (retail and maintenance of computers, communications and consumer electronics). The comments and suggestions of the respondents were used to clarify and improve the readability of the questionnaire.

The 3C Retailer and Maintenance Association provided a list of 900 member companies and agreed to endorse this research in a letter that was mailed with the survey. The questionnaire was mailed to the marketing or logistics manager of each company on the assumption that this person would have knowledge of the returns management of the company. If the receiver did not feel qualified to provide the necessary information, he or she was asked to pass the questionnaire on to the most suitable person. Respondents were asked to indicate one of three categories of their industry (computer, communication and consumer electronics) and to indicate their job title from a list of job titles (corporate director, manager or supervisor). Twenty-five questionnaires were undelivered or returned. A total of 450 usable responses were received, representing a 51.4 per cent valid response rate, based on the initial sample of 875 member companies, which is higher than the response rates in other recent survey-based reverse logistics and green management (Clemens and Douglas, 2006; Jack *et al.*, 2010; Stock and Mulki, 2009; Wu *et al.*, 2012; Ye *et al.*, 2013).

The 450 respondent companies had a range of sizes. Company sales ranged from US$1.39 to US$40.66 million per year, with a mean value of US$5.93 million (based on the exchange rate on January 31, 2015). The number of full-time employees ranged from 8 to 476, while the mean number of employees was 115. The respondents were also asked to indicate how many full-time employees worked in their returns and reverse logistics departments, and the answers ranged from 1 to 60, with an average of 6. Table I presents the profiles of the respondents.

3.3 Measure development

As shown in this study, three constructs are primary interest herein: returns management, institutional pressures and commitment of resources.

3.3.1 Returns management

To obtain valid measures, the term "returns management" had to have the same meaning to all respondents. Thus, the questionnaire commenced by presenting a definition of returns management. In the present investigation, returns management includes the five steps of returns avoidance, receiving, processing, sorting and disposition (Mollenkopf *et al.*, 2011; Rogers *et al.*, 2002; Stock and Mulki, 2009). Returns management is also divided into product return practices and product recovery practices. Product return practices involve returns avoidance as well as the receiving and processing of used or defective products from consumption to the point of origin for the purpose of remanufacturing, reuse or destruction. Product recovery practices involve the recovery of value from used or defective products by repairing, reconditioning, remanufacturing and/or recycling.

Respondents were asked to indicate the extent of their firm's implementation of returns management in reference to six items, which are presented in Appendix 1. These items were

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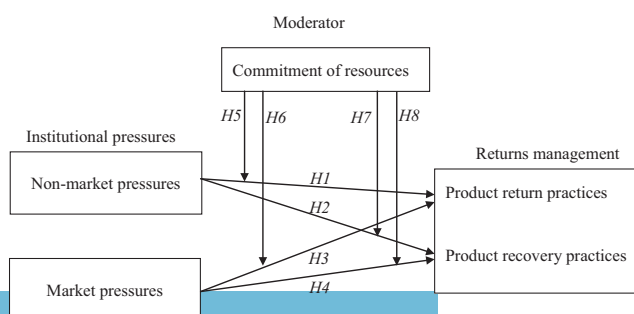
Table I The profiles of respondents

Demographic statistics	Respondents	
	Nos.	(%)
ISO 140,001 Certification		
Yes	283	62.9
No	167	37.1
Industry categories		
Computer	140	31.1
Communication	165	36.7
Consumer Electronics	145	32.2
Size of firms (Number of employee)		
Under 200	240	53.3
201-300	120	26.7
Over 300	90	20.0
Age of firms		
Under 5	113	25.1
5-10	123	27.3
11-20	104	23.1
21-30	59	13.1
Over 30	51	11.4
Location		
North TW	170	37.8
Mid. TW	87	19.3
South TW	128	28.4
East TW	65	14.5

Notes: $N = 450$; TW stands for Taiwan; age was calculated as the difference between 2014 and the founding year of the organization

scored on a seven-point Likert scale where $1 =$ not at all and $7 =$ extensive. An exploratory principal components factor analysis was performed to detect the underlying structure of the relationships among these items. The underlying variables were loaded onto two factors: the first was product return practices and the second was product recovery practices. The two resulting factors had eigenvalues of 2.67 and 1.89 and explained 77.8 per cent of the total variance.

3.3.2 Institutional pressures
H1 to *H4* predict the extent to which managers are receptive to pressures imposed by non-market and market actors. To test these hypotheses, survey respondents were asked to indicate the extent to which various external groups affected their companies in the area of returns management. The list of external groups included customers, suppliers, competitors, local communities, environmental organizations, regulators/ legislators and the media. This list corresponds to external stakeholders that have been identified in the corporate environmental strategy literature (Delmas and Toffel, 2008), as indicated in Appendix 1. Respondents ranked each group on a seven-point scale from "no influence" (coded 1) to "very strong influence" (coded 7). An exploratory principal components factor analysis was carried out to detect the underlying structure in relationships among these variables. The underlying variables loaded onto two factors, the first of which represents receptivity to market pressures exerted by customers, suppliers and competitors, while the second represents receptivity to non-market pressures exerted by local communities, environmental organizations, regulators and the media. These two factors had eigenvalues of 3.45 and 1.29 and explained 67.6 per cent of the total variance.

