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## Green information, green certification and consumer perceptions of remanufactured automobile parts

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### ABSTRACT

Manufacturers face several obstacles when marketing remanufactured products, and therefore need to be able to appeal to consumers' motivational desires in order to influence their purchase decisions. Informed by regulatory focus theory, this research contributes to this area of research by examining the role that information regarding green attributes (energy saving, material saving and emission reducing) of remanufactured products and green certification play in influencing consumer perceptions. Potential consumers of remanufactured automobile parts in China were surveyed and the data were analyzed via structural equation modeling. The results suggest that energy saving, material saving and emission-reduction information regarding remanufactured products positively affect consumers' perceived value and trust of remanufactured products. Green certification moderates the relationships between both the energy saving and material saving information and trust. This research improves understanding of how firms can influence consumer perception of remanufactured products, thus contributing to the discourse in the literature on remarketing of remanufactured products. The findings can be used to inform practitioners who seek to optimize the value proposition of achieving green certification and informing consumers about the environmentally friendly attributes of remanufactured products.

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### 1. Introduction

The auto parts industry plays a crucial role in driving innovation in remanufacturing while reducing negative environmental and social impacts of manufacturing. This industry alone is valued at approximately \$1.1 trillion worldwide, and is comprised of remanufacturers that service many types of automotive components that are located in several countries. Due to the size of this industry, auto part remanufacturing firms are under increased scrutiny from governmental agencies and their consumers to improve environmental management of their remanufacturing operations. Therefore, proper management of remanufacturing sustainability issues has the potential to impact company valuation and consumer perception. Demonstrating increased, quantifiable performance in specific sustainability areas will drive competitiveness and better value to the consumer. Such areas include (but are not limited

to): (1) reducing energy use in the remanufacturing process, (2) improving resource efficiency through effective waste management practices, (3) ensuring highest qualities of standards via proper certification, and (4) adequately managing environmental and social externalities (SASB, 2014). Importantly, firms need to signal their advancements in these areas via disseminating information about their products and processes to consumers in some regard.

Today's auto part consumers are essential for the success of remanufacturers, who need to convince consumers to choose a remanufactured component versus purchasing a new, original equipment manufacturer (OEM) item. Consumers are always on the search for qualities of products that fall in line with their personal views on social issues, environmental issues, and personal brand preference. The motivation of the consumer as well as the desire to ensure sustainability of supply operations drives companies to reduce environmental risks, reduce waste, and enhance operational efficiencies (Singh et al., 2011; Lin et al., 2015). To this end, consumers need to be informed of the inherent environmental friendliness of remanufactured products. This means the consumers need to better understand how and why reman-

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ufactured products can be an environmentally friendly option. One manner that firms seek to ensure and publicize environmentally friendly manufacturing, remanufacturing, and distribution practices is to seek recognized green certifications, like ISO 14001 certification. The ISO 14001 certification provides guidance to organizations on incorporating environmentally sustainable design into its manufacturing processes (Savita et al., 2012).

This research examines how information regarding the environmentally friendly attributes of remanufactured products (in terms of energy saving, material saving and emission reducing information) affects consumer perceptions of such products, and informs practitioners who seek to optimize the value proposition of disseminating such information, as well as achieving green certification. Addressing consumers' perceptions of remanufactured products is particularly important because of the variety of ways a consumer can make decisions about remanufactured products. Therefore the perceptions of consumer value and trust toward remanufactured goods are investigated. Although many people assume that green certification should enhance consumer value, the role of such certification has been largely untested. As such, the role of green certification is analyzed in terms of its intensifying effects on the relationships between information regarding three specific environmental attributes and consumer perceptions of remanufactured products.

This research also contributes by introducing regulatory focus theory into the CLSC realm. Regulatory focus theory focuses on the consumer's desire to make purchase decisions that fulfill internal motivations. The theory is used to assess the marketing of remanufactured products and how the different aspects of green certification and labeling affect consumers' perception of the product in terms of value and trust. The theory adds a new perspective to CLSC, academics can examine aspects of consumer behavior that have not adequately been addressed in previous CLSC research.

