



Non-differentiated green product positioning: Roles of uncertainty and rationality[☆]



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ABSTRACT

This study examines the effect of market uncertainty and consumer rationality on product strategy when a company evaluates its entry into the green market. The risk in launching a green product is high because consumers may not be as environmentally conscious as they claim to be. This study develops a composite condition consisting of preference uncertainty, loss aversion, investment cost, and competition intensity to guide companies to react either conservatively or aggressively. An upgraded non-differentiation strategy is suggested for heterogeneous markets, loss-averse consumers, or high-quality reference when the indicator falls within the greenness range. Unlike conventional competitive analysis for non-green products, differentiation may not always be the best option to benefit the entire society and non-differentiation to green is favorable in the context of our analysis.

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1. Introduction

The contemporary consumer market has been calling for a green revolution in the form of eco-friendly products. However, manufacturers entering this market often encounter competition from similar products and uncertainty in market preference. Thus, the question that manufacturers often ask when their competitors move toward greenness is “Should I follow the move to produce green products or stay on the current position?” The source of uncertainty can be attributed mainly to a *green gap*, which is a form of an attitude-behavior gap, in which the actual purchase may not coincide with consumers’ claimed willingness (Mitchell, 1999; Gupta and Ogden, 2009; Stanforth and Hauck, 2010). Business survival becomes a major challenge in entering the green market because of this unfathomed green gap (Sheehan and Atkinson, 2012). The green gap results in insufficient green purchases despite that more than 50% of consumers having expressed their willingness to pay a high premium for green products (Simon, 1992). Two decades later, the phenomenon remains, and only one-third of consumers who claim to be environmentally conscious make a real purchase (Shelton Group, 2014; Business Insider, 2014). Thus, to overcome such a challenge, the present study extends existing competitive analysis to guide companies in promoting green products.

Despite the presence of green gap, human rationality has also been reported important in green purchase (Mitchell, 1999). However, the role of consumer behavior is often ignored in competitive analysis. The rationality behavior considered in the present study refers to the asymmetrical effect between the loss and gain of consumers or the effect of loss aversion,

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which states that aversion to perceived loss is stronger than the enjoyment of a received gain in light of the offered environmental quality. For example, a portable device with an environmental-friendly universal charger is currently the mainstream. A device with a proprietary charger, which harms the environment, disappoints consumers and results in a perceived loss in the negative direction of environmental quality based on the reference perception in mainstream products (Van Dam and De Jonge, 2014). Thus, consumers are loss averse when evaluating the environmental quality of power chargers. This effect of loss aversion can successfully promote green practice if the effects can be exploited (Sheu, 2014). Therefore, this study develops a set of green product strategies through a generalized Hotelling's competitive model (Hotelling, 1929; d'Aspremont et al., 1979), in which consumer preferences are probabilistic and the perceived value to environmental quality is loss averse (Kahneman and Tversky, 1979; Köszegi and Rabin, 2006).

The analysis performed in the current study differs from other profit-oriented research because ethics and uncertainty issues are involved. Thus, conventional Hotelling's competitive models would be insufficient in the discussion of green marketing. Our vertical competition model in product positioning incorporates the prospect theory and considers preference uncertainties, competition intensity in environmental qualities, consumer preferences in greenness, consumer rationality, and eco-design costs. Inherent quality is excluded from our discussion because it is not in our focus on greening behaviors.

This study contributes to the literature by suggesting green product strategies from the perspective of competition and production in a market that exhibits purchase uncertainties and consumer behavior rationality. We suggest operational strategies to deal with the risk of launching green products by considering the cost of product improvement, the effect of consumer loss aversion, and the tendency toward environmental consciousness.

2. Related literature

Literature that investigates green product strategies by considering the green gap and loss aversion is limited. Three streams of literature, namely, green product strategies, green marketing, and consumer rationality, are related in part to the findings of this study.

A green product strategy is a company strategy that pursues profitability and environmental responsibility (Papagiannakis et al., 2014). Product green design also affects the manufacturing process and the closed loop supply chain (Kristianto and Helo, 2014). Company strategies discussed in previous studies have received considerable attention, and differentiation is often suggested for regular marketing practice. However, green product strategies that deal with competition have not received sufficient attention in the literature on green marketing and innovation. Amacher et al. (2004) emphasize that the extent of vertical differentiation in environmental quality depends on the cost of undertaking quality improvement, and eco-labeling can effectively reduce such costs. Chen and Sheu (2009) contend that competition and legislation urge firms to modify their product recyclability design. Chen and Sheu (2013) suggest that competition encourages product eco-design if the improvement cost is acceptable. Moreover, Baldwin et al. (2006) demonstrate the learning interaction between inferior users and superior manufacturers by employing Hotelling's vertical competition model with exogenous location variables. Rezapour et al. (2015) also investigate the trade-off in product design in the choice between green and low-priced features. Neven (1986) suggested that firms should compete closely for a concentrated market but the result seems to be intuitive and not applicable to an irregularly distributed market. Liu et al. (2004) investigate product-positioning strategies through a generic consumer preference distribution; however, only numerical results were obtained. The present study confirms the diversified results of previous studies and also understands the effect of distribution pattern of consumer preference.

Green marketing involves selling environmental-friendly products, which possess special characteristics in ethical issues (Matthes and Wonneberger, 2014). Green gaps refer to the phenomenon in which consumers of certain goods behave differently from what they claim. Green gaps can appear in the supplier or consumer side. Studies on the supplier side have described the green gap as 'green wash', that is, manufacturers often convey distrustful messages to consumers (c.f. Sandeen, 2009). However, Gupta and Ogden (2009) refer to the green gap as the discrepancy between attitudes and behaviors in consuming green products. Most existing studies have presented empirical evidence on the large gap between attitude and behavior related to green purchasing (e.g. Kollmuss and Agyeman, 2002). Nevertheless, consumer behavior intertwined with ethical issues must be understood further to identify effective strategies. Sheu and Chen (2012) emphasize that green marketing is related closely to enterprise performance and government intervention. Sheehan and Atkinson (2012) point out that the attitude-behavior gap complicates green advertising strategies; however, no concrete yet operational suggestion has been offered by existing studies to guide manufacturers that enter the green market.

Consumer rationality in marketing research has become prevalent recently. However, its applications in enterprise strategic management are expected to draw the attention of researchers. Biswas and Grau (2008) support the idea that the framing effect of loss aversion affects the purchasing choice of consumers. Moreover, Ho et al. (2010) confirm the loss aversion effect in institutional behavior via empirical tests for loss-gain and reference-dependent utilities. Borin et al. (2011) further confirm that the framing effect of loss aversion through eco-labeling has a significant effect on the consumer purchase of green products. Given the existence of an attitude-intention gap, Van Dam and De Jonge (2014) observe the phenomenon that the negative signaling of low ethical quality could effectively encourage actual purchase of green products. Heidhues and Köszegi (2008) investigate the effect of loss aversion on the intensity of competition under production cost uncertainty and conclude that loss aversion can alleviate competition based on the Salop model. Wang (2010), Liu et al. (2013) argue that the loss aversion behavior alters the gaming strategy for ordinary decision makers. Deng et al. (2013), Ma et al. (2016) apply consumers'

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