3.3.3 Commitments of resources
Following Richey *et al.* (2004), the commitment of resources is divided into three parts: technological resources, managerial resources and financial resources. The commitment of technological resources involves certain specific technologies that are developed for returns management, including POS registration, 2D barcoding, electronic marketplaces, RFID and PDM, as well as technologies that are used in the design of environmentally friendly products. The commitment of managerial resources refers to the level of managerial commitment to returns management, including relevant training, skills and experience of the employees, as well as their knowledge of product return/recovery practices. The commitment of financial resources is measured as the money allocated to returns management. Respondents were asked to indicate the levels of resources that are committed to returns management in their company, as described in Appendix 1. Responses were given using a seven-point Likert scale where $1 =$ not at all and $7 =$ extensive.

3.3.4 Control variables
Industrial categories, ISO 14,001 certification, and the age and size of firm*s* were considered as control variables. The industrial categories were specified by introducing two binary variables that identified the computer, communication and consumer electronics sectors, respectively. These variables were included to control for variations among industries in terms of environmental pressures, potential environmental damage and perceptions of environmental issues (Gonzalez-Benito and Gonzalez-Benito, 2006). The 14,001 certification, which involved environmental management systems, was finally defined in October 1996, and thereafter rolled out globally. To measure whether the surveyed firms had adopted ISO 14,001, the date of certification was given. If a firm had ISO 14,001 certified, then it was coded 1 for the year of certification and 0 otherwise (Delmas and Toffel, 2008). Age was calculated as the difference between 2014 and the founding year of the organization. As an organization grows older, organizational inertia may inhibit organizational efforts to respond to environmental issues (Egri and Herman, 2000). This study controlled for the size of firms because large organizations are more likely to take an active role in natural environmental management (Delmas and Toffel, 2008). Following Child (1972), the size of the firm was taken as the log value of the number of employees.

3.4 Data characteristics
3.4.1 Common method bias and non-response bias
The non-response bias of the survey was evaluated using an extrapolation method (Larson and Poist, 2004), which compares first- and second-wave responses across a selection of items in the questionnaire. Some works have used this method and *t*-tests to compare demographic variables between responses in the first and the second waves (Boon-itt and Wong, 2011; Jack *et al.*, 2010). In this study, *t*-tests were conducted to compare all study variables and demographic

variables between the two waves. The t-test results revealed no significant difference ($p > 0.05$) between first- and second-wave respondents in any of the study variables, suggesting that the non-response bias was not an issue. Because two antecedent variables were measured using items in a questionnaire completed by a single respondent, the Harman one-factor test was conducted to assess whether common method variance was a serious issue (Podsakoff and Organ, 1986). The results show no single dominant factor accounts for most of the variation among the self-reported variables, so common method variance is unlikely to be a serious problem in the data.

3.4.2 Reliability and validity

In this study, construct reliability was assessed by calculating Cronbach's alpha coefficients for product return practices, product recovery practices, receptivity to non-market pressures, receptivity to market pressures and commitment of resources. Generally, a construct with loading of items of over 0.5, or a significant t-value ($t > 2.0$), or both, is regarded as exhibiting convergent validity (Fornell and Larcker, 1981). In the proposed model, all factor loadings exceed 0.5 and all t-values are greater than 2.0. Table II presents the results concerning the five major constructs. The alpha coefficient for product return practices was 0.76, for product recovery practices was 0.77, for receptivity to non-market pressures was 0.82, for receptivity to market pressures was 0.81 and for commitment to resources was 0.79. All five constructs had Cronbach's alpha coefficients that exceeded 0.70 and so were

considered to be reliable (Nunnally and Bernstein, 1994). Composite reliability and average variance extracted (AVE) were used to assess the internal consistency of each latent construct (Fornell and Larcker, 1981). The composite reliability of each latent variable exceeded the threshold value of 0.70 (Nunnally and Bernstein, 1994), and each AVE exceeded the threshold value of 0.50 (Fornell and Larcker, 1981).

Discriminant validity was evaluated by comparing the correlations between a given construct and all other constructs with the AVE for the focal construct (Hair *et al.*, 2006). Table III presents the correlation matrix for the constructs, and the diagonal elements have been replaced by the square root of the AVE. The constructs exhibit adequate discriminant validity because these diagonal elements were greater than the off-diagonal elements in the corresponding rows and columns.

3.4.3 Descriptive statistics analysis

Table III also reveals the means, standard deviations and bivariate correlations of the variables. The mean value (3.824) of product recovery practices is somewhat low, indicating that product recovery practices in 3C retail and maintenance stores in Taiwan must be improved. The results show that receptivity to non-market pressures, receptivity to market pressures and the commitment of resources are all positively and significantly correlated with product returns practices. The data also indicate that receptivity to non-market pressures, receptivity to market pressures and commitment of resources

Table II Confirmatory factor analysis

Construct	Measure items	Factor loading	t value	Composite reliability	AVE	Cronbach's alpha
Product return practices	R1	0.59	10.62	0.84	0.68	0.76
	R2	0.76	14.70			
	R3	0.57	10.08			
Product recovery practices	R4	0.50	8.93	0.85	0.67	0.77
	R5	0.75	14.40			
	R6	0.68	1.32			
Receptivity to non-market pressures	P1	0.72	14.04	0.86	0.69	0.81
	P2	0.78	15.84			
	P3	0.74	14.74			
	P4	0.68	12.98			
Receptivity to market pressures	P5	0.77	15.67	0.87	0.75	0.80
	P6	0.78	15.75			
	P7	0.76	15.24			
Commitment of resources	RC1	0.74	13.10	0.88	0.78	0.79
	RC2	0.67	11.94			
	RC3	0.82	14.77			

