# Developing Perceived Greenwash Index and Its Effect on Green Brand Equity: A Research on Gas Station Companies in Turkey

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## Abstract

Today, companies are searching for the ways to be perceived as more sensitive to the environment in order to enhance their green brand equity, because of consumers' increasing environmental concern. Companies have reacted to increasing environmental consciousness of consumers by introducing and developing eco-friendly products. However, there are still consumers being suspicious about the environmental performance of companies and their products. Greenwash or disclosure of deceptive green claims decreases the popularity of the real green product and decreases the effectiveness of green marketing.

This study proposed four constructs -greenwashing, green perceived risk, green confusion and green trust- as the predictors of the green brand equity of gas station companies. The study offers a negative relationship between greenwash perception and green brand equity. Besides, the effects of green confusion, green perceived risk and green trust on green brand equity are tested. The study also develops perceived greenwash index, so that it reveals a direct effect of greenwash on green brand equity. The empirical analysis was carried out based on the data obtained from 400 customers of the gas station companies, which are located in Ankara, the capital city of Turkey. The survey result was analyzed by using Partial Least Squares (PLS-PM) analysis method. The results reveal that consumer's greenwash perception has a positive effect on green confusion and green perceived risk, whereas green confusion and green perceived risk have negative effects on green trust. Expectedly, green trust has a positive effect on green brand equity. The result also indicates that consumer's greenwash perception negatively and directly affects green brand equity.

**Keywords:** Greenwash, green brand equity, green consumer confusion, green perceived risk, green trust, gas stations

## 1. Introduction

The numbers of companies considering environmental applications in their practices have been raised rapidly in recent years. This is mostly driven by the changing societal concern and public pressure on having environmentally sound applications. Besides, the numbers of companies misleading consumers about their products and their environmental benefits have also increased in order to respond consumers' demand in the context of green marketing. As a result, a condition emerges as "greenwashing" (Markham et al., 2014). Greenwashing can be defined as misleading information disseminated by an organization to highlight an environmentally responsible public image (Markham et al., 2014). Lyon and Maxwell (2011) define the concept as "declaration of positive information about company's social and environmental performance by hiding negative information in order to present a positive corporate image". It includes some applications of firms such as their environmental claims that are an untruth and unhelpful, suggesting a product is "green" but representing some product attributes without considering other essential environmental issues (Markham et al., 2014). It emerges at both the corporate level and the product level and includes a variety of modes of deceptive communication (Lyon and Montgomery, 2015).

Kalafatis et al. (1999) state that many organizations develop eco-friendly products, but still have the challenge to get over consumer skepticism about the environmental performance of these products and companies' green

attributes. This is an important challenge because several organizations' claims about green features of these products were found to be ambiguous and deceptive. Hence, organizations face the dual challenge, one is to develop eco-friendly products which match if not outperform the functional performance of the conventional product and the second is to create a positive consumer perception on eco-friendly branding applications. The second problem requires to understand researches on green marketing and to focus on constructs such as green brand equity, green trust, greenwash, green satisfaction and so on (Ng et al., 2014).

Consumers want organizations to fulfill their environmental concerns. So, companies have to develop green business actions in their strategies to develop green brand equity. "Integrating green brand equity" into the current business function is so important because it plays a crucial role in business practice. Moreover, successful brands are more likely to enhance competitive advantage (Bulsara and Priya, 2014). A green brand is a comprehensive concept that it expresses its environmental reputation, performance, trustworthy of its environmental claims, its commitments for environmental protection and keeping promises about both environmental issues and protecting the environment (Bulsara and Priya, 2014). Previous studies have examined the predictors of brand equity in general marketing (Aaker, 1992; Yoo et al., 2000). However, the number of studies in the green marketing field is still limited (Bekk et al., 2016). To date, there are only four models of green brand equity and its predictors have been offered (Chen, 2010; Kang and Hur, 2011; Chang and Chen, 2014; Ng et al., 2014).

The researchers have agreed that brand equity can be evaluated in the environmental associations of a brand (Chen, 2010; Bulsara and Priya, 2014; Ng et al, 2014). Yet, the main question is whether the customers perceive green claims of companies as faith and true. If not, the credibility of green marketing will be low (Iyer and Banerjee, 1993) and negative consequences will most probably affect brand evaluations (Bekk et al., 2016). Consumers should analyze whether environmental claims of companies confirm with their level of environmental performance. Consumers may think that companies' claims do not reflect their environmental activity and can perceive their environmental performance poorly. Therefore, perception of the greenwashing applications of companies is so important that it can cause negative outcomes such as confusion and risk perception (Kärnä et al., 2001), mistrust and cynicism of consumer (Parguel et al., 2011) and decrease in brand equity (Bekk et al., 2016).

Bekk et al. (2016) indicate that four models currently investigated the drivers of green brand equity (Chen, 2010; Kang and Hur, 2011; Chang and Chen, 2014; Ng et al., 2014). Nevertheless, three of them only used some of the same constructs and feature distinct predictors to anticipate green brand equity (Bekk et al., 2016). Chang and Chen (2014) offered green brand awareness, green perceived risk and green perceived quality as the predictors of green brand equity, while Chen (2010) evaluated green trust, green brand image, and green satisfaction constructs as the predictors of it. Besides, Ng et al. (2014) stated perceived quality of the brand, green brand perceived value, brand credibility and green brand image as the antecedents of green brand equity. Expectedly, Bekk et al. (2016) suggest that researchers should evaluate negative effects of greenwashing. To our best knowledge, no study focuses on consumers' perception on greenwashing and its effect on green brand equity. More closely, Chen and Chang (2013) focused on greenwash and its outcomes as green trust, green confusion, and green perceived risk. Different from Chen and Chang's (2013) studies, this study adds green brand equity to the research framework as the main objective to increase it. Though previous researchers have explored the issues about greenwash, no study combine its main consequences with brand equity concept. This study considers both the negative outcomes of greenwash (as green confusion and green perceived risk) and their reflections to profitable outcomes for companies as green trust and green brand equity. This study takes the findings of other studies one-step further by examining the greenwashing perception with green brand equity concept. Thus, it presents the way to get a profitable outcome. The study develops a framework that may help companies to enhance their green brand equity via its determinants: greenwash, green perceived risk, green confusion, and green trust. It provides implications for companies to create stronger green trust and green brand equity while diminishing greenwashing actions.

The main contribution of this study is to examine brand equity in the environmental context. The addition of variable of green brand equity and evaluating this construct together with other variables (green consumer confusion, green perceived risk, and green trust) discussed in previous researchers make this study unique and distinguish it with other studies. The study also presents the ways of increasing green brand equity in the oil industry, by focusing on 'greenwashing' concept. Thus, another contribution is to explore these relations in a specific sector, in the oil industry, and to undertake an empirical test. Indeed, green marketing applications become more crucial kinds of products, such as electronic (Chen, 2010) and oil products (Singh et al., 2011; Schweitzer et al., 2014). Sometimes a product characteristic may be unknown and virtually undetermined by

consumer even after purchase and consumers want to trust the company. In this case, companies can tend to lie about the characteristics of the product, causing greenwashing behaviors (Markham et al., 2014). For example Singh et al. (2011) describe oil product as a competitively uniform product. Therefore, gas station companies are more likely to be perceived as environmentally friendly to differ from its competitors. Companies in the oil industry use concepts such as sustainable, green, and renewable, more frequently in their environmental claims (Schweitzer et al., 2014). Accordingly, companies such as British petroleum (BP), Shell, Opet, Petrol Ofisi (PO) and Total are among the companies that indicate their environmental concerns. For instance, Shell frequently declares its commitment to the environment with the raw material acquisition and waste management. Schweitzer et al. (2014) pointed that after 2003 "the mention of energy exceeded the mention of 'oil' and have become mentioned the words "new technologies", "climate change" and "pollution" compared to the word "profit" (Schweitzer et al., 2014). However, it is not always clear what "green" indicate for a gas station company (Schweitzer et al., 2014). More importantly, making a profit by dictating green claims is only be achieved in the case of consumers' positive evaluations about companies' environmental performance. This study is one of the unique studies that evaluate "green brand equity" concept in the context of the oil industry.

