A Conceptual Framework of Reverse Logistics Impact on Firm Performance

Abstract

This study aims to examine the reverse logistics factors that impact upon firm performance. We review reverse logistics factors under three research streams: (a) resource-based view of the firm, including: Firm strategy, Operations management, and Customer loyalty (b) relational theory, including: Supply chain efficiency, Supply chain collaboration, and institutional theory, including: Government support and Cultural alignment. We measured firm performance with 5 measures: profitability, cost, innovativeness, perceived competitive advantage, and perceived customer satisfaction. We discuss implications for research, policy and practice.

Keywords: Reverse logistics; firm performance; resource-based view of the firm; relational theory; institutional theory.

1. Introduction

Reverse logistics are not always as mature as forward logistics and this impose significant environmental repercussions as well as loss of profitability and customer satisfaction. This study aims to examine the reverse logistics factors that affect the firm performance. Despite the extensive literature on reverse logistics, there is a gap in our knowledge to what extent they affect firm performance. There is a growing literature on assessing the impact of reverse logistics upon firm performance, and, to our knowledge, this is the first study that synthesises three research streams (resource-based view of the firm, relational theory, and institutional theory) to develop a research model. This study contributes to practitioners by offering them insights how to design effective reverse logistics and integrate them with forward logistics.

The remaining of the study is organised as follows: The following section reviews the literature on reverse supply chains. Last section discusses research, policy, and managerial implications and makes recommendations for future research in this area.

2. Literature Review

Studies about reverse logistics appear in the eighties and mostly deal with technical and operational issues such network design, optimisation, and production planning (Barnes, 1982). Rubio et al. (2008) reviewed 196 research articles on reverse logistics published between 1995 and 2005 and found that 65% of them used mathematical models and 21% case studies mainly dealing with the recovery of end-of-life products and inventory management. Efforts to synthesize the research in an integrated broad-based body of knowledge have been limited and information is mostly anecdotal (Jayant et al. 2012). Bernon et al. (2011) synthesized empirical findings and literature regarding retail reverse logistics operations and proposed that they are multi-faceted and need to be managed as an integrated supply chain activity. Ramirez (2012) surveyed 284 Spanish firms and found that reverse logistics management improves organizational performance conditioned by the creation of logistics knowledge. Ye et al. (2013) surveyed 209 manufacturers of Pearl River Delta in China and found that although product recovery had a significant positive impact on both economic and environmental performance, product return had a negative impact on the firm's economic performance and no effect on the firm's environmental performance.

Apart from anecdotal studies, there is little guidance to what extent reverse logistics contributes to firm performance. This study draws on three research streams of literature to develop a reverse logistics model. Initially, we review studies from the resource-based view of the firm, relational theory, and institutional theory. The factors that influence reverse logistics are reviewed under three categories: firm factors, supply chain factors, and institutional factors (Figure 1).

<<Insert Figure 1 about here >>

2.1. Reverse Supply Chains

A forward supply chain can be viewed as the flow of product and materials from producers to end consumers via intermediaries like wholesalers and retailers. The reverse supply chain refers to the backward flow of products recovered from users. There are different definitions of reverse logistics with some researchers emphasising the economic aspect of reverse

logistics (Ravi et al., 2005). Mutha and Pokharel (2009) argued that reverse logistics can be seen as a forward chain re-designed to manage the flow of products backwards from customers to manufacturing for refurbishment and reproduction. Richey et al. (2005) pointed out the environmental impact of returned products.

2.2. Reverse Supply Chain Factors

2.2.1. Firm Factors

According to the resource-based theory, firm resources and capabilities determine firm performance and sustainable competitive advantage (Penrose, 1959; Peteraf, 1993). Therefore, a firm should develop logistics strategy on its core competencies in order to reduce costs and maximize their value offer (Olavarrieta and Ellinger, 1997; Dowlatshahi, 2000; Wong and Karia, 2010; Ramírez et al. 2011). Reverse logistics strategy is of critical importance in managing the reverse direction in supply chains–from consumer to producer– which counts for 1/5 in some industries (Dowlatshahi, 2005; Autry, 2005). The volume of return goods is hard to predict, therefore a RL strategy needs to dictate return policies and procedures and integrate them with forward logistics operations (Gang et al. 2009).