Table III Descriptive statistics and correlations

Construct	Mean	SD	(1)	(2)	(3)	(4)	(5)
Product return practices	4.575	1.120	0.825				
Product recovery practices	3.824	1.270	0.800[a]	0.819			
Receptivity to non-market pressures	4.954	0.827	0.609[a]	0.615[a]	0.831		
Receptivity to market pressures	4.942	0.724	0.565[a]	0.560[a]	0.606[a]	0.866	
Commitment of resources	4.770	0.928	0.654[a]	0.642[a]	0.517[a]	0.450[a]	0.883

Notes: 450 observations; [a] $p < 0.01$; SD = Standard deviation, the values in the diagonal line are the square root of the AVE

are all significantly correlated with product recovery practices in the expected positive directions.

4. Results

4.1 Effect of institutional pressure on returns management

Table IV presents maximum-likelihood estimates fixed-effects regression analysis of product return practices and product recovery practices.

H1 proposes that the receptivity of managers to pressures from non-market actors is positively correlated with a firm's implementation of product return practices. In this study, ISO 14,001 certification, industry categories, age of a firm and size of a firm are taken as control variables. As indicated in Model 1 in Table IV, the coefficients between these control variables and product return practices are insignificant. As exhibited in Model 1 in Table IV, the relationship between the receptivity of managers to non-market pressures and product return practices ($\beta = 0.414$, $p < 0.01$) is significant and positive, thus supporting H1.

H2 suggests that the receptivity of managers to pressures from non-market actors is positively correlated with a firm's implementation of product recovery practices. In this study, ISO 14,001 certification, industry categories, age of a firm and size of a firm were used as control variables. As shown in Model 2 in Table IV, the coefficients of correlation of these control variables with product recovery are insignificant. Additionally, the relationship between the receptivity of managers to non-market pressures and product recovery practices ($\beta = 0.426$, $p < 0.01$) is significant and positive. Hence H2 is supported.

H3 posits that the receptivity of managers to pressures from market actors is positively correlated with a firm's implementation of product return practices. As indicated in Model 1 in Table IV, the relationship between the receptivity of managers to market pressures and product return practices ($\beta = 0.316$, $p < 0.01$) is significant and positive, supporting H3.

H4 states that the receptivity of managers to pressures from market actors is positively correlated with a firm's implementation of product recovery practices. As presented in Model 2 in Table IV, the relationship between the receptivity of managers to market pressures and product recovery

practices ($\beta = 0.301$, $p < 0.01$) is significant and positive. Therefore, H4 is supported.

4.2 Moderating effects of commitment of resources

To test H5 to H8, moderated regression analyses were performed. Following Aiken and West (1991) and Jaccard and Turrisi (2003), this investigation centered ($x = 0$) two dimensions of institutional pressures in performing the moderated regression analyses to minimize the effects of multicollinearity among variables that comprise the interaction terms. The analysis that was discussed in the preceding section tests all possible relationships in the conceptual model ($Y = b0 + b1X1 + b2X2$). The methodology from Baron and Kenny (1986) was used to retest each equation, incorporating moderator variables ($Y = b0 + b1X + b2X2 + b3Z$). Accordingly, changes in R^2 and significant interaction correlations were evaluated to identify any significant increase in the interaction, which would indicate the effect of a moderating variable.

H5 posits that the relationship between the receptivity of managers to pressures from non-market actors and the implementation of product return practices is stronger when firms commit more resources. The Model 1 in Table IV is used as a base model. Model 3 in Table V adds the commitment of resources into the regression model, causing a significant change in the R_{Adjusted}^2 ($\triangle R_{\text{Adjusted}}^2 = 0.124$, $p < 0.01$), indicating an increase in the predictive power of the regression model. Based on Model 4 in Table V, the moderating effect of the commitment of resources is evaluated by incorporating the interactions between the commitment of resources and non-market pressures to the regression. The results reveal that the commitment of resources positively and significantly ($p < 0.01$) moderates the relationship between the receptivity of managers to non-market pressures and the implementation of product return practices. To further explain the commitment of resources as a moderating variable, simple regression slopes (Cohen et al., 2003) were plotted and Figure 2 shows the relevant interaction. In Figure 2, the slope of the main relationship becomes more positive, as more resources are committed. Specifically, the solid line (which exhibits the relationship between the receptivity of managers to pressures imposed by non-market actors and the implementation of product return practices when the commitment of resources is high) is more steeply positive than

Table IV Regression analysis (standardized regression coefficients)

| Variable	Product return practices Model 1		Product recovery practices Model 2	
	Bata	p	Bata	p
Gain ISO 14,001 certification	0.052	0.250	0.062	0.176
Industry categories	0.092	0.211	0.093	0.204
Age of firm	−0.034	0.566	−0.075	0.204
Size of firm	−0.094	0.175	−0.076	0.269
Receptivity to non-market pressures (X_1)	0.414	0.000	0.426	0.000
Receptivity to market pressures (X_2)	0.316	0.000	0.301	0.000
R_{Adjusted}^2	0.427		0.431	
F significance	0.000		0.000	