Thus, the main question in this study is "Does greenwashing perception influences green brand equity?" The aim is to examine the relationship between greenwashing applications of gas station companies (Shell, Opet, Total, BP and PO) and its relationship with their green brand equity. The effects of green perceived risk, green consumer confusion, and green trust constructs are also estimated to affect green brand equity, in the research model. In addition to testing the research model (shown in Figure 1), the study also develops perceived greenwash index in order to see the direct effect of perceived greenwash on green brand equity.

The next section discusses the definitions of greenwash, green consumer confusion, green perceived risk, green trust, and green brand equity. With this background and taking the greenwash perception as the primary focus, the other constructs as green consumer confusion, green perceived risk, and green trust are estimated to affect green brand equity. The theoretical background is presented for offering the research model, then, information is given about the research method, and the relationships in the model are tested. The research model was analyzed by using variance based partial least squares path modeling (PLS-PM) technique. The method was used both to test the research hypotheses and to develop greenwash index process. Finally, the study concludes with implications for future research.

## 2. Theoretical Background and Hypotheses Development

Green marketing is defined as a broad concept including all marketing activities developed for sustaining environmentally friendly behaviors of consumers (Jain and Kaur, 2004). Companies should consider this issue in their production strategies and product design, whereas consumers evaluate negative environmental effects of products in their purchases. Many previous studies explored the influences of green marketing activities on consumers' green attitudes and behaviors. Some of them offered different segments based on the needs of consumers to develop green marketing mix (Jain and Kaur, 2004; Ay and Ecevit, 2005). Previous studies mainly focused on demographic characteristics of consumers and evaluate them as antecedents of ecological behaviors (Crosby et al., 1981). They used demographic criteria for environmental segmentation (Straughan and Roberts, 1999), tried to understand consumers' environmental consciousness (Ay and Ecevit, 2005) personal and consumption values (Candan and Seda, 2013) and the negative influences of lack of motivation and structural factors on the development of a sustainable behavior (Gelibolu and Madran, 2013).

Some of the researchers -especially in recent years- have developed frameworks with different constructs such as green trust, green brand image, green skepticism, green brand equity, green satisfaction and greenwash (Ng et al., 2014; Lyon and Montgomery, 2015; Bekk et al., 2016). Thanks to the importance of green marketing, this study focuses on the concept of green brand equity and offers a research framework to examine its relationship with its four drivers: greenwashing, green perceived risk, green consumer confusion, and green trust. Thus, the study mainly discusses that greenwashing can decrease companies' intangible brand equity.

### 2.1 The Effect of Greenwash on Green Consumer Confusion

Greenwashing describes the application of a company exaggerating the environmental functionality of its products, which may not be substantiated (Parguel, et al., 2011). Parguel et al. (2011) define the concept as untruthful and deceptive green claims of a company. It indicates the misleading and untruthful claim of a company's products as being sustainable and green while they truly are not. Greenwashing refers to use of environmentally friendly appearance to hide its environmentally unfriendly substance (Du, 2015). Aji (2014) defines the concept as "act of misleading consumer regarding the environmental applications of a company and the product's environmental benefits." Lyon and Maxwell (2011) indicate that most consumers consider

companies' disclosure of green products just as a marketing strategy and they would not trust the green claims. As a result, greenwash can cause consumers to be confused by environmental claims and to be confused by purchasing green products. Greenwash affects market demand negatively and makes consumers doubtful and suspicious about purchasing green products. Therefore, consumers may decide not to buy the green product again (Chen & Chang, 2013). Because greenwash cause confusion, it will be difficult for consumers to assess companies' products (Chen et al., 2014).

When consumers recognize that a company is developing an environmentally friendly product, he can search for the causality of the event. Is this firm leading the way or are competitors taking similar actions? Does this responsibility reflects company's overall approach or is this green behavior limited with only niche era? Consumers try to answer why a company markets environmentally friendly products. Casual explanations, in turn, affect the consumer's doubt about green products (Leonidou and Skarmeas, 2015).

Consumer confusion is defined as a consumer failure to make a correct and true interpretation about different facets of a product. Confused consumers are more ambiguous, more complex and require more information about the product (Turnbull et al., 2000). Chen and Chang (2013) treat green consumer confusion as a consumer failure. Similar to the definition of Turnbull et al. (2000), they define green confusion "as a failure to make a correct interpretation about product's environmental characteristics" (Chen and Chang, 2013). Walsh et al. (2007) claim that greenwash can cause consumers to be overloaded with information and to complicate the evaluation of the product. So, that greenwashing can lead to consumer confusion in the context of green claims (Chen and Chang, 2013; Aji, 2014). Similarly, Polonosky et al. (2010) indicate that misleading claims can cause consumers to be skeptical about green products. Thus, this study discusses that greenwash would influence green consumer confusion positively and offers the following hypothesis:

*Hypothesis (H1):* Greenwash is positively related with green consumer confusion.

### 2.2 The Effect of Greenwash on Green Perceived Risk

Perceived risk is defined as a subjective estimation related with possible outcomes of wrong decisions (Peter and Ryan, 1976) and treated as a subjective consumer behavior concept. Consumers perceive risk when they realize undesirable and uncertain consequences (Mwencha et al., 2014). Since it is affected by ambiguous and uncertain consequences, high risk indicates more uncertainty in purchasing decision (Peter & Ryan, 1976; Mitchell, 1999). Risk perception is expressed to aversively affect consumer and to have a negative influence on behavior (Pavlou, 2003). Since there is a strong relationship between risk perception and negative consumption emotions, greenwash can be said to influence consumer perceived risk (Chen and Chang, 2013).

Thanks to increasing environmental trends, consumers are more conscious about environmental concerns that would increase their risk perception. Green perceived risk is defined as "the expectation of negative environmental outcomes related to purchase behavior" (Chen and Chang, 2013). It is not surprising that consumers can perceive so many claims as just a part of marketing strategy because many companies focus on environmental applications because of its importance. Nevertheless, only a few of them have been successful (Lyon and Montgomery, 2015). This is because they are perceived poorly in their environmental performance. Some companies' environmental products are apparently 'green' which means that they deceive consumers and cause misleading to evaluate the environmental impact of products. By considering misleading and untruthful applications, consumers stop to undertake environmental behaviors (Polonsky et al., 2010). When consumers do not believe the credibility of green claims, greenwash cause risk perception about environmental applications of firms (Gillespie, 2008). Similarly, deceptive claims and misleading green advertising can also lead to the building of risk perception on the product consumed (Chang and Chen, 2014). Thus, this study argues that greenwash would cause green perceived risk and offers the following hypothesis:

*Hypothesis (H2):* Greenwash is positively related to green perceived risk.

### 2.3 The Effect of Green Confusion on Green Trust

Trusting a brand means that there is a high probability for consumers that the brand would be evaluated positively. When evaluating the trust in the context of expectation, a consumer wants to believe that the brand is competent, responsible and honest (Doney and Cannon, 1997). Rousseau et al. (1998) define trust as "a psychological state that comprises the intention to adopt vulnerability based on positive expectations of the intentions". When it comes to green marketing, green trust is defined as the "willingness of consumers to depend on a product of a brand as a result of their beliefs in its environmental benevolence, credibility, and ability" (Cheung et al., 2015). Customer trust is a precondition to establishing a market for green products (Nuttavuthisit and Thogersen, 2015). Green trust comprehends expectations resulted from product's benevolence and

credibility about environmental performance (Chen, 2010). When purchasing products with green claims, many consumers perceive fear because of being cheated (Nuttavuthisit and Thogersen, 2015). So, greenwash can be stated as a barrier to building trust towards green products (Polonsky et al., 2010). Accordingly, greenwash can be a barrier to building green trust towards a brand. When consumers perceive greenwashing behaviors of companies, they will be more likely to feel confused and overwhelmed with corporate social responsibility claims (Parguel et al., 2011) Then, confused consumers do not trust green claims although companies dictate their products are "green" (Lyon and Maxwell, 2011; Chen et al., 2014).