Genchev et al. (2010) examined the reverse logistics using the resource-based view (RBV) and argued that companies should allocate their resources to developing reverse logistics programs in order to avoid the potential negative impact on the bottom line. Conversely, if adequate resources (tangible/intangible or property-based/ knowledge-based) are targeted to reverse logistics programs, companies may gain a tremendous positive financial impact as well as important relational implications. González-Torre et al. (2010) examined the effect of various factors including financial and human resources upon the adoption of environmental oriented reverse logistics and found that constrains in firm resources hinder the adoption of reverse logistics. Ramirez (2012) used the resource-based theory to examine whether reverse logistics improves firm performance conditioned by the creation of knowledge and found that those companies which develop their capacity to generate new knowledge are able to reduce the uncertainty of RL processes, which in turn increases firm performance.

Therefore, we propose:

Proposition 1: Reverse logistics strategy has a positive effect on their firm performance.

Operations management is concerned with all areas that affect the company on a daily basis. A non-optimised management process results in waste and increased operating costs. Weeks et al. (2010) studied reverse logistics strategies on firm profitability through operations management on scrap steel industry and found that although operations management alone does not have a positive impact on profitability, the combined effect of production mix efficiency and product route efficiency do have a positive impact on firm profitability. Regardless of whether manufacturers choose to engage in product recovery to increase production mix efficiency and product route efficiency, meet customer demands, enhance brand image, or pre-empt regulation, they face a strategic operational choice: contract with third parties, establish joint ventures, or vertically integrate into reverse supply chains? (Toffel, 2004).

There are three models of reverse logistics operations:

Joint reverse logistics

Joint ventures in reverse logistics refers to horizontal alliance between firms in an industry that carry out reverse supply chain operations such as establishing a recycling centre, collaborative transportation and joint quality control (Kasper et al, 2011). A typical joint reverse supply chain contains four areas of collaboration: (i) waste disposal, (ii) product/part/material in sales, (iii) cost sharing, and (iv) profit distribution (Nnorom et al., 2009).

Recent developments of RBV consider a firm's core competence to be its ability to react quickly to situational changes and build further competencies or dynamic capabilities (Teece, 2007; Halldorsson et al. 2007). For example, Zhan and Chen (2013) examined dynamic capabilities in international joint ventures and found that this hybrid organisational form benefits from exploitation capability and exploration capability especially when the cultural distance between partners is small. In joint ventures, efficiency may not only be explained in terms of productivity, production mix efficiency or product route efficiency, but also as the ability to explore and exploit partner's core competencies via contractual arrangements as an alternative to building such competencies internally (Haakansson et al., 1999). Outsourcing decisions are usually based on the idea of focusing on core competencies and outsourcing complementary competencies to external partners. Joint venturing decisions are based on learning, uncertainty avoidance, hold-up risks, and scale.

Joint ventures can be a better mechanism to manage uncertainty in reverse logistics which can be higher than forward supply chains due to the following reasons: (1) the uncertain timing and quantity of returns, (2) the need to balance demands with returns, (3) the need to disassemble the returned products, (4) the uncertainty in materials recovered from returned items, (5) the requirement for a reverse logistics network, (6) the complication of material matching restrictions, and (7) the problems of stochastic [random] routings for materials for repair and remanufacturing operations and highly variable processing times.

Close-loop logistics

Following RBV, there is a recent stream of research examining manufacturing competencies and RL in particular as an ability to improve the profitability of manufacturers (Koufteros et al., 2007; Weeks et al., 2010). RL can be seen a capability that allows manufacturers to use existing resources in alternative yet cost-effectively and ecologically friendly way by extending the product's normal life beyond its traditional usage (Lai, Wu, and Wong, 2013). Combining forward and reverse supply chains leads to the concept of closed-loop supply chains. Guide Jr. and Van Wassenhove (2009) defined closed-loop supply chains as the, "*design, control, and operation of a system to maximize value creation over the entire life cycle of a product with dynamic recovery of value from different types and volumes of returns over time*." The management of close-loop supply chains is a dynamic capability. For example, closed-loop supply chains must perform operations such as forecasting the return of items into the system, organizing recovery locations with the network, and managing the inventory of both new and used items are just (Brito and Dekker, 2004). According to Flapper et al. (2005), there are four types of close-loop supply chains: production-related, distribution-related, use-related, and end-of life. The production-related close-loop supply chains are characterized by obsolete materials, production scraps, and production defects below preset quality levels. For example, NEC Computers, a subsidiary of the NEC