Note: $n = 450$

Table V Hierarchical regression analysis (standardized regression coefficients)

| Variable | Product return practices | | | |
	Model 3		Model 4	
	Bata	p	Bata	p
ISO 14,001 certification	0.020	0.626	0.023	0.562
Industry categories	0.030	0.649	0.035	0.577
Age of firm	0.047	0.375	0.019	0.717
Size of firm	−0.081	0.187	−0.064	0.278
Receptivity to non-market pressures (X_1)	0.256	0.000	0.227	0.000
Receptivity to market pressures (X_2)	0.221	0.000	0.210	0.000
Commitment of resources (Z)	0.425	0.000	0.497	0.000
Receptivity to non-market pressures* Commitment of resources			0.100	0.040
Receptivity to market pressures* Commitment of resources			0.129	0.006
$R_{Adjusted}^2$	0.551		0.584	
Change in $R_{Adjusted}^2$	0.124		0.033	
Significant F change	0.000		0.000	

Note: $n = 450$

Figure 2 Resources commitment as a moderator of the relationship between non-market pressures and product returns
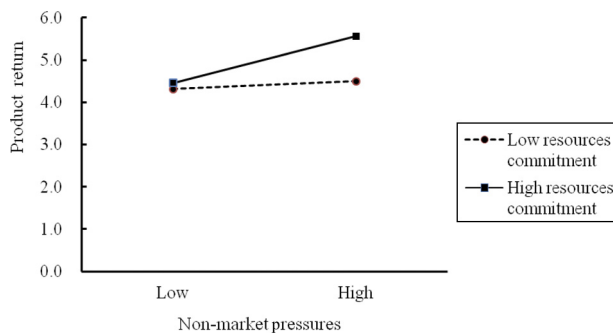
the dashed line (which displays the relationship between the receptivity of managers to pressures imposed by non-market actors and the implementation of product return practices when the commitment of resources is low). This finding supports *H5*.

H6 proposes that the relationship between the receptivity of managers to pressures exerted by market actors and the implementation of product return practices is stronger when firms commit more resources. Model 1 in Table IV is utilized as a baseline model. Model 3 in Table V adds the commitment of resources to the regression model, significantly changing the $R_{Adjusted}^2$ ($\triangle R_{Adjusted}^2 = 0.124$, $p < 0.01$), indicating an increase in the predictive power of the regression model. Model 4 in Table V indicates that the interaction term has a positive and significant effect on product return practices ($p < 0.01$), and Figure 3 plots the simple regression slopes. This result reveals that the positive relationship between the receptivity of managers to pressures exerted by market actors and the implementation of product return practices is stronger when firms commit more resources. In contrast, when firms commit fewer resources, the receptivity of managers to market pressures was found to be largely unrelated to the implementation of product return practices. Therefore, this finding supports *H6*.

H7 predicts that a stronger relationship exists between the receptivity of managers to pressures from non-market actors

and the implementation of product recovery practices when firms commit more resources. Model 2 in Table IV is applied as the baseline model. Model 5 in Table VI adds commitment of resources into the regression, significantly changing the $R_{Adjusted}^2$ ($\triangle R_{Adjusted}^2 = 0.109$, $p < 0.01$) and increasing the predictive power of the regression model. According to Model 6 in Table VI, the interaction term is positive and significant ($p < 0.01$). Figure 4 plots the relevant interaction. In Figure 4, the slope of the main relationship becomes more positive with the commitment of more resources. Specifically, the solid line (which indicates the relationship between the receptivity of managers to non-market pressures and the implementation of product recovery practices when the commitment of resources is high) is more steeply positive than the dashed line (which shows the relationship between the receptivity of managers to non-market pressures and the implementation of product recovery practices when the commitment of resources is low). Hence, the result supports *H7*.

H8 states that a stronger relationship exists between the receptivity of managers to pressures from market actors and the implementation of product recovery practices when firms commit more resources. Model 6 in Table VI presents regression results. Figure 5 plots the relevant interaction. In support of *H8*, when firms commit more resources, the

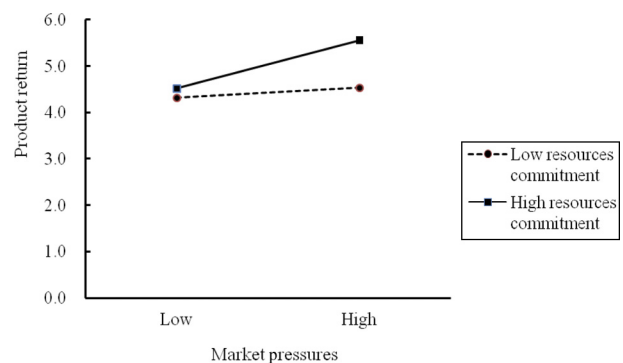**Figure 3** Resources commitment as a moderator of the relationship between market pressures and product return

Table VI Hierarchical regression analysis (standardized regression coefficients)

| | Product recovery practices | | | |
| | Model 5 | | Model 6 | |
Variable	Bata	P	Bata	p
ISO 14,001 certification	0.031	0.453	0.035	0.372
Industry categories	0.035	0.601	0.039	0.536
Age of firm	0.001	0.981	−0.023	0.651
Size of firm	−0.064	0.303	−0.046	0.439
Receptivity to non-market pressures (X_1)	0.278	0.000	0.263	0.000
Receptivity to market pressures (X_2)	0.212	0.000	0.180	0.001
Commitment of resources (Z)	0.400	0.000	0.484	0.000
Receptivity to non-market pressures* Commitment of resources			0.148	0.003
Receptivity to market pressures* Commitment of resources			0.104	0.028
$R_{Adjusted}^2$	0.540		0.580	
Change in $R_{Adjusted}^2$	0.109		0.040	
Significant *F* change	0.000		0.000	