When consumers feel that they are confused, they may delay their purchase decisions and do not trust the company. They delay or abandon their purchase decisions because they feel that they are less likely to make a correct purchase decision (Cho et al., 2006). Consumer confusion may cause negative consequences and one of them is indicated as distrust (Singh and Sirdeshmukh, 2000). Morgan and Hunt (1994) point out that confused consumers have more distrust towards the companies providing them with uncertain and conflicting information about the product. Similar to the relationship between confusion and trust, confusion about companies' environmental claims is negatively related with green trust (Kalafatis and Pollard, 1999). Thus, this study offers the following hypothesis:

*Hypothesis (H3)*: Green consumer confusion is negatively related with green trust.

### 2.4 The Effect of Green Perceived Risk on Green Trust

According to perceived risk theory, consumers tend to decrease their risk perception rather than to maximize the desired outcome (Mitchell, 1999). People have more tendencies to avoid negative aspects rather than to search for positive payoffs. If consumers perceive high risk, they will be more likely to avoid purchasing. Thus, it is not surprising that consumers prefer to purchase a brand with the low-level of perceived risk so that the brand has better brand equity and brand reputation. Therefore, consumers' the low-level risk perception on a brand can lead to more positive evaluations on this brand equity (Mitchell, 1999; Chang and Chen, 2014).

Similar effects can be discussed between perceived risk and trust (Chen and Chang, 2013). Morgan and Hunt (1994) define trust as the willingness of consumers to rely on their beliefs about the future behavior of a firm. In the case that consumers perceive risk in their purchase decision, they will have more willingness to trust the company and look for truthful information. Expectedly, risk perception can be decreased by developing trust, because the rational dimension of trust makes it easy to take risk behavior. On the contrary, when consumers perceive an unambiguous consequence, they may apply risk reduction strategies such as a preference for well-known, truthful brand and seeking for additional -but true- information (Chang and Chen, 2014). Thus, risk perception on companies' performance and their products cause a trust crisis (Guo et al., 2015). Companies, the messages of which are perceived as unproven and misleading are likely to be treated as unreliable. Therefore, consumers will distrust them as well as their products and their communications (Singh and Sirdeshmukh, 2000) and the level of perceived risk will increase, as the level of trust decreases (Chen and Chang, 2013). Based on this relationship between two concepts, this study offers the following hypothesis, in the green context:

*Hypothesis (H4)*: Green perceived risk is negatively related to green trust.

### 2.5 The Effect of Green Trust on Green Brand Equity

Previous studies define brand equity from two perspectives; the value of a brand to the customers from the consumer perspective (Aaker 1992; Keller, 1993); the value of a brand to the firm from the financial perspective (Simon and Sullivan, 1993). Keller (1993) defines the concept of brand equity from the perspective of the individual consumer. He defines the concept as the "differential effect of brand knowledge on consumer response to the marketing of the brand". Customer-based brand equity occurs when the consumer is familiar with the brand and holds strong, favorable and unique brand associations in memory (Keller, 1993). Brand equity is a relative construct because it can only be examined if companies are made with competitive brands (Yoo et al., 2000). Aaker (1991) defines brand equity as "a set of brand liabilities and assets related to a brand, its name or symbol, which add to or subtract from the value provided by a product or service to a firm and to that firm's customers". Focusing on this definition Chen (2010) defines the concept of green brand equity "as a set of brand liabilities and assets about green commitment and environmental concerns that are related to the brand name, and symbol that can either evaluate or decrease the value given by the eco-friendly goods and services".

Compared to brand equity, green brand equity is much more difficult to manage because of the rise of consumer environmentalism and international environmental regulations (Chang and Chen, 2014). Enhancing green brand equity helps companies to take the advantage of competitions by positioning and marketing differently (Ng et al., 2014). Positive customer based brand equity may lead to more revenue, less cost, and greater profits. Customer

based brand equity can provide the approach that will enable companies to take better long-term and short-term marketing actions (Keller, 1993). In order to manage the brand successfully, understanding customer based brand equity is important because the content of memory for the brand will affect the future effectiveness of brand strategies (Keller, 1993). Nevertheless, companies' greenwashing behaviors cause a crisis of trust (Guo et al., 2015) which, in turn, may affect brand equity.

Brand trust is one of the most important variables for increasing brand equity and it is indicated as positively related with it (Morgan and Hunt, 1994). Similarly, customer trust is declared to positively affect brand equity (Kim et al., 2008). Thus, a relationship can be offered between green trust and green brand equity (Chen, 2010). Based on previous literature this study proposes the following hypothesis:

*Hypothesis (H5)*: Green trust is positively related to green brand equity.

Green marketing or environmental marketing needs new marketing strategies which can successfully address key issues relating to 'how companies develop and market green products satisfying customer needs, how they define green and how they communicate their commitments with credibility' (Ottman 1993). This study predicts the negative relationship between greenwash and green brand equity and evaluates the effects of green perceived risk, green consumer confusion, and green trust. The research model is presented in Figure 1.
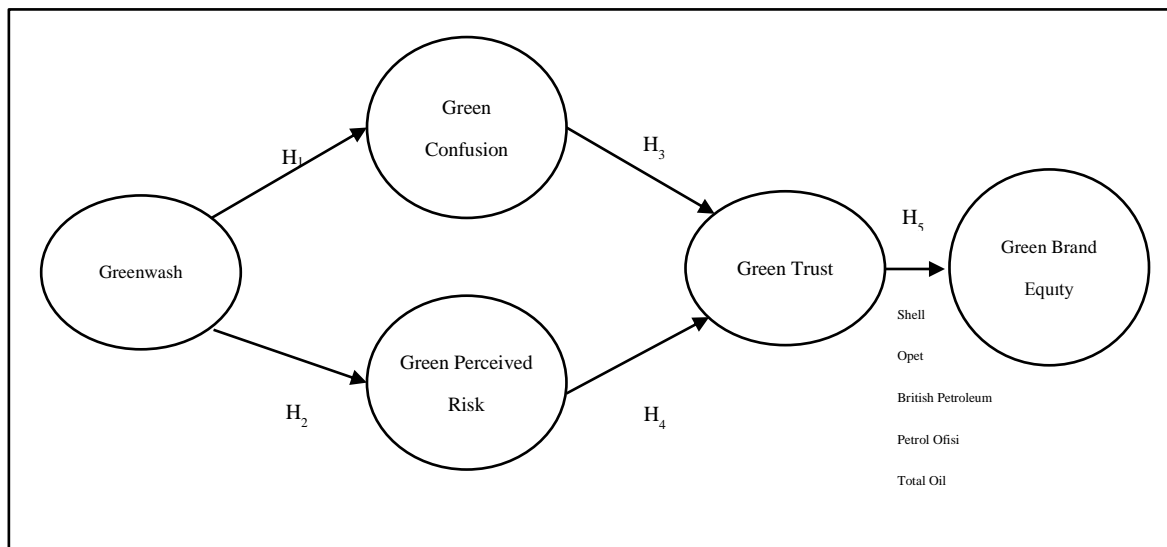


Figure 1. Research Model

## 3. Research Method

### 3.1 Data Collection and Sample

This study investigates customers who have been purchasing gasoline product from one of the five gasoline stations: Shell, Opet, British Petroleum, Petrol Ofisi and Total. The empirical analysis was performed based on the data obtained from customers of these gas stations, which are located in Ankara, the capital city of Turkey. Face to face survey method was used to obtain data for our empirical research. The sample includes 400 customers who have the experience of purchasing gasoline from one of the five gas stations. In order to meet these preconditions, we used the purposive sampling (a nonprobability sampling method) technique in the study. Thus, the research covers customers who have purchasing experience at least one of the five gasoline stations.