Corporation group, created the Notebook Server Recovery department to deal with repairs that take longer than 24 hours as well as analyse the failures that occurred in production and relay their findings back to the production departments along the chain to produce more accurate forecasts (Geyer et al., 2005). Distribution-related close-loop supply chains refer to commercial returns of products that are sold with a return option, wrong deliveries as the products are refused by customers because they are delivered too early or too late, or otherwise not conforming to specification, and product recalls resulting from safety problems. Return policies reinforce customer loyalty and can prove effective in online sales directly from the manufacturers. Use-related close-loop supply chain refer to products currently in use but in need if RL due to warranties and repair services. Finally, products close to their end-of-life are returned back to manufacturers to extract valuable and components and rare materials for reuse. The sustainability of reverse logistics and the environmental management of product life cycle can be considered as extensions to the existing dynamic capabilities of close-loop supply chains.

Outsourcing reverse logistics

Within the scope of RBV, outsourcing is a strategic decision that entails contracting of non-strategic activities to third-parties which are more capable firms to undertake reverse logistics activities (Espino-Rodriguez and Padron-Robaina, 2006). To this respect, companies do need to develop RL capabilities and at the same time they free resources and capital to focus on core competence. Azadi and Saen (2011) argued that the main advantage of outsourcing services in RL is that third-party logistics (3PL) providers allow companies to get into a new business, a new market, or a reverse logistics program without interrupting forward flows; in addition logistics costs can be greatly reduced. Logozar (2008) stated five areas of Outsourcing RL: (i) Specialized high value product collection and consolidation (ii) Commercial waste collection, sorting and marketing, (iii) Specialized commercial waste collection, processing and marketing, (iv) Dealing with reusable packaging and pallet pools, and (v) Green product validation. Serrato et al. (2007) developed a Markov decision model of the outsourcing decision and found the presence of an outsourcing threshold above which it is optimal to outsource reverse logistics. Furthermore, the variability in return volumes motivates outsourcing RL and when the return fraction is higher, outsourcing thresholds are smaller and the probability of crossing them is higher. Cheng and Lee (2010) used Analytical network process (ANP) based on the RBV approach to help decision makers identify which activities must be performed inhouse or outsourced.

Therefore, we propose:

Proposition 2: Joint reverse logistics, Close-loop logistics, and Outsourcing reverse logistics have a positive effect on Firm Performance.

Customer Loyalty

Extensive literature suggests that a consumer satisfaction induces a competitive advantage for the firm (e.g. Williams and Naumann, 2011; Siomkos et al., 2006). For example, Srivastava et al. (1998) suggested that high customer satisfaction leads to an acceleration of cash flows, an increase in the volume of cash flows, and a reduction in risk associated with those cash flows. Williams and Naumann (2011) conducted a longitudinal analysis of customer attitudes in relation to various company performance metrics of one large Fortune 100

company over a five-year period and found that there are significant, and moderate-to-strong associations between customer satisfaction and a firm's financial and market performance such as revenues, earnings per share, and stock price. On the other hand, uncertain consumer demand has been shown to be a barrier to in the retail sector (Reynolds and Hristov 2009).

In this study, we define customer loyalty as the ability of the firm to stimulate and maintain cognitive and affective outcomes of post-purchase, which entails comparing consumer expectations with actual product or service performance. A large body of research has found a strong, positive relationship between customer loyalty and repurchase intention (Anderson and Mittal, 2000; Cooil et al., 2007; Seiders et al., 2005). The adoption of reverse logistics is following the trend of developing environmental friendly businesses. Therefore, reverse logistics may increase customer satisfaction and create a basis for customer loyalty. Consumer loyalty may improve profits through reduced consumer acquisition costs and lower price sensitivity and higher price tolerance (Reichheld and Teal, 1996). Hazen et al. (2012) suggested that consumers' satisfaction of green reverse logistics leads to increased levels of loyalty to the firm.