Note: $n = 450$

Figure 4 Resources commitment as a moderator of the relationship between non-market pressures and product recovery
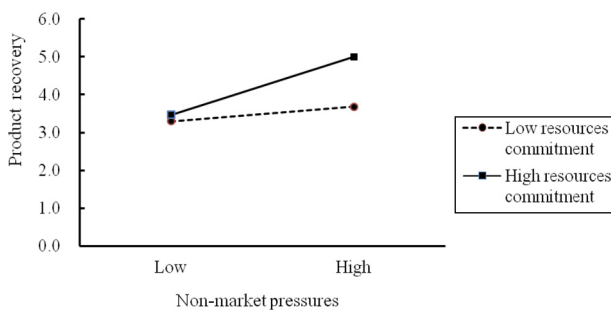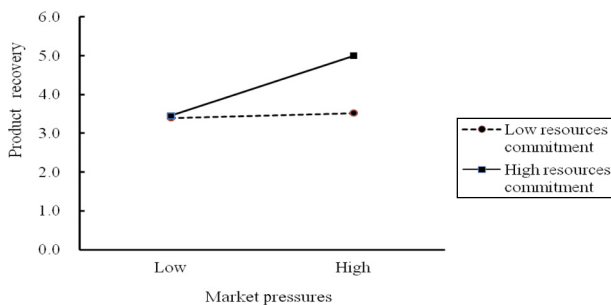

Figure 5 Resources commitment as a moderator of the relationship between market pressures and product recovery

relationship between the receptivity of managers to pressures imposed by market actors and the implementation of product recovery practices is strengthened. In contrast, when firms commit fewer resources, the receptivity of managers to pressures exerted by market actors was largely unrelated to the implementation of product recovery practices.

5. Conclusions and implications

5.1 Findings
This study involves critical concepts from two important schools of thought: institutional theory and the RBV, which are seldom combined, to explore the issue of returns management. First, returns management is divided into two dimensions: product return practices and product recovery practices. Second, institutional pressures are split into non-market and market pressures to investigate how institutional pressures drive firms to implement product return practices and product recovery practices. Third, institutional theory is linked to the RBV, where the commitment of resources is utilized as a moderating variable to enhance our understanding of the relationship among institutional pressures, commitment of resources and product return/recovery practices. Finally, a survey of 450 Taiwanese retail and maintenance stores in the 3C sectors (computers, communication and consumer electronics) was carried out.

5.1.1 Drivers of returns management
This study presents some interesting findings. With respect to institutional pressures, significant and positive relationships exist between non-market pressures and both the implementation of product return practices and product recovery practices, supporting *H1* and *H2*. Obviously, the results of this study imply that local communities, environmental organizations, media and government/regulators will motivate firms to implement product return/recovery. The results of this investigation are similar to previous studies. For example, some studies have found that government/legislators potentially affect product return practices (Knemeyer *et al.*, 2002; Mollenkopf *et al.*, 2007; Rogers *et al.*, 2002). Additionally, the effect of environmental regulation in the retail market, such as the WEEE and RoHS Directives, stimulates firms to perform returns management (Mollenkopf *et al.*, 2011). Gobbi (2008) argued that the pressure of external stakeholders, including society, industrial associations, environmental organizations and media, can push companies to implement product return/recovery practices.

The findings of this study also reveal that market pressures significantly and positively affect the implementation of product return practices and product recovery practices, supporting *H3* and *H4*. Basically, we show that competitors, customers and suppliers will stimulate firms to carry out

product return/recovery practices. This result echoes previous studies, as some scholars (Gonzalez-Benito and Gonzalez-Benito, 2006; Li and Olorunniwo, 2008; Srivastava and Srivastava, 2006) have stressed that customer pressures affect the implementation of returns management. Additionally, the actions of competitors motivate firms to implement returns management (Carter and Ellram, 1998; Rogers and Tibben-lembke, 2001; Srivastava and Srivastava, 2006). Huang et al. (2015) have stated that the offering of an easy recycling program by suppliers will encourage retailers to implement reverse logistics.

In addition, this study found that the influence of non-market pressures on product return/recovery practices is higher than the influence of market pressures, as shown in Models 1 and 2 in Table IV. The findings indicate that the receptivity of managers to pressures imposed by non-market actors is greater than the receptivity of managers to pressures imposed by the market actors. This finding is consistent with numerous studies, which have stressed that regulatory sectors exert the greatest pressure on returns management (Mollenkopf et al., 2007; Rogers et al., 2002). Overall, institutional pressures exerted by non-market and market actors may play major roles to strongly compel firms to perform product return/recovery practices. These findings will encourage managers to implement returns management, including product return/recovery practices, to satisfy the claims of non-market and market actors as the way of gaining legitimacy.

5.1.2 Moderating effects of commitment of resources
First, the results in this study indicate that the commitment of resources has a positive moderating effect on the relationship between the receptivity of managers to non-market pressures and the implementation of product return practices. In particular, the positive effects of non-market pressures on product return practices will be enhanced if firms increase the amount of resources committed. Hence, the result supports H5. Second, this study revealed that the commitment of resources has a positive moderating effect on the relationship between managers' receptivity to market pressures and implementation of product return practices. Accordingly, the positive effects of market pressures on product return practices are heightened when enterprises commit more resources. Therefore, H6 is supported.

