Journal of Business Research xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Journal of Business Research

Giving green a second thought: Modeling the value retention of green products in the secondary market

Kashef Abdul Majid [a,*], Cristel Antonia Russell [b,1]

[a] Mary Washington University, College of Business, 1301 College Ave., Fredericksburg, VA 22401, USA
[b] Kogod School of Business, American University, 4400 Massachusetts Avenue, NW, Washington, DC 20016-8044, USA

ARTICLE INFO

Article history:
Received 11 March 2013
Received in revised form 29 September 2014
Accepted 2 October 2014
Available online xxxx

Keywords:
Green marketing
New products
Brand extensions
Product value
Secondary market

ABSTRACT

Demand for green products continues to grow. This research examines green products' retention of value and whether new green brands differ from green brand extensions in their ability to retain value amidst technological innovations. Modeling of data from the used car market between 2004 and 2011 shows that hybrid (i.e., green) vehicles lose value faster than their non-hybrid counterparts. However, pure green brands (such as the Prius), whose ability to express greenness is more salient, lose value at a slower rate than green brand extensions. Compared with brand extensions, pure green brands are also less vulnerable to the threat of obsolescence from technological innovations (introduction of fully electric vehicles). Implications for the management and marketing of green product offerings to extract maximum value for firms and consumers are discussed and suggestions for future research are proposed.

1. Introduction

To gain a competitive advantage in the marketplace, firms are increasingly creating green products (Lin & Chang, 2012) or adding environmentally friendly attributes to existing products (Olson, 2013). Since the 1960s, environmental issues have gained prominence in business and public policy discourses. Seventy-two percent of Americans believe it is important to buy green products (Green Brands Global Insights, 2011) and 17% of U.S. adults make decisions driven by personal and planetary health, buying green, healthy, and socially-conscious products, with less price sensitivity (Natural Marketing Institute, 2008). Although willing to protect the environment and to purchase green products (Cleveland, Kalamas, & Laroche, 2005, 2012), consumers remain skeptical of the value that green products provide and have not widely embraced them (Devinney, Auger, & Ekhardt, 2010; Polonsky, Vocino, Grau, Garma, & Ferdous, 2012). Consumer reluctance stems from at least three factors: perceived inferiority of green products (Lin & Chang, 2012, Olson, 2013), unwillingness to incur greater costs (Kahn, 2007), and perceived "greenwashing" on the part of firms (Lin & Chang, 2012). In order for firms to capitalize on favorable attitudes toward the environment, they must therefore offer green products that overcome these obstacles.

One way to assess the value of green products in the marketplace is to investigate their ability to retain value in the secondary market, defined as the market for previously used durable goods (Bayus, 1991). Value retention is important to both consumers and firms because it signals brand equity (Aaker, 1996). In theory, green products should retain greater value than non-green equivalent products because they offer cost savings over time through decreased expenditure on energy or waste (Cronin, Smith, Gleim, Ramirez, & Martinez, 2011; Oliver & Lee, 2010). However, the argument for greater value retention ignores the fact that green technology's rapid evolution makes it more susceptible to cannibalization due to technological improvements.

One important decision for firms introducing green products is whether to launch a new brand or extend an established brand (Aaker & Keller, 1990). Compared with a new brand introduction, brand extensions alleviate risk by leveraging positive brand associations to signal positive expectations (Reddy, Holak, & Bhat, 1994; Sullivan, 1998). In the context of green marketing, brand extensions may allow firms to reduce consumers' apprehension against green technology or performance (Kangun, Carlson, & Grove, 1991; Lin & Chang, 2012; Pujari, Wright, & Peattie, 2003) by associating it with an established brand. The drawback of an extension is that it may, by also bringing to mind the non-green version, limit the green brand's ability to establish itself as a green product. By contrast, a new green brand could become a benchmark for that market, as has the Toyota Prius in the automobile sector.

Using the context of the automobile sector, specifically the used car market, we compare the value retention of green and non-green products and distinguish between new and extension green brands. We examine the rate of obsolescence and product depreciation comparing

* Corresponding author. Tel.: +1 540 654 1506.
E-mail addresses: kmajid@umw.edu (K.A. Majid), russell@american.edu (C.A. Russell).
[1] Tel.: +1 202 885 1929.

http://dx.doi.org/10.1016/j.jbusres.2014.10.001
0148-2963/

automobile extensions that contain green technology with those that do not. Defined as the relative loss in value due to changes or improvements (Levinthal & Purohit, 1989), obsolescence in our context is captured by the changes between different versions of the same automobile. Our investigation explores whether automobiles with green technology suffer greater depreciation as a result of obsolescence than their non-green alternatives, and if so, why? We first review the nature of green products to advance testable hypotheses and model the value of green products over time, distinguishing between brand extensions and new brand introductions.

It should be noted that the purpose of this study is to inform firms how best to manage their green product offerings so as to increase consumers' perceived value, not to debate the environmental merits of green products. Whether any product can truly be green is a matter of debate, and some have argued that green products may "greenwash" consumers into believing that a product is environmentally friendly when it is not (Delmas & Burbano, 2011). But because the ways in which firms market green products clearly affect consumers' perceptions of certain products as green (Olson, 2013; Pujari et al., 2003), it is worth investigating how characteristics of green products impact the demand and value retention in the marketplace.