Prahinski and Kocabasoglu (2006) reviewed the literature in reverse supply chains and proposed that service quality and recovery strategies influence satisfaction and dissatisfaction, which in turn influences repurchase intentions in the reverse supply chains. Furthermore, improved service quality in the reverse supply chains positively influences customer satisfaction and customer satisfaction in the reverse supply chains positively influences repurchase intention. Ramanathan (2011) examined the relationships between performance of companies in handling product returns and customer loyalty and found that handling product returns plays an important role in shaping customer loyalty for low-risk products.

Therefore, we propose:

Proposition 3: Customer Loyalty in Reverse Logistics has a positive effect on Firm Performance.

2.2.2. Supply Chain Factors

Transaction Cost Economics & Supply Chain Management

Transaction cost economics (TCE) has been an established theory for analysing how an organization economises on transactions costs by selecting governance structures than minimise costs (Coase, 1937; Williamson, 1975). According to Williamson (1981, p. 552), '*a transaction occurs when a good or service is transferred across a technologically separable interface'*. The critical dimensions for describing transactions are: uncertainty, frequency, and asset specificity (Williamson, 1975). The theory has been tested empirically numerous times and summarized in several meta-studies (David and Han, 2004l Macher and Richman, 2008). Criticism of transaction cost economics argues that the theory is self-bounded on cost minimization providing little insight into strategic marketing choices that are undertaken by exchange partners who create and claim value (Brouthers et al. 2003). Brandenburger and Nalebuff (20011) argued that firms rarely create value in isolation, but they align themselves

with customers, suppliers and other partners to co-develop markets and co-expand existing ones.

Collaborative exchange relationships are not static; rather they evolve through development processes (Eggert et al., 2006). In this respect, the coordination and integration of supply chains is a value-added, dynamic capability that can reduce transaction costs. Dwyer et al. (1987) presented a process of collaboration evolution with four stages: awareness, exploration, expansion, and commitment. Zajac and Olsen (1993) proposed a stage model of inter-organizational processes with 3 stages: initialization, processing, and reconfiguration. On initialization stage, partners weight exchange alternatives, ex-ante project the ex-post exchange costs. This stage is a preparation stage with partners designing their supply chain operations. On processing stage, partners learn about and from each other, develop supply chain knowledge, which is an intangible asset with high specificity, manage conflict derived from transaction uncertainty and develop trust through frequent, successful transactions (Liu et al., 2013). Supply chain efficiency can be used to operationalize the processing stage since supply chain partners reduce transaction costs in this stage (Blome et al., 2013b). On reconfiguring stage, partners assess their supply chain performance and attempt to improve it by redefining their supply chain strategy and reshaping the nature of relation via cultivating a culture of collaboration than competition (Cao and Zhang, 2011). The characteristic of this stage is the long-term orientation of transactions that necessitate the development of supply chain strategy and its integration with the business strategy since long-term business relations impact upon the boundaries of the firm (Williamson, 1981). Supply chain strategy can reduce transactions costs since asset specificity increases and uncertainty decreases. Specifically, site-asset specificity, such as ante investments in sites like distribution or warehouse centres to minimise transportation and inventory costs, increases since partners develop a supply chain strategy (Lamminmaki, 2005). Physical asset specificity, i.e. investment in specialised equipment, and machinery that lower transaction costs compared to outsourcing, also increases. Intangible assets like ‘greening’ the brand name that generates brand loyalty and repeated sales via a specific reverse channel (Chen, 2010). Regarding uncertainty, volume uncertainty, which is created by poor forecasting of future demand patterns, is reduced by sharing of strategic information between retailers and manufactures like future new products, retail stores, and customer preferences (Mukhopadhyay and Setaputra 2011). Technological uncertainty, stems from the lack of resources, information or intelligence to allow firms to ascertaining the concurrent decisions and actions of their trading partners, can be reduced with the strategic collaboration around emerging technologies (Vijayasarathy, 2010). Finally, long-term collaboration can protect companies from behavioural uncertainty which results from opportunistic behaviour where one or more parties may resort to behaviours such as lying, cheating, deceitful concealment of information, or violating formal or informal agreements to further their own self-interest (Crosno and Dahlstrom 2008).