These findings highlight the fact that it makes sense for corporations to commit resources to ensure efficient product return performance, as firms often face various pressures from different actors. For example, in response to WEEE directives and customer demands, Estee Lauder Company invested in 2D barcoding scanners, business intelligence tools and a data warehouse (Stock et al., 2006). Additionally, IBM developed the IBM Sterling RL (Huang et al., 2015) to improve the efficiency and effectiveness of product return practices. These findings echo Rogers and Tibben-Lembke (2001), who found that firms needed to commit more resources to improve the efficiency of product returns. They also discovered that the main obstacles to reverse logistics included a lack of information systems, management inattention, lack of personnel resources and lack of financial resources. Huang et al. (2012) also emphasized that enterprises need the skills, experience, knowledge and intelligence of employees to

implement product return systems and processes. These findings support the fact that when firms face pressure from non-market and market actors, they should commit more resources, including financial resources (Stock et al., 2006), technical resources (Blackburn et al., 2004; Krikke et al., 2004) and managerial resources (Huang et al., 2012; Mollenkopf et al., 2007), in turn, to allow for more efficient and effective implementation of product return practices.

Third, this study also found that when firms commit more resources, a stronger relationship is evident between the receptivity of managers to non-market pressures and the implementation of product recovery practices. The finding supports H7. Fourth, this study also found that the relationship between the receptivity of managers to market pressures and the implementation of product recovery practices is stronger when firms commit more resources, thus H8 is supported. These findings echo previous studies, which noted that firms should provide more resources, including financial resources (Fleischmann, 2001; Rogers and Tibben-Lembke, 2001), technical resources (Gobbi, 2008; Krikke et al., 2004) and managerial resources (Stock et al., 2006; Stock and Mulki, 2009) to improve product recovery practices when enterprises encounter more pressures imposed by regulation and customers. Prahinski and Kocabasoglu (2006) also emphasized the importance of a firm's provision of facilities to the successful implementation of product recovery practices. Krikke et al. (2004) stated that PDM provides the required data that helps firms to recover products effectively. These findings also support Gonzalez-Torre et al. (2010), who indicated that firms performing environmentally oriented reverse logistics must overcome internal organizational limitations, such as a lack of support from top management. Therefore, the results of this study show that it is important for firms to commit more resources to ensure that product recovery practices are successfully implemented, even though firms often suffer from pressures from various actors.

Few studies have investigated how the commitment of resources may moderate the relationship between institutional pressures (non-market and market pressures) and returns management (product return/recovery practices). From the environmental literature, the present study opposes Clemens and Douglas (2006), who found that superior firm resources can negatively moderate the relationship between external coercion and green initiatives. One possible explanation is that firms that commit more resources to returns management (product return/recovery practices) may be better equipped to fight institutional pressures (non-market and market pressures). This study provides a better understanding of how managers may efficiently and effectively manage resources for product return practices and product recovery practices when firms face various institutional pressures.

5.2 Theoretical implications
This study provides several contributions to the existing literature on returns management. First, prior research has treated returns management as one-dimensional (Mollenkopf et al., 2011; Rogers et al., 2002; Stock and Mulki, 2009), but this study divides returns management into both product return practices and product recovery practices. This study also extends the current definition of returns management.

Second, the external business environment is an important factor in understanding how enterprises manage product returns (Mollenkopf *et al.*, 2011) and product recovery (De Brito and Dekker, 2004; Toffel, 2004). Institutional theory not only emphasizes how a firm's behavior is influenced by its external environment but also this theory offers useful insights into the isomorphic behavior of firms in performing product return practices and product recovery practices. Accordingly, this study adopts institutional theory (DiMaggio and Powell, 1983; Jennings and Zandbergen, 1995; Scott, 2014), which has been rarely applied before, to examine institutional pressures that affect the implementation of product return practices and product recovery practices. In this study, through the lens of institutional theory, we offer further insights into why firms engage in product return practices and product recovery practices.

Third, previous research has generally considered two relevant external factors: legislation and customers (Gobbi, 2008; Krikke *et al.*, 2004), whereas the present study utilizes institutional theory but also divides these institutional pressures into non-market (local community, environmental organizations, media and government/regulators) pressures and market (competitors, customers and suppliers) pressures. Thus, this study offers a way to assess the importance of various actors and extends the concept of multiple external drivers. Fourth, this study simultaneously links both institutional theory and the RBV (Clemens and Douglas, 2006; Oliver, 1997) to investigate the external and internal factors that drive the implementation of product return/recovery practices. Hence, this research broadens our understanding of the implementation of returns management and how it is affected by both external (institutional pressures) and internal (such as commitment of resources) factors. Additionally, this study provides a useful framework for firms that want to develop a successful strategy for product returns/recovery practices.

Fifth, this study takes an RBV of the firm to explore issues associated with product returns/recovery practices. Basically, an RBV involves ways that a firm allocates, manages and integrates internal resources and capabilities (Huang *et al.*, 2012; Toffel, 2004). Thus, this study improves our understanding of the fact that, when a firm considers the option of internalizing product returns/recovery practices, the crucial issue is to determine whether it already has a set of resources and capabilities that can ensure the efficiency and effectiveness of performing product returns/recovery practices. Sixth, interaction effects may compensate for the deficiency in terms of the direct drivers of product returns/recovery (Mollenkopf *et al.*, 2007). Our study reinforces the importance of a strong commitment of resources in implementing product returns/recovery. Moreover, the results indicate that committing resources may be a useful mechanism to manage interdependencies between institutional pressures (non-market/market pressures) and product returns/recovery. As such, our study contributes to the literature of returns management by showing that a commitment of resources has a moderating effect between institutional pressures (non-market/market pressures) and returns management (product returns/recovery). In doing so, this research not only contributes to the literature of

institutional theory on returns management but also extends our understanding of the RBV on product returns/recovery practices.