Respondents were wanted to select one out of the five presented well-known brands (Shell, Opet, BP, PO and Total) for which they had regularly gasoline buying experience. Afterward, respondents were shown selected gas station printed advertising which contains environmental advertising message, such as an unleaded gasoline for nature, the cleanest diesel fuel in the world, superior environmental protection, the awareness of the environmental responsibility and higher performance and more environmentally friendly. Subsequently, the selected gas station and advertisings were evaluated based on the constructs of greenwash perception, green confusion, green perceived risk, green trust, and green brand equity. Moreover, respondents rated the perceived green brand equity of the selected gas station.

Selected gas stations have branches throughout Turkey and market share of each of them is bigger than 5%.

Besides, they are the five large extended gas stations with 85% of total market share in Turkey. All these are the criteria to select these gas stations (Shell, Opet, BP, PO and Total). Respondents were selected among consumers living in Ankara and regularly buying fuel from one of the five stations.

### 3.2. Measures and Variables

This study used the measurement scale of previous studies in order to design questionnaire items. Questionnaire items were measured by seven-point Likert scale from 1 to 7, rating from strongly disagreement to strongly agreement. This study offered five constructs as greenwash, green consumer confusion, green perceived risk, green trust and green brand equity. Measurement of consumers' perception on greenwashing applications of companies includes five items adopted from Chen and Chang (2013). This study refers to Chen and Chang (2013) and Aji (2014) to measure green consumer confusion including five items. Green perceived risk was measured by using five items adopted from the work of Chen and Chang, (2013). The questionnaire items for green trust and green brand equity (based on consumer perspective) were adopted from Chen (2010). The measurement includes five items for green trust and four for green brand equity. Lastly, three items were added in the stage of developing greenwash index (as shown in Table 5 and Figure 2). These tree additional items, indicating overall greenwash perception (OGWP), were also measured by using seven-point Likert scale. These items were indicated as "this printed advertising contains untruthful green claims (OGWP1)", "this printed advertising is completely deceptive (OGWP2)" and "this printed advertising is completely misleading (OGWP3)". Table 1 shows the items used for measurements of the constructs.

Table 1. Measurements of Constructs

| | *Items* | *References* |
|---|---|---|
| *Greenwashing* | | |
| GW1 | This ad misleads with words in its environmental features. | |
| GW2 | This ad misleads with visuals or graphics in its environmental features. | Chen and |
| GW3 | This ad possesses a green claim that is vague or seemingly un-provable. | Chang |
| GW4 | This ad overstates or exaggerates how its green functionality actually is. | (2013) |
| GW5 | This ad leaves out or masks important information, making the green claim sound better than it is. | |
| *Green Consumer Confusion* | | |
| GCC1 | It is difficult to detect this product in terms of environmental features. | Chen and |
| GCC2 | It is difficult to recognize the differences among products with respect to environmental features | Chan |
| GCC3 | I confuse to decide which green products should be purchased | (2013); |
| GCC4 | I rarely feel sufficiently informed about environmental features of this product. | Aji (2014) |
| GCC5 | I feel uncertain about environmental features of this product. | |
| *Green Perceived Risk* | | |
| GPR1 | There is a chance that there will be something wrong with the environmental performance of this product. | |
| GPR2 | There is a chance that using this product will negatively affect the environment. | Chen and |
| GPR3 | Using this product would damage my green reputation or image. | Chang |
| GPR4 | There is a chance that I would get an environmental penalty or loss If I use this product. | (2013) |
| GPR5 | There is a chance that this product will not work properly with respect to its environmental design. | |
| *Green Trust* | | |
| GT1 | I feel that this brand's environmental commitments are generally reliable. | |
| GT2 | I feel that this brand's environmental performance is generally dependable. | Chen |
| GT3 | I feel that this brand's environmental argument is generally trustworthy. | (2010) |
| GT4 | This brand's environmental concern meets your expectations | |
| GT5 | This brand keeps promises and commitments for environmental protection. | |
| *Green Brand Equity* | | |
| GBE1 | It makes sense to buy from this station instead of other stations because of its environmental commitments, even if they are the same. | |
| GBE2 | Even if another station has the same environmental features as this station, I would prefer to buy from this station. | Chen |
| GBE3 | If there is another station's environmental performance as good as this station, I prefer to buy from this station. | (2010) |
| GBE4 | If the environmental concern of another station is not different from that of this station in any way, it seems smarter to purchase from this station. | |

### 3.3 Data Analysis

The research model was analyzed by using variance based partial least squares path modeling (PLS-PM) technique. PLS-PM is a variance-based structural equation modeling analysis method to test theoretical relations between latent variables (Willaby, et al. 2015). PLS-PM maximizes the explained variance of dependent latent variables by predicting partial model relationships in an iterative sequence of ordinary least squares regressions. Besides, PLS-PM emphasizes prediction while simultaneously relaxes the demands on data and specification of

relationships (Hair et al., 2016). The estimation of PLS path model is conducted in four steps. Firstly, an iterative algorithm determining composite scores for each construct is performed. Then, corrections for attenuation for those modeled constructs are made. Thirdly, parameter estimation is made and finally, bootstrapping for inference testing is performed (Henseler et al. 2016). PLS-PM has some advantages over other SEM technique. For instance, PLS-PM analysis works more efficiently with a) complex theoretical models, b) small sample size, c) variable prediction goal, d) non-normal data distributions and it uses e) both reflective and formative constructs (Willaby et al., 2015; Henseler et al., 2009). On the other hand, in the literature, PLS-PM analysis method is generally criticized as four main headings. It is criticized as producing biased parameter estimates, offering no model over identification tests, not correcting for endogeneity in predictors and not accommodating measurement error (e.g. Rönkkö et al., 2015; McIntosh et al., 2014; Rönkkö and Evermann, 2013). PLS-PM analysis was used both to test the research hypotheses and to develop greenwash index process. During the analyses process, SmartPLS 3 (Version 3.2.4) software (Ringle et al., 2015) was used to evaluate the measurement and structural model.