Williamson (2008) recently pointed to the need for further elaboration of the link between TCE and Supply Chain Management (SCM). Supply chain management has the objective to integrate and coordinate the supply chain of heterogeneous organisations into a homogenous process. Coordination can be achieved via different mechanisms such as market mechanisms, contracts, and partnership arrangements, which lead to the increasing efficiency of all partners. Although the origin of Operations Management is closely linked with the birth of the company itself, supply chain management (SCM) was originally introduced by consultants in the early 1980s and subsequently has attracted growing researchers’ attention (New, 1997; Chen and Paulraj, 2004; Vlachos et al. 2008). lfalla-Luque and Medina-Lopez (2011) examined the evolution of supply chain discipline around three areas: Supply chain

integration, information management, and supply chain strategy. A growing body of evidence highlights the importance managing the supply chain in improving competitiveness by reducing uncertainty and enhancing customer service (i.e. Burgess et al., 2006; Vlachos and Bourlakis, 2006 ; Arora and Raisinghani, 2012).

Efficiency in Reverse Supply Chains

Efficiency of forward supply chains has been studied during the last two decades (i.e. Coppini et al. 2010; Bayraktar et al. 2009; de Souza and D'Agosto, 2013). Several studies have focused on the 'bullwhip effect', namely the natural tendency of decentralised decision making to amplify, delay and distort demand information moving upstream in a make-to-stock supply chain (Wangphanich et al. 2010). However, efficiency in reverse supply chains has not received considerable attention yet. Sharing demand and/or inventory data with retailers can improve the manufacturer's order quantity decisions in multi-stage serial systems, because knowledge asset specificity reduces the demand uncertainty faced by the supplier. For example, sharing point-of-sales demand enables the manufacturer to improve its forecast accuracy, refine deliver schedules, and reduce inventory costs (Ryu et al. 2009). Lee et al. (2000) quantified cost reductions due to information sharing as 12–23% while de Souza and D'Agosto (2013) reported that 1.21% cost reduction in scrap tire reverse logistics chains. Hsu et al. (2009) surveyed senior purchasing and operations managers and reported that supply chain management practices mediate the relationship between operations capability and firm performance. Vanichchinchai and Igel (2011) investigated the relationships among total quality management practices, supply chain management practices, and firm's supply performance in the automotive industry in Thailand and found that total quality management can be used as a foundation for implementing supply chain management and improving firm's supply performance. Blome et al. (2013a) examined the antecedents of supply chain agility and their effect on operational performance based on evidence collected from large-scale mail survey targeting multi-national firms located in Germany and found evidence of supply chain agility mediating the relationship between supply- and demand-side competence and performance.

Therefore, we propose the following:

Proposition 4: Efficiency in Reverse Supply Chains is positively related to Firm Performance.

The advantages of collaborations have been documented by various studies in the supply chain literature (Christopher, 2005; van Hoek, et al. 2008; Daugherty et al., 2009). Collaboration reduces transaction uncertainty especially when it becomes strategic. Due to the nature of information uncertainty of the return products, manufactures find it difficult to act proactively and predict upcoming reverse logistics activities. Information sharing reduces reverse operations uncertainty as well as helps to overcome planning complexities in the reverse supply chain (Hernández, Poler and Mula, 2011). For example, Web-based collaborative return systems are commercial systems that aim to manage reverse logistics activities (Jayaraman et al., 2008). These systems are based on secure web servers that consolidate data from suppliers, manufacturers, third-party logistics providers, repair depots and customers, and provide to supply chain partners visibility over the flow of materials, inventory control, and coordination of return process.

Cao and Zhang (2011) studied supply chain collaboration and explored its impact on firm performance using data collected through a Web survey of U.S. manufacturing firms in

various industries. Results indicated that supply chain collaboration improves collaborative advantage and influence firm performance as well as that collaborative advantage mediates the relationship between supply chain collaboration and firm performance for small firms while it partially mediates the relationship for medium and large firms. Dobrzykowski et al. (2012) explored four supply chain practices using a global survey of 711 firms in 23 countries and found that procurement capability was positively associated with firm performance. Vereecke and Muylle (2006) examined supplier and customer collaboration and performance improvement by surveying 374 firms from the engineering/assembly industry across 11 European countries and reported weak empirical support for the hypothesized positive relationships between supplier collaboration and performance improvement.

Therefore, we propose:

Proposition 5: Collaboration in Reverse Supply Chains is positively related to Firm Performance.