Seventh, as this study concerns the 3Cs (computers, communication and consumer electronics), we found that these industries have obviously changed in the area of recovery management, as they change continuously in their technologies, the shortening of the life cycles of their products and in the reduction of high disposal rates. Therefore, elucidating the mechanisms of product return/recovery practices and the factors that drive firms to undertake product return/recovery practices is important for 3Cs industries. Eighth, most studies of product return/recovery practices are qualitative and involve case studies. In contrast, this study provides empirical results that are based on a large-scale survey, improving upon the limited available evidence related to product return/recovery practices that have been presented in previous research. Finally, this work offers an Asian perspective on product return/recovery practices by extending the existing empirical research. Some manufacturing sectors in Taiwan, and particularly the computer and electronics industries, have become global leaders. For example, computer monitors, printed circuit boards and image scanners that are produced in Taiwan supply 50 per cent of the global market for these products (Huang and Wu, 2010). Investigating the experience of firms in Taiwan in the area of product return/recovery practices is important, as doing so provides an example of effective returns management to other developing Asian countries.

5.3 Practical implications

This study has several practical implications. First, the current investigation reveals that 3C retail and maintenance stores in Taiwan undertake few product recovery practices. This finding is consistent with prior research, as several have found that despite the growing importance of performing product recovery practices to businesses, the effect of return management has been neglected, or at least poorly understood, by many enterprises (Mollenkopf *et al.*, 2011; Stock and Mulki, 2009). Nevertheless, communities, consumers and governments are focusing more and more on environmental sustainability, so the scope of product return/recovery practices may increase dramatically. Accordingly, this research suggests that managers should pay continuous attention to the influence of external factors, such as non-market and market actors, and improve the product return/recovery practices, especially in support of disposition, which includes repacking, repairing, refurbishing or remanufacturing.

Second, from an institutional viewpoint, this study presents findings that demonstrate the particular importance of a firm's awareness of the external environment. To comply with regulations and environmental laws, a firm needs to effectively manage its product return activities (Mollenkopf *et al.*, 2007). In fact, these systems can help a firm satisfy the demands of non-market actors and gain legitimacy, which is emphasized in institutional theory (DiMaggio and Powell, 1983; Jennings and Zandbergen, 1995; Scott, 2014). Third, product return/recovery practices can improve service to customers, who increasingly demand warranties, take backs and repairs. Some

studies have emphasized that effective product return/recovery practices and programs increase revenue, reduce costs, improve profitability and enhance levels of customer service (Daugherty *et al.*, 2005; Mollenkopf *et al.*, 2011; Rogers *et al.*, 2002; Stock *et al.*, 2006; Stock and Mulki, 2009). Consequently, product return/recovery practices are a valuable tool for firms that need to satisfy market actors and should be included by managers in their strategic agendas.

Fourth, to enhance the product return/recovery practices in firms, substantial resources must be committed, as the implementation of product return/recovery practices is resource-intensive (Daugherty *et al.*, 2001; Stock and Mulki, 2009). Therefore, this research suggests that managers should adequately exploit internal factors, such as resources, in product return/recovery practices. Fifth, this study gives managers, who increasingly operate under significant institutional pressures with limited resources, outlines of strategies that may increase the effectiveness of product return/recovery practices while responding to the concerns of non-market/market actors. This study argues that managers, by focusing their efforts on product return/recovery practices, can efficiently manage non-market/market actors and effectively commit resources to product return/recovery practices.

5.4 Managerial implications
This study has some managerial implications. First, most firms include returns avoidance as a part of product returns practices. This finding supports the results of several studies, such as the survey of Rogers *et al.* (2002), who found that approximately 50 per cent of product returns in the consumer electronics sector are not because of product defects, but by difficulties faced by customers in properly operating the product. Therefore, some scholars have argued that the best way to optimize product return practices is returns avoidance (Stock *et al.*, 2006; Stock and Mulki, 2009). Mollenkopf *et al.* (2011) also claimed that returns avoidance strategies can be understood as a means of generating value by the retailer for the consumer. From this perspective, this study suggests that the retailer should adopt returns avoidance to teach customers about the operation of purchased products. Second, product return/recovery practices involve a complex process. Thus, better product return/recovery practices will help companies to retrieve a greater proportion of products that can be refurbished or remanufactured, and a higher percentage of parts or components that can be recovered for resale. Product return/recovery practices are particularly important to 3C retailers because 3C products typically have especially high disposal rates and complex repair, recycle, reuse and resale cycles (Rogers *et al.*, 2002; Stock *et al.*, 2006). Therefore, this study also suggests that managers should continually perform product return/recovery practices and accurately evaluate the return/recovery practices of each product to determine the optimal means of disposition, and thereby realize a competitive advantage through proper returns management.