Table 2. Demographic Profiles and Gasoline Purchase Behavior of the Sample

| Gender | Frequency | Percentage | Monthly Average Income | Frequency | Percentage |
|---|---|---|---|---|---|
| Male | 280 | 70 | Under 1,000 TL | 5 | 1.3 |
| Female | 120 | 30 | 1,001-3,000 TL | 18 | 4.5 |
| Age | Frequency | Percentage | 3,001- 5,000 TL | 121 | 30.3 |
| 18-25 | 71 | 17.7 | 5,001-7,000 TL | 181 | 45.3 |
| 26-33 | 103 | 25.8 | 7,001-9,000 TL | 65 | 16.3 |
| 34-41 | 143 | 35.8 | 9,001 TL and over | 10 | 2.5 |
| 42-49 | 54 | 13.5 | Used Fuel Type | Frequency | Percentage |
| 50 and over | 29 | 7.2 | Gasoline | 92 | 23.0 |
| Marital Status | Frequency | Percentage | Diesel | 130 | 32.5 |
| Married | 274 | 68.5 | Liquid Petroleum Gas (LPG) | 178 | 44.5 |
| Single | 126 | 31.5 | Preferred Gas Station | Frequency | Percentage |
| Educational Level | Frequency | Percentage | Petrol Ofisi | 80 | 20.0 |
| Elementary education | 52 | 13.0 | Opet | 78 | 19.5 |
| Secondary education | 45 | 11.3 | Shell | 83 | 20.8 |
| Vocational school | 114 | 28.5 | BP | 79 | 19.8 |
| Undergraduate | 147 | 36.8 | Total Oil | 80 | 20.0 |
| Postgraduate | 42 | 10.5 | Monthly Average Mileage | Frequency | Percentage |
| Occupation | Frequency | Percentage | Less than 1,000 km | 23 | 5.8 |
| Government official | 81 | 20.3 | 1,001-2,000 km | 306 | 76.5 |
| Worker | 62 | 15.5 | 2,001-3,000 km | 53 | 13.3 |
| Tradesman | 54 | 13.5 | More than 3,001 km | 18 | 4.5 |
| Self-employed | 41 | 10.3 | Monthly Fuel Purchasing Frequency | Frequency | Percentage |
| Business Manager | 32 | 8.0 | 1 | 45 | 11.3 |
| Teacher | 32 | 8.0 | 2 | 101 | 25.2 |
| Academician | 24 | 6.0 | 3 | 157 | 39.2 |
| Doctor | 19 | 4.8 | 4 | 57 | 14.3 |
| Engineer | 15 | 3.8 | 5 and over | 40 | 10.0 |
| Farmer | 12 | 3.0 | Monthly Ave. Cons. of Fuel (liters) | Frequency | Percentage |
| Student | 10 | 2.5 | 0-40 | 118 | 29.5 |
| Housewife | 8 | 2.0 | 41-80 | 151 | 37.8 |
| Other | 10 | 2.5 | 81 and over | 131 | 32.8 |

## 4. Results

### 4.1 Demographic Profiles of the Respondents

The 400 valid questionnaires were collected from the respondents. The demographic profile of the respondents is presented in Table 2. Among the respondents 70% of them were male, more than two-thirds of the respondents (68%) were married and almost two-thirds of the respondents (62%) indicated their age as 26-41. Among the survey respondents, nearly 37% of them reported that they had completed an undergraduate level of education. In terms of occupation, 20% of the respondents indicated their occupation as a government official, nearly 16% of the respondents reported their occupation as a worker and 14% of the respondents indicated their occupation as a tradesman. Among the survey respondents, the majority of those (75%) indicated their average monthly income level between 3,001-7,000 Turkish Liras. In terms of used fuel type in their cars, the majority of the respondents (45%) stated that they used liquid petroleum gas (LPG), nearly 32% of the respondents indicated that they used diesel and the remainder of the respondents (23%) indicated that they used gasoline. The majority of the respondents (76%) reported the monthly average distance traveled by their cars as 1.001- 2.000 kilometers.

According to the survey, more than two-thirds of the respondents (64%) indicated their monthly fuel purchasing frequency as 2-3 times. Finally, when the participants were asked how many liters fuel they consume per month, nearly 38% of them reported that they had consumed 41-80 liters fuel, while 33% of them indicated the amount as more than 81 liters fuel and 29% of the respondents reported the amount as less than 40-liters fuel.

## 4.2 Reflective Measurement Model Assessment

The first step in the PLS analysis is the assessment of the measurement (outer) model. PLS-Path Models consist of two sets of linear equations, one is the outer model and the other is the inner model. The outer model indicates the relationships between a latent variable and it's observed or manifests variables, whereas the inner model specifies the relationships between unobserved or latent variables (Henseller et al., 2009). Thus, reliable and valid outer model estimations permit us an evaluation of inner path model estimates. In order to evaluate the psychometric properties of the reflective measurement model, this study followed the procedure offered by Hair et al. (2014) in the PLS-PM analysis process. Unidimensionality, convergent and discriminant validity, composite reliability and average variance extracted (AVE) indices were evaluated for the outer models.

Reflective measurement constructs should be homogenous and unidimensional (Esposito Vinzi et al., 2010: 50). In order to assess measurement constructs' unidimensionality, principal component analysis (PCA) with varimax rotation was conducted by using PASW Statistics Software (version 18) for each of the five latent constructs. For all five constructs, unidimensionality was evidenced as the first eigenvalue ($\lambda > 1$) of the variables exceeded one and the second eigenvalue ($\lambda < 1$) was smaller than one. Principal component analysis result indicates that all of the constructs in the research model are unidimensional. Table 3 presents the descriptive statistics and correlations for latent variables.

Table 3. Descriptive Statistics and Correlations for Latent Variables

| Reflective Constructs | Mean | SD | Outer Loadings (max-min)* | AVE | Cronbach's Alpha | Composite Reliability | GW | GCC | GPR | GT | GBE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Perceived Greenwashing (5 items) | 3.420 | 1.397 | 0.914-0.899 | 0.801 | 0.938 | 0.953 | *(0.895)* | | | | |
| Green Consumer Confusion (5 items) | 4.302 | 1.533 | 0.933-0.875 | 0.843 | 0.953 | 0.946 | 0.291 | *(0.918)* | | | |
| Green Perceived Risk (5 items) | 3.575 | 1.532 | 0.917-0.890 | 0.821 | 0.927 | 0.948 | 0.762 | 0.401 | *(0.906)* | | |
| Green Trust (5 items) | 5.282 | 0.977 | 0.849-0.789 | 0.720 | 0.919 | 0.935 | -0.513 | -0.308 | -0.391 | *(0.848)* | |
| Green Brand Equity (4 items) | 5.317 | 1.262 | 0.935-0.923 | 0.867 | 0.949 | 0.963 | -0.435 | -0.214 | -0.467 | 0.356 | *(0.931)* |

**\***Reflective measurement model factor loadings are statistically significant at (p<0.001);

Diagonal elements (values in parentheses) are the square root of the AVE; the off-diagonal values are the correlations between the latent constructs. As indicated in Table 3, all the outer loadings of the reflective constructs are statistically significant (p<0.001) and above the minimum threshold value of 0.70. PLS-PM analysis results indicate that within-method convergent validity is evidenced by the large (>.708) and statistically significant outer loadings on their respective constructs. Composite reliability values (see CR column in Table 3) for all the reflective constructs have high levels of (0.93; 0.96) internal consistency reliability. Moreover, the values of AVE (convergent validity) are above the minimum recommended level of 0.50. This indicates the convergent validity for all constructs. Cronbach's alpha coefficients, indicating internal consistency, are above the recommended level of 0.70. As shown in Table 3, PLS-PM analysis results indicate that all reflective constructs have high-level internal consistency reliability. Finally, Fornell and Larcker (1981) criterion is used in order to assess discriminant validity. According to this criterion, the square root of the AVE of each construct should be higher than the constructs' correlation in the model. PLS-PM analysis result points out that all the square root of the AVE values is higher than the correlations of constructs in the research model. The analysis result supports reflective measurement constructs' discriminant validity. Overall, PLS-PM analysis results provide support for the general quality of the reflective constructs and analysis results imply that our data and measurement model are suitable for structural model assessment and hypothesis testing process.

## 4.3 Structural Model Assessment

The measurement model has been confirmed as reliable and valid, in the first step. The next step is assessing the results of the structural model, which involve model predictive capabilities and the relationships between latent variables. The main criteria to evaluate the structural model in PLS-PM are the significance of path coefficients,

the level of endogenous latent variables' $R^2$ values, and the predictive relevance ($Q^2$) values (Hair et al., 2014).

The evaluations of the structural research model base on the bootstrapping and blindfolding procedure (Hair et al., 2014). After managing the PLS-PM algorithm, the path coefficient estimates were obtained for the structural model relationships, which represent the hypothesized relationships between the latent constructs. The statistical significance levels of path coefficients were estimated by means of bootstrapping routine (5.000 subsample and 400 bootstrap cases). Besides, in order to assess the models' predictive relevance, Stone-Geisser's $Q^2$ values were also received via the blindfolding procedure. Table 4 shows the results of the structural relationship path coefficients, standard deviations for path coefficients, t-statistic values, p-values, and hypotheses test results.