2.2.3. Institutional Factors

Institutional theory

Institutional theory implies that a strong motivating force behind firm behaviour is socially based and proposes that an organization is bound to satisfy its social stakeholders (Rogers et al., 2007; Burns and Wholey, 1993). Institutional theory can explain why companies engage in actions countering the efficiency arguments of traditional economic thought when attempting to conform to social norms and stakeholders logic instead (Miemczyk, 2008). Recent studies have provided empirical evidence that explain firm-level behaviours using institutional theory (Hillebrand et al. 2011; Ye et al., 2013; McFarland et al., 2008).

Isomorphism is a key concept in institutional theory and the main factor leading organizations to adopt similar structures, strategies, and processes. A key tenet of institutional theory is that organizational isomorphism increases organizational legitimacy (Deephouse, 1996) which can defined as the perception that the actions of the organizational entity are desirable, proper or appropriate within socially constructed system of norms, values, beliefs and definitions (Kauppi, 2013). According to DiMaggio and Powell (1983) there are three types of mechanisms towards institutional isomorphism: coercive, mimetic and normative.

Coercive isomorphism is found when a powerful firm exercises a coercion to serve its own interest by demanding that partners adopt its favourable operational practices (Liu et al., 2010). Further, companies face coercive isomorphism from customers and government to incorporate social, environmental and economic responsibility considerations into their operations (Sarkis et al., 2011). Conforming to coercive isomorphism makes companies to be perceived as more legitimate (Zhu and Sarkis, 2007). However, the attempt to balance conflicting demands by adopting business operations out of coercive pressures does not always lead to operational efficiencies (Miemczyk, 2008).

Mimetic isomorphism occurs due to firms facing uncertainty are likely imitate the business models of other firms perceived as successful and legitimacy. Learning from others best operational practices, benchmarking, and supply chain mimesis produce ‘standard responses to uncertainty’ which reduce the risk of unexpected outcomes (DiMaggio and Powell, 1991, p. 67). However, best practices do not produce the same results in every company due to contextual mismatches making imitation lead to suboptimal results (Kauppi, 2013).

Normative isomorphism occurs due to professionalization, a social move by members of an occupation to define the qualifications, ethics, and methods of their work to establish greater legitimacy for their occupation, creating homogeneity and legitimacy over time DiMaggio and Powell, 1983).

Government Support

Whereas normative isomorphism produces legitimacy from shared values, government's coercive isomorphism seeks conformance to technical, process, or output legitimacy (Taylor and Warburton, 2003). Therefore, acceptance of government support can be interpreted as a response to coercive isomorphism to produce legitimacy to norms about green supply chains. Porter (1991) suggested that strict environmental regulation will have an innovation effect to companies forced them to trigger the discovery and introduction of cleaner technologies and environmental improvements. Contrary to traditional economics view that companies had to sacrifice part of the profits to reduce an externality like pollution, the Porter Hypothesis (PH) poses that companies benefit from making production processes and products more efficient since they can achieve cost savings sufficient enough to overcompensate for both the compliance costs directly attributed to new regulations and the innovation costs (Porter and van der Linde, 1995). Therefore, well-designed regulation can protect the environment and increase the industry competitiveness at the same time.

Therefore, we propose:

Proposition 6: Government Support of reverse logistics is positively related to Firm Performance.

Cultural Alignment

Based on institutional theory, conforming to government support can be considered as a response to coercive isomorphism, then, cultural alignment can be interpreted as a response to mimetic isomorphism (DiMaggio and Powell, 1983). Companies choose to "model" their supply chains after other organizations that they consider more progressive, legitimate or successful in managing reverse logistics. The operationalization of mimetic isomorphism has received little attention in operations management, especially in reverse logistics (Kauppi, 2013). Aligning reverse logistics to a business culture that is isomorphic to ecological sustainability can provide the sought-after legitimacy the institutional theory imposes. Specifically, societal and resource drivers impose industry to focus on ecological sustainability (Zailani et al. 2012). Growing concerns about climate changes, local and regional impacts of air, ground and water pollution from industrial activities have significantly expanded the interaction between environmental management and operations.

Therefore, we propose:

Proposition 7: Cultural Alignment of reverse logistics is positively related to Firm Performance.