2. Literature review: Green products and the secondary market

Green products may aim to reduce waste (e.g., reusable bags), be less harmful to the environment (e.g., dolphin-friendly tuna), and/or reduce consumption of natural resources (e.g., hybrid cars). Our investigation focuses on the latter category, energy-efficient products. Consumers purchase green products for utilitarian reasons (Hartmann & Apaolaza-Ibanez, 2012) as well as for what they mean (Griskevicius, Tybur, & van den Bergh, 2010). The utilitarian benefits refer to the incremental benefits received relative to non-green alternatives, for example savings accrued from energy efficient light bulbs. If the utilitarian benefits do not exceed the benefits from the non-green alternative, the value of green products declines (Olson, 2013). But products also carry meaning and, in this case, green products can convey environmental values (Pagiaslis & Krontalis, 2014). Environmentally conscious consumers may actively search for unique brands that convey their environmental values and express their green attitudes to others through their purchases (Griskevicius et al., 2010).

Prior work on green product purchases is limited because it focused on early adopters or trendsetters, a small portion of the consumer population willing to pay a premium for novelty. These segments differ from the majority of consumers who delay their purchase or purchase older/used versions (Arkesteijn & Oerlemans, 2005; Porter & Sattler, 1999). Yet, for firms to extract optimal revenues from innovations, they must appeal to a wider consumer base than simply innovators and early adopters (Mahajan, Muller, & Bass, 1995): Firms must appeal to consumers who are less inclined to pay a price premium for a new product (Krishnan, Bass, & Jain, 1999).

To address these limitations, this article assesses green products' value retention in the secondary market. Products inevitably lose value in the market of used durable goods because purchasers assume the risk of purchasing a poor quality, already used product (Akerlof, 1970). But the decreased prices in the secondary market allow more consumers to afford the products. The inclusionary nature of the secondary market therefore makes it possible to explore demand for green products from a broad range of consumers.

3. Research context

Our context is the used car market in the Eastern United States[2] from 2004 to 2011. During this time the auto industry sold over 500,000 new hybrid vehicles in the United States (The Automotive News, 2004–2011). Since the oil crisis in the 1970's, the North American automobile industry has spent considerable amounts of resources to produce a viable energy-efficient technology. Though various technologies were proposed and tested, three have garnered mass commercialization: diesel, hybrid, and electric (Gifford, Adams, Corrigan, & Venkatesan, 1999; Pyper, 2012). At the time of writing, hybrid technology is the dominant eco-friendly technology, although it first had to displace diesel technology and is presently threatened by electrical technology (The Automotive News, 2012–13).

The rapid evolution of green technology in the auto industry allows the identification of green attributes that retain the greatest amount of value in the midst of technological change. Hence, although focused on a single industry, the insights into the attributes of green products that consumers value most can apply to a wide range of technological products. For instance, the home improvement industry promotes energy efficiency by arguing that it enhances homes' resale value.

4. Hypotheses development

Our research focuses on the secondary market for automobiles to assess green products' value retention in the marketplace and compare the value retention of green brand extensions versus new green brands. Specifically, our research attempts to answer the following two questions: 1) Do hybrid (green) vehicles retain more value than non-hybrid (non-green) vehicles? and 2) How do green brand extensions and new green brands differ in their value retention in the marketplace? The first question is linked to the broader issue of green vehicles' sustainability in the marketplace by addressing whether secondary market consumers place greater value on green versus non-green products. The second question distinguishes between brand extensions and new brand introductions: both have advantages and disadvantages when developing new products, but prior research does not provide answers as to which may be best for green products. Identifying whether brand extensions or new brands retain greater value presents an important opportunity because value-retaining features can help offset the higher prices caused by green products' energy saving nature and expected long term savings.

4.1. Green products' value retention

If green products are viewed as investments that offer cost savings over time through decreased expenditure on energy or waste (Cronin et al., 2011; Oliver & Lee, 2010), they should retain greater value compared with alternative products that consume more energy. However, the rapid evolution of green technology may instead increase the rate at which green products lose value: New products provide greater value to consumers because their novelty devalues older products by moving them closer to obsolescence (Hausman, 1996).

As technology evolves so too must products and, in the process, firms are compelled to cannibalize their existing offerings (Chandy & Tellis, 1998). The core functions of products often remain constant through evolving technologies; however, the evolution of the technology changes the design and abilities of the product (Chandy & Tellis, 1998). For example, early notebook computers' 3.5 in. floppy disk drives gave way to CD drives and eventually USB ports. Each new improvement pushes the older version further into obsolescence. Cannibalization is especially likely for green products because the technology that allows these products to conserve energy is vulnerable to a loss in market share from newer versions of the product (Chandy & Tellis, 1998) and/or obsolescence through competing technologies (Sood & Tellis, 2005). For example, in the automobile sector, new versions of previously introduced hybrid vehicles that offer better fuel economy and competing technology, such as electric vehicles, could displace the hybrid vehicle as the market leader (van Bree, Verbong, & Kramer, 2010).

From a consumer perspective, reluctance to adopt green products may also harm their value. The well-established cycle of growth

[2] The Eastern Region consists of the following states: Connecticut, Delaware, D.C, Maryland, New Jersey, Pennsylvania, Virginia, & West Virginia.

Please cite this article as: Majid, K.A., & Russell, C.A., Giving green a second thought: Modeling the value retention of green products in the secondary market, *Journal of Business Research* (2014), http://dx.doi.org/10.1016/j.jbusres.2014.10.001