As seen in Table 4, PLS-SEM analysis result indicates that the structural path linking perceived greenwash to the green confusion is positive and statistically significant (β=.292; SD=.074; p<0.001). This result empirically supports Hypothesis 1, indicating perception of greenwash is positively related to green confusion. Therefore, there is evidence that a higher level of greenwash perception can lead to higher level consumer confusion in the context of gas stations' green advertising claims. Misleading green product advertising claims with words, visuals, and graphics can cause consumers to be more confused about the gas station and environmental features of its product. In addition, the structural path that links perceived greenwashing level and perceived green risk is found positive and statistically significant (β=.617; SD=.069; p<0.001). This result empirically supports Hypothesis 2, indicating that the greenwashing level is positively related to perceived green risk. That is, a higher level of greenwashing perception can cause a higher-level consumer risk perception in the context of gas stations' green advertising claims. Moreover, the results reveal that the influence of the greenwashing perception on the perceived risk dimension is higher than its influence on the dimension of green confusion. According to PLS-PM analysis results, the structural path linking green consumer confusion and green trust is negative and statistically significant (β= -.308; SD=.072; p<0.001). This result supports Hypothesis 3. Therefore, when the consumer has a higher level confusion about the gas station and environmental features of its product, their trust level toward the gas station may decrease. In other words, consumers at a high-level mental confusion have more distrust towards the gas station and its environmental claims. Similarly, analysis result reveals that the relationship between green risk and green trust is negative and statistically significant (β= -.415; SD=.061; p<0.001), supporting Hypothesis 4. That means when the consumer has a higher-level risk perception about the gas station and environmental features of its fuels, their trust level toward the gas station may decrease. The results also reveal that negative influence of green perceived risk on green trust dimension is higher than the influence of green confusion on green trust. That is green perceived risk has a higher level negative effect on green trust, compared to green confusion. Finally, PLS-SEM analysis result indicates that the structural path that links green trust and green brand equity is positive and statistically significant (β= .312; SD=.063; p<0.001), supporting Hypothesis 5, which indicates that green trust level is positively related to green brand equity. Therefore, the result shows that a higher level of green trust towards the gas station brand and its environmental claims can lead to a more positive perception of green brand equity.

Table 4. PLS Structural Model Analysis Results and Hypotheses Testing

| | Path Coefficient | SD | T-Statistic* | p-Value | Hypothesis | Proposed Effect Sign | Decision |
|---|---|---|---|---|---|---|---|
| Perceived Greenwash --> Consumer Green Confusion | 0.292 | 0.074 | 3.945 | 0.000 | H$_1$ | + | Supported |
| Perceived Greenwash - -> Green Perceived Risk | 0.617 | 0.069 | 8.942 | 0.000 | H$_2$ | + | Supported |
| Green Consumer Confusion --> Green Trust | -0.308 | 0.072 | -4.277 | 0.000 | H$_3$ | - | Supported |
| Green Perceived Risk --> Green Trust | -0.415 | 0.061 | -6.803 | 0.000 | H$_4$ | - | Supported |
| Green Trust --> Green Brand Equity | 0.312 | 0.063 | 4.952 | 0.000 | H$_5$ | + | Supported |

Note: *T-Statistic values for two-tailed test: 1.96 (sig. level 5%), and 2.58 (sig. level 1%).

In order to examine the predictive accuracy and predictive relevance of the models, $R^2$ (coefficient of determination) and Stone-Geisser's $Q^2$ values were also obtained by using the PLS algorithm procedure. As the endogenous latent construct, the $R^2$ value for green brand equity was calculated as 0.658 with a Stone-Geisser's $Q^2$ value of 0.574, indicating a large effect size. Therefore, PLS-PM analysis results reveal that the research model fits the data well.

*4.4 Greenwash Index Development*

Gas station companies (e.g. BP, Shell, Opet etc.) have been recently using advertising in order to attach a green climate to their products and brands. These companies can mask or ignore the environmental issues involved in the production, processing, and shipment of products. In this context, developing a consumer based (e.g. perceptual) greenwash index and determining the effect of this index value on green brand equity is a very important research topic in terms of both advertising practitioners and green consumers.

Arnett et al., (2003) defined an index as "a value assigned to people that represents the degree to which they possess some latent trait" (Arnett et al., 2003). An index's construction requires the use of formative rather than reflective indicators (Diamantopoulos and Winklhofer, 2001). When a latent construct is measured by using formative indicators the observed indicators cause the latent construct. In contrast, when reflective indicators are used the latent construct causes the observed indicators. That is, the observed variables reflect the changes in the latent constructs (Arnett et al., 2003). The method for developing consumer perceived greenwash index (multi-item formative indicators) is based on the studies of Diamantopoulos and Winklhofer (2001), Arnett et al. (2003) and Wang et al. (2011). Diamantopoulos and Winklhofer (2001) state that four issues are critical for successful index constructions. These issues are indicated as content specification, indicator specification, indicator collinearity and external validity. The first issue in index construction is the content specification. The content specification is the domain of content which the index is intended to capture the entire scope of the latent variable. After the content specification, researchers must determine the indicators that constitute the index. Including comprehensive indicators is more important in a formatively multi-item index construction process (Diamantopoulos and Winklhofer, 2001; Wang et al., 2011). The main construct for which we seek to generate a greenwash index is the consumer perceptions of misleading green claims in the gas stations' printed advertising. In the index construction process, this study used five item scales (see in Table 5) adopted from Chen and Chang (2013) containing five separate facets of greenwashing application.

Another issue in the index construction process is the indicator collinearity. Since the formative measurement model is based on multiple regression, researchers must examine the issue of multi-collinearity between formative indicators (Diamantopoulos and Winklhofer, 2001). High levels of multi-collinearity between formative indicators are a crucial issue because they have an impact on the estimation of weights and their statistical significance. In PLS-SEM analysis, the multi-collinearity issue is especially problematic, because standard errors are generally larger due to sampling error (Hair et al., 2014). Therefore, inter-correlations among the formative indicators were assessed using variance inflation factor (VIF) values generated by PLS-PM analysis process. In the context of PLS-PM analysis, a VIF value of 5 and higher indicates a potential collinearity problem (Hair et al., 2014). According to the PLS-PM analysis result in Table 5, GW1 indicator has the highest level of VIF value (1.875). Thus, VIF values of formative indicators are uniformly below the threshold value of 3.33. Therefore, it can be concluded that collinearity does not reach critical levels in any of the five formative indicators (see Table 5) and is not an issue for the index construction process.

Table 5. PLS Analysis Results - Formative Indicators VIF Values

| Perceived Greenwash Index | |
| --- | --- |
| *Formative Indicators* | *VIF<3.33* |
| GW1: This ad misleads with words in its environmental features -> Perceived greenwash index | 1.875 |
| GW2: This ad misleads with visuals or graphics in its environmental features -> Perceived greenwash index | 1.773 |
| GW3: This ad possesses a green claim that is vague or seemingly un-provable -> Perceived greenwash index | 1.589 |
| GW4: This ad overstates or exaggerates how its green functionality actually is -> Perceived greenwash index | 1.868 |
| GW5: This ad leaves out or masks important information, making the green claim sound better than it is -> Perceived greenwash index | 1.832 |

According to Diamantopoulos and Winklhofer (2001), the final step to construct index is to evaluate the external validity and indicator inspection. External validity is important for index development. Two possible ways of measuring the external validity of an index may include (1) using multiple indicators and multiple causes (MIMIC) model and (2) evaluating how well the proposed index relates to another construct (green brand equity) that theory suggests there should be a negative relationship between the two constructs.