3. Discussion

This study contributes to the existing body of knowledge in the three ways:

First, it provides a theoretical framework to study RL practices based on three research streams: Resource-based view of the firm, relational theory, and institutional theory. Particularly, seven variables were examined: Reverse logistics strategy, Operations management, Customer Loyalty, Efficiency in Reverse Supply Chains, Collaboration in Reverse Supply Chains, Government Support and Cultural Alignment. Joint ventures are preferable when reverse logistics requires transaction-specific investments since this organisational form mitigates hold-up risks better than markets or outsourcing (Williamson and Ghani, 2012). Joint ventures can be considered as a hybrid organisational form that benefits from the exploitation capability and exploration capability of partners. In addition, Zhan and Chen (2013) argued that joint ventures are preferable when the cultural distance between partners is small. Joint collaborations allow reverse logistics models to scale fast. On the contrary, managing closed-loop supply chains is a dynamic capability which currently many companies seem to lack. Another benefit of joint collaborations is that they increase asset specificity in supply chain transactions and reduce supply chain uncertainty.

Third, effective reverse logistics can have a positive impact on the environment as well as the financial performance. This supports the Porter Hypothesis (PH) that well-designed regulation can protect the environment and increase the industry competitiveness at the same time.

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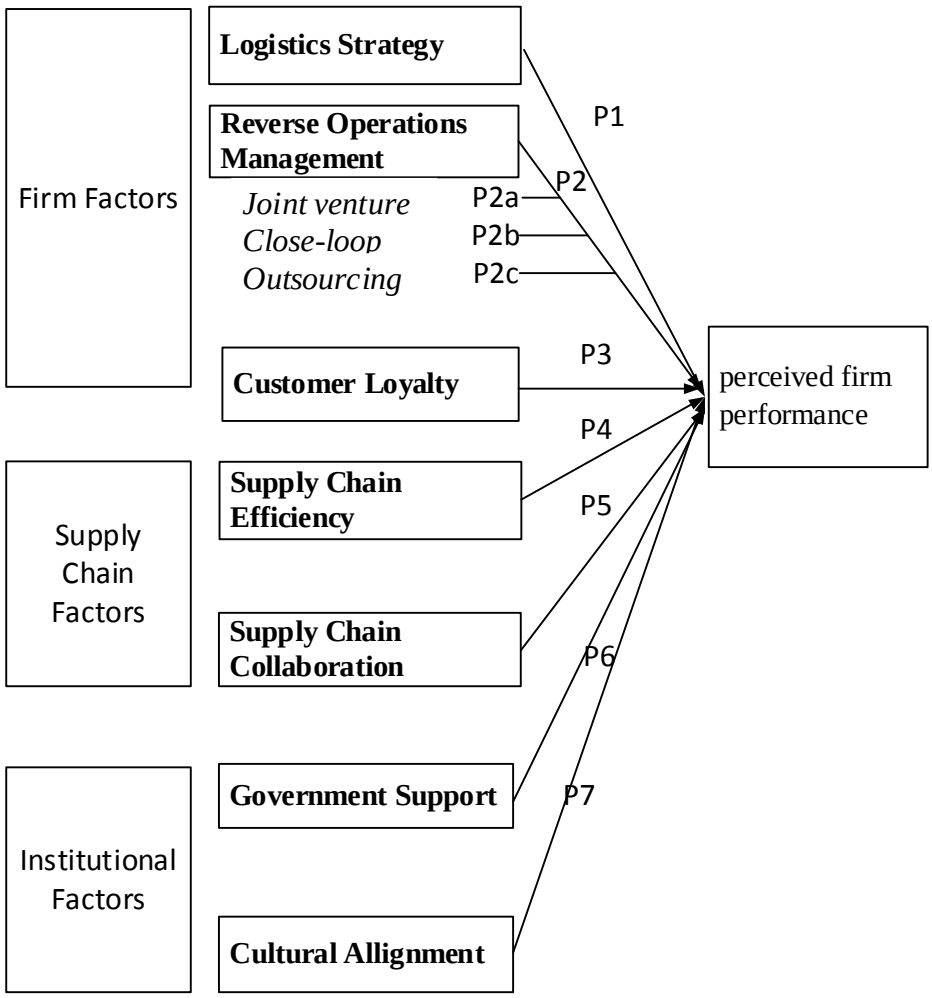

Figure 1 Research Model and Propositions