Third, product return/recovery is composed of five processes, which are returns avoidance, receiving, processing, sortation and disposition. Clearly, these processes require communication among various internal and external departments, customers and vendors. Hence, managers are

encouraged to establish an effective and efficient personal and electronic communications process that facilitates the smooth and rapid transmission of information. Fourth, this study finds that if resources are properly committed to the implementation of product return/recovery practices, they will help to overcome the challenges and pressures exerted by non-market actors (local community, environmental organizations, media and government/regulators) and market actors (competitors, customers and suppliers) that affect the implementation of product return/recovery practices. Generally, as resources can be targeted to achieve improvements, financial, technical and managerial resources may be used in support of product return/recovery practices and their deployment to handle product return/recovery practices more efficiently and effectively, thereby reducing costs.

5.5 Limitations and future research
While the objectives of this study were successfully met, some limitations must be considered. First, this study investigates return management that involves product return/recovery practices. Returns management, which is considered as RSCs, already existed in the real process of SCM. Therefore, future research can broadly integrate both forward and reverse flows into closed-loop supply chains (Krikke *et al.*, 2004; Mollenkopf *et al.*, 2007) to investigate whether reverse flow is part of the forward supply chain and to examine how both forward and reverse flows can be managed and operated efficiently and effectively. Second, this study applied institutional theory to identify the factors that stimulate firms to implement product return/recovery practices. Future research is suggested to use stakeholder theory to evaluate the importance of stakeholder pressure to identify and elucidate the role of stakeholders (Álvarez-Gil *et al.*, 2007) in the returns management of firms. Additionally, the effect of such stakeholder attributes as power, legitimacy and urgency (Agle *et al.*, 1999; Mitchell *et al.*, 1997) on the implementation of product return/recovery practices could also be investigated.

Third, this study integrated institutional theory and the RBV of product return/recovery practices. Future research can consider both institutional theory and internal factors, such as organizational characteristics (Delmas and Toffel, 2008), culture (Hoffman, 2001), managerial strategic posture (Álvarez-Gil *et al.*, 2007) as well as cross-functional integration (Mollenkopf *et al.*, 2011). Fourth, although firms' corporate social responsibility (CSR) practices were not a main focus of this research, returns management, as a part of SCM, may become increasingly critical to the development and performance of CSR practices. Therefore, future research can investigate the relationship between CSR practices and returns management.

Fifth, this study examined only the antecedents of returns management. Future studies may consider the antecedents and consequences of returns management using the paradigm of the resource-capability-competitive relationship for the RBV of the firm (Jack *et al.*, 2010). Finally, this study focused on the 3C sector (computers, communication and consumer electronics), limiting the generalizability of the findings to other industries. In particular, the residual value of a product may be unimportant in other industries that are not so affected

by rapid technological change and the fast loss of product value. Therefore, further research should consider other industries to extend the applicability of the results.

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Further reading

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Appendix 1. Construct measurement

A.1 Returns management

Please indicate the implementing levels of returns management within your company (1 = not at all; 7 = extensive).

R1: Company adopts measures to prevent returns from occurring.

R2: Company accepts product returns from customers.

R3: Our company process returned product effectively.

R4: Company tests, sorts and classifies returned product.

R5: Company repairs, reconditions and remanufactures component parts from returned, defective or damaged products.

R6: Company dismantles unusable returned products to recover renewable and reusable materials.

A.2 Institutional pressures

Please indicate the influencing degree with respect to the following groups to implement returns management within your company (1 = no influence; 7 = very strong influence).

P1: Local communities have the influence on our company to implement returns management.

P2: Environmental organizations have the influence on our company to implement returns management.

P3: Media have the influence on our company to implement returns management.

P4: Government regulations have the influence on our company to implement returns management.

P5: Competitors have the influence on our company to implement returns management.

P6: Customers have the influence on our company to implement returns management.

P7: Suppliers have the influence on our company to implement returns management.

A.3 Commitment of resources:

Please indicate the extent of resources commitment to returns management within your company (1 = not at all; 7 = extensive).

RC1: Company offers technological resources to implement returns management (included POS registration, 2D barcoding, electronic marketplaces, RFID and PDM as well as designing for environmental friendly products).

RC2: Company offers managerial resources to implement returns management (included the training, skills, experience and knowledge of the employees about product return/recovery).

RC3: Company offers financial resources to implement returns management.

About the authors

Yi-Chun Huang is Professor at the Department of Business Administration, National Kaohsiung University of Applied Sciences, Taiwan. His papers have been published in *Management Decision*, *Marketing Intelligence & Planning*, *Journal of Management and Organization*, *Production and Planning Control* and *Management Research Review*. His research interests include reverse logistics, green supply chain management and green innovative strategy. He received his PhD degree in Business Administration from National Sun Yat-Sen University, Taiwan.

Min-Li Yang is Associate Professor at the Department of Business Administration, National Kaohsiung University of Applied Sciences. She received her PhD from Adam Smith Business School, University of Glasgow in UK. Her current research interests include entrepreneurship, marketing management and strategic management. Her works have been published in the *Marketing Intelligence & Planning*, *Management Research Review* and *Journal for SME Development*. Min-Li Yang is the corresponding author and can be contacted at: minly@kuas.edu.tw

Ying-Jiuan Wong is Assistant Professor at the Department of Business Administration, National Kaohsiung University of Applied Sciences. She received her PhD from the Department of Business Administration and Institute of International Business at National Cheng Kung University in Taiwan. Her main research interests are entrepreneurship, family business, corporate governance and corporate finance. Her work has been published in the *British Journal of Management* and *Corporate Governance: An International Review*.

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