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# GREEN PRODUCT PRICING AND MALAYSIAN CONSUMERS' WILLINGNESS TO PAY

**Jeen Wei Ong[1*], Gerald Guan Gan Goh[2], Choon Yih Goh[3], Marianne Shing Mei Too[4] and Lee Pheng Goh[5]**

[1,2,3,4,5]Faculty of Business, Multimedia University, MALAYSIA
[*]Corresponding author: jwong@mmu.edu.my

*This study aims to examine the price that consumers are willing to pay for green products relative to their non-green substitute and the actual price of the products in the market. While the price factor of green products has been investigated in previous studies, the focus has not been on the price that consumers are willing to pay for green products in comparison to non-green substitutes and actual price of the products in the market. In addition, the effects of demographic factors on the price that consumers are willing to pay for green products are also examined here. The study examined three categories of green products i.e. shampoo, light bulb and air-conditioners. The price that the respondents are willing to pay is obtained through a questionnaire. The results show that respondents are willing to pay significantly higher prices for green products relative to the non-green substitutes but the prices are significantly lower than the actual prices in the market across all the three categories of products. Furthermore, only ethnicity and income are found to influence the price consumers are willing to pay for green shampoo. The findings suggest that respondents are willing to pay premium prices for green products but are unlikely to purchase the green products due to the significant difference between the prices they are willing to pay for green products and the actual prices of these products in the market.*

Keywords: green products, demographic factors, green product pricing

## INTRODUCTION

Environmental issues have been a government agenda for more than two decades (International Centre for Genetic Engineering and Biotechnology, 1992) and over the last few years people's awareness on environmental issues has greatly increased globally through initiatives such as the Copenhagen Climate Summit (Shah, 2009). Malaysia has also committed herself to a range of environmental initiatives by investing significant resources to increase environmental awareness among the citizens (Economic Planning Unit, 2010). Notably, the Prime Minister

of Malaysia, Datuk Seri Najib Tun