In this study, we used MIMIC model (see Figure 2) for evaluating external validity. In the MIMIC model, the construct of interest is measured both formatively and reflectively (Arnett et al., 2003). Five indicators (see Table 5) derived from previous studies were used as formative indicators for the greenwash index. Three additional global indicators were used as reflective indicators in the MIMIC model. These global reflective indicators include the items as (1) this printed advertising contains untruthful green claims, (2) this printed advertising is completely deceptive, and, (3) this printed advertising is completely misleading.
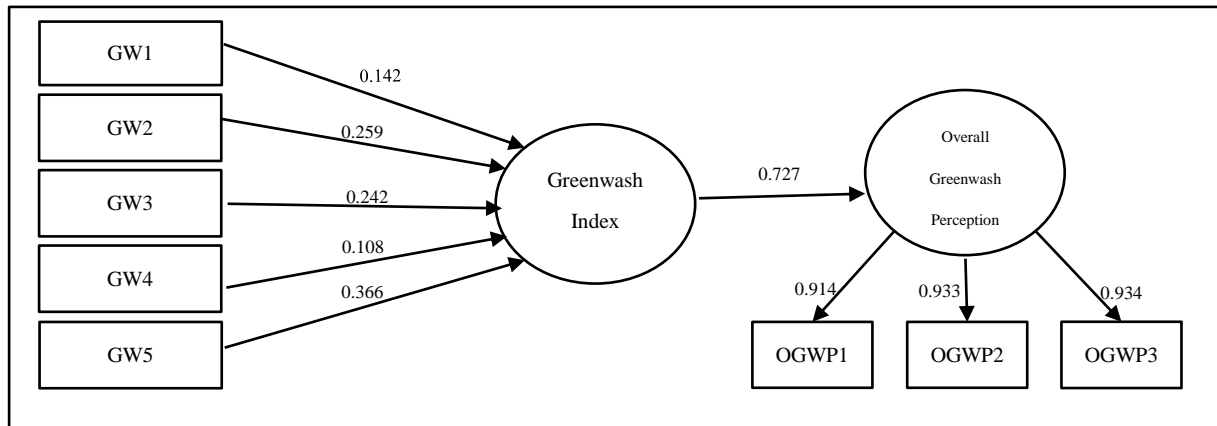
Figure 2. PLS-PM MIMIC Model Analysis Results

In order to test the MIMIC model, PLS-PM analysis was used. Figure 2 shows the MIMIC model analysis results. According to these results, consumer perceived greenwash index explains the large portion of variance ($R^2=$ 0.775) in the reflectively measured overall greenwash perception. Also, Stone-Geisser's value ($Q^2=0.778$), which indicates MIMIC model fits the data well. The path coefficient from greenwash index to reflectively measured greenwash perception is positive ($\beta=0.727$) and standard error is low (SE=0.01). Therefore, the five indicators sufficiently capture the content domain of the latent variable (e.g. the five facets of greenwashing).

The second method to evaluate the external validity of an index is to examine how well the proposed index relates to another construct (Diamantopoulos and Winklhofer 2001). Thus, in order to assess external validity of the greenwash index, this study followed stated method, the perceived greenwash index is assessed by examining how the index relates to another construct (green brand equity) that theory suggests there should be a negative relationship between the two constructs. The model (see Figure 3) is estimated via PLS-PM analysis method. In the model, perceived greenwash index is modeled as an antecedent of perceived green brand equity construct. The model again was re-tested with the data from consumers buying fuel from five different gas stations. The analysis results are presented in Table 6.
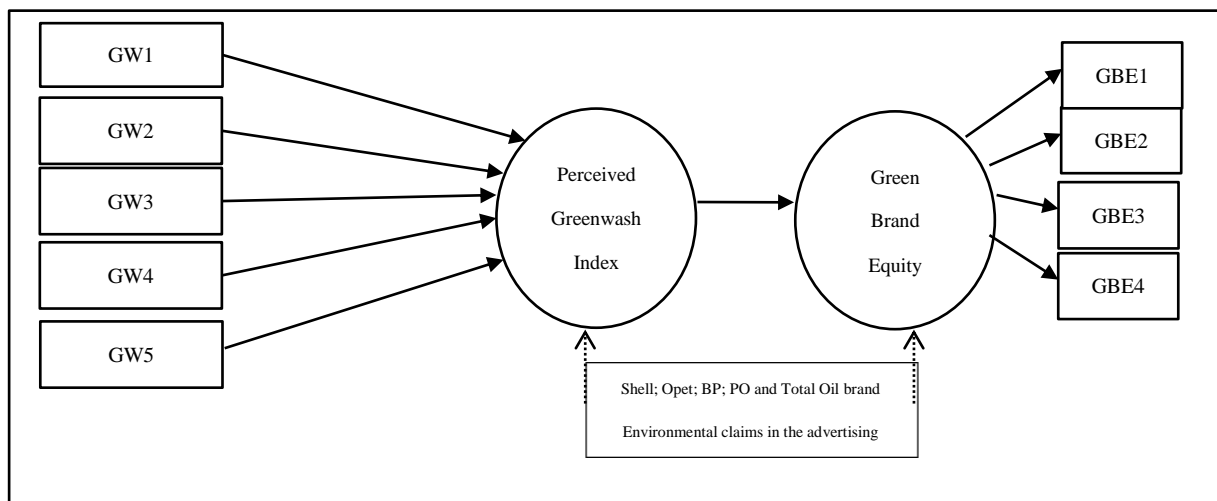


Figure 3. The Effect of Greenwash Index on Green Brand Equity

Table 6. PLS Analysis Results - The Effect of Greenwash Index on Green Brand Equity

| Perceived Greenwash Index | | |
| --- | --- | --- |
| *Formative indicators* | VIF | *Weights (standard error)[a]* |
| GW1: This ad misleads with words in its environmental features -> Perceived greenwash index | 1.875 | 0.239 (0.023) |
| GW2: This ad misleads with visuals or graphics in its environmental features -> Perceived greenwash index | 1.773 | 0.277 (0.018) |
| GW3: This ad possesses a green claim that is vague or seemingly un-provable -> Perceived greenwash index | 1.589 | 0.147 (0.021) |
| GW4: This ad overstates or exaggerates how its green functionality actually is -> Perceived greenwash index | 1.868 | 0.271 (0.026) |
| GW5: This ad leaves out or masks important information, making the green claim sound better than it is -> Perceived greenwash index | 1.832 | 0.479 (0.024) |

| Green Brand Equity | | |
| --- | --- | --- |
| *Reflective indicators, internal reliability=0.949 and (AVE=0.823)* | VIF | *Loadings (standard error)[a]* |
| *Green Brand Equity -> Y1* (It makes sense to buy from this station instead of other stations because of its environmental commitments, even if they are the same) | 2.701 | 0.947 (0.019) |
| *Green Brand Equity -> Y2* (Even if another station has the same environmental features as this station, I would prefer to buy from this station) | 1.918 | 0.904 (0.015) |
| *Green Brand Equity -> Y3* (If there is another station's environmental performance as good as this station, I prefer to buy from this station) | 2.715 | 0.905 (0.019) |
| *Green Brand Equity -> Y4* (If the environmental concern of another station is not different from that of this station in any way, it seems smarter to purchase from this station. | 2.901 | 0.871 (0.014) |

| *Structural Path* | *Loadings (standard error)* | $R^2$ | $Q^2$ |
| --- | --- | --- | --- |
| *Perceived greenwash index -> Green Brand Equity (Reflective)* | -0.445 (0.040) | 0.206 | 0.419 |

[a] Standard error values are estimated using the bootstrap procedure. All weights and loadings are statistically significant at $p < 0.05$.

For comparison purpose, the means and standard deviations for the greenwashing indicators as well as the greenwash indexes and perceived green brand equity values for each gas station are given in Table 7.