The study addresses the following research questions:

1: How does one's perception of value and trust of remanufactured products affect his or her intention to purchase remanufactured products?

2: Does information regarding green attributes of remanufactured products affect his or her perceived value of and trust toward remanufactured products?

3: How does a company's green certification affect the relationships between information regarding green attributes and consumers' perception of trust regarding remanufactured products?

The remainder of this article proceeds as follows. The conceptual foundations are provided in the next section, followed by development of the hypothesized model. The methodology section discusses the survey instrument and structural equation modeling procedures, before results are presented. The discussion section provides implications for research and practice. The paper closes with a brief discussion of research limitations and avenues for future research.

## 2. Theoretical framework and hypotheses development

### 2.1. Theoretical framework

The hypothesized model examines how perceived value and trust regarding remanufactured products affect one's intention to purchase them. The model contains three knowledge considerations pertaining to remanufactured products (energy savings, materials, and emission reduction) as exogenous variables that contribute to perceived value and perceived trust. The influence of green certification is included as a moderator of the relationships between the information variables and perceived trust. In

the remainder of this section, the literature and theory that support these proposed relationships are reviewed.

Consumer decision-making can be motivationally driven or based on information only. Consumers decide what to buy based on more than information collected and analyzed about a product, often making decisions based upon a desire to feel better about themselves. Consumers make decisions in the context of goals and ideals they are pursuing, representing needs they wish to fulfill (Pham and Higgins, 2005). The regulatory focus theory of consumer behavior reflects this motivational context. Within this theory, the approach to choosing products is conceptualized in terms of a strategic means for self-regulation (Higgins, 1997). A self-regulation toward desired end-states, based on the consumer's goals and desires, enables a consumer to make decisions that either do or do not make them feel like they are approaching a desired goal or end-state emotionally. Consumers want to make choices that are aligned with their emotional and personal goals, making them feel like they are making advancements and accomplishments through their buying choices.

As this theory can be used to inform consumer perceptions, it was found to be an appropriate lens through which to frame the current research. As a consumer looks at the benefits of buying remanufactured products, he or she can see the demonstrated reduction in new materials being used, the focus on recycling and recovering value from previously discarded items, and the projected positive impact on the environment. These are all aspects a consumer can take in at an emotional and motivational level to aid them in making choices that move them closer to their goals of being environmentally conscience. Regulatory focus is characterized by the greater eagerness of consumers to seek out items that are positively promoted to match their motivational ideals and beliefs (Pham and Higgins, 2005). They want to ensure they are buying products that fulfill their internal motivations. They may fear missing the mark and picking the wrong product and therefore have a greater eagerness to seek out and purchase products that fit with their beliefs (Crowe and Higgins, 1997).

It has been shown that a firm can provide clues to activate or prime a consumer's decision process in terms of regulatory focus theory. By properly marketing, labeling, and reinforcing with consumers that a product or activity is aligned with their motivational goals, the firm increases the likelihood of making a sale (Higgins et al., 1994; Pham and Avnet, 2004). This is due to the nature that promotions by a firm (for example, their ISO 14001 green certification) are characterized by a strategy of approaching matches to the desired end-state of the consumer. It has been shown that positive cues are a greater influence on consumer decisions to purchase than negative cues (Pham and Higgins, 2005). This knowledge aligns with the thought that marketing and promoting the environmental aspects of a firm's remanufacturing processes and remanufactured products can positively impact a consumer's desire to purchase the firm's remanufactured components.

Another aspect of regulatory focus theory that applies to this domain is the, "How do I feel about it" heuristic (Schwarz and Clore, 1983, 1996). This is the idea that consumers apply this heuristic to their buying decisions. It supposes that if they have positive feelings about the product or firm, they are more inclined to make a purchase decision, even if it is counter to factual information analysis. Pham and Avnet (2004) found when a firm markets their product in the context of ideals and attitudes, there is a positive impact that influences the consumer to make the purchase.

The applicability of regulatory focus theory to the idea that consumers make purchasing decisions that align with their environmental thoughts is very applicable to this research. It also supports the idea that firms should capitalize on these notions when they are branding and marketing their remanufactured com-

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