Table 7. Greenwash Index and Formative Indicators' Means and Standard Deviations

| | Shell (n=83) | | Opet (n=78) | | BP (n=79) | | PO (n=80) | | Total Oil (n=80) | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Formative Indicators[*]* | *Mean* | *SD* | *Mean* | *SD* | *Mean* | *SD* | *Mean* | *SD* | *Mean* | *SD* |
| GW1 | 3.181 | 1.631 | 2.410 | 1.121 | 3.797 | 1.488 | 3.163 | 1.569 | 3.863 | 1.456 |
| GW2 | 3.289 | 1.534 | 2.218 | 1.158 | 3.468 | 1.518 | 3.463 | 1.474 | 3.938 | 1.256 |
| GW3 | 3.506 | 1.648 | 2.718 | 0.938 | 3.494 | 1.535 | 3.463 | 1.717 | 4.113 | 1.263 |
| GW4 | 3.482 | 1.670 | 2.449 | 1.169 | 3.785 | 1.638 | 3.625 | 1.770 | 4.188 | 1.323 |
| GW5 | 3.530 | 1.618 | 2.602 | 1.097 | 3.949 | 1.518 | 3.413 | 1.841 | 4.413 | 1.338 |
| *Greenwash Index* | *3.490* | *1.554* | *2.807* | *1.290* | *3.536* | *1.426* | *3.453* | *1.535* | *4.842* | *2.507* |
| *Green Brand Equity* | *5.568* | *1.082* | *5.955* | *1.198* | *4.389* | *1.327* | *5.713* | *1.083* | *4.954* | *0.944* |

[*] All indicators are measured on 7-point scales. Greenwash index is based on the five formative indicators (GW1, GW2, GW3, GW4, and GW5) for each gas station brand.

PLS-PM analysis results reveal that while Total Oil has the highest-level perceived greenwash index value (Total Oil greenwash index value=4.482; SD=2.507), Opet has the lowest-level greenwash index value (Opet greenwash index value=2.807; SD=1.290). In addition, analysis results show that "green advertising leaves out or masks important environmental information" and "green advertising overstates or exaggerates how its green functionality actually is" variables (e.g. greenwashing advertising applications) affect consumer's greenwashing perceptions at the highest level. Moreover, analysis results indicate that Opet has the highest-level perceived green brand equity, while BP has the lowest-level perceived green brand equity. Finally, analysis results reveal that Opet has the highest-level green brand equity and the lowest-level perceived greenwash index value.

## 5. Conclusion

This study predicts the effect of consumers' greenwash perception on green brand equity, in the context of gas station companies. Research model includes a variety of factors apart from greenwash, such as green consumer confusion, green perceived risk and green trust and these all have been estimated to affect green brand equity of gas station companies. The study results in the acceptance of all hypotheses in the research model. Greenwash perception is found to have effects on green confusion and green perceived risk, whereas green confusion and

green perceived risk have influences on green trust towards gas station companies. Lastly, green trust is found to have a significant and positive effect on green brand equity. Especially, the highest influence among constructs proposes the strong influence of greenwash perception on green perceived risk.

Firstly, greenwash perception has a positive effect on both green consumer confusion and green perceived risk. That is, when consumers have more greenwash perception, they will be more likely to perceive risk and be confused by green claims of companies. These results support the study of Chen and Chang (2013) and Chang and Chen (2014). More specifically, consumer's greenwash perception has a stronger effect on green perceived risk, compared to green confusion. That means consumers are likely to be skeptical, overloaded by information and complicated by evaluation of green applications of companies but their expectation for product and greenness of companies will be more negative and more unambiguous and riskier communication will result due to greenwash perception. Thus, it is importantly revealed from the results that green claims perceived as an untruthful and misleading result in negative outcomes. Strong possibility of reflection of these negative emotions to consumption and purchasing behavior (Pavlou, 2003) makes the results more important for companies. Hence, it is advisable for companies to avoid misleading, exaggerated and unrealistic environmental claims in marketing communication applications.

The result of the current study empirically supports the negative effects of green confusion and green perceived risk on green trust. When consumers feel confusion about the green applications of companies, their perception on the companies' credibility of environmental performance may decrease. This finding of the current study is also similar to Polonsky et al (2010), indicating greenwashing as a barrier to trust building. Consumer perception of company's environmental competence and benevolence, which all are positive emotions and indicate trustfulness, are affected by risk perception. Thus, consumers perceiving risk on green applications of companies will be more likely to search for more but truthful information. So, consumers' uncertainties about companies' green claims should motivate companies for clearer, more specific and applicable environmental messages. Companies can increase trust by focusing on knowledge-based trust about the products and the procedures, especially for gas station companies. As Singh et al. (2011) indicate, the green features of oil products are not naturally occurring and thus it should be physically designed for offering certain attributes. Since companies have to communicate non actual product attributes, they also have to create value and enhance the brand image.

The research model finally confirms that green trust has a statistically significant and positive effect on green brand equity. In this study, green brand equity is evaluated on the customer base. Therefore, it reflects customer based green brand equity. This result indicates that green trust is a way of favorable brand associations. The result is also consistent with the studies of Morgan and Hunt (1991) and Kim et al. (2008). It can be said that building trust towards companies' green applications can be helpful for gas station companies to take advantage of competition, in the context of developing a unique brand. Thus, it is advisable for gas station companies to increase brand value via true environmental claims. In other words, positioning a favorable green brand can be achieved by building trust towards companies' green claims.

Enhancing green trust, eliminating green confusion and green perceived risk can be a way of creating green brand equity. Because organizations are the main reason for environmental problems, they have to address environmental issues. A successful green brand requires a clear understanding of the negative effects of greenwashing.

After testing the research model, a perceived greenwash index was calculated to see the effect of index value on green brand equity and to reveal the direct effect of consumers' greenwash perception on green brand equity. This result is also expected to be helpful for both advertising practitioners and green consumers. Items indicating overall greenwash perception include untruthful, deceptive and misleading green claims in advertisements of gas station companies. Perceived greenwash index measured by these items is found to influence green brand equity negatively. For making comparisons among gas station companies, greenwash indexes and perceived green brand equity values for each gas station are given in the study. According to the results, the company having the highest level perceived greenwash index is found as Total Oil, and Opet has the lowest. More specifically, the gas station companies are ranked in order of highness level of perceived greenwash index, as Total Oil, BP, Shell, PO, and Opet. Conversely, gas station companies ranging from high to low perceived green brand equity are indicated as Opet, PO, Shell, Total Oil and BP. That is, as consumers' greenwash perception on a certain gas station brand increases, their perception of green brand equity on this brand decreases. The more perception of greenwashing indicates the less perception on green brand equity. This is one of the most important findings of this study. Perception of greenwash index can lead to less level of green brand equity in the context of gas stations' green advertising claims. Misleading green product advertising claims with words, visuals, and graphics causes negative perception on green brand equity. Thus, gas station companies should increase green brand

equity by avoiding consumers' doubtfulness, hesitation and by convincing them of their environmentally friendly products. As a result, consumers' perception on companies' declaring true environmental claims can allow companies to compete with rivals.

The result of the study reveals that greenwash perception has a considerable effect on green brand equity of gas station companies. Therefore, there is no need for companies to take risky accusations of greenwashing. It is advisable for companies to integrate environmental issues into their marketing strategies. Their environmental performance necessarily should reflect their commitments. They should declare certain and accessible claims and promises on their environmental performance.

The main limitation of this study is using non probability sampling. Thus, the results cannot be generalized to all population. Besides, the last outcome of the study is limited with green brand equity. However, greenwashing consequences are not limited with that. It may have effects on the other dimensions (e.g. intention, behavior). As Hemantkumar and Priya (2014) indicate, companies can get benefit from green brand equity to generate purchase intention, a price premium and so on. Thus, the model of green brand equity can be extended into other possible outcomes, such as brand attitude and purchase behavior. Since consumers' perception of greenwash can change in different industries, the research model can also be applicable for brands of goods and services in different industries. Thus, future researchers can make comparisons among different sectors and their perceived environmental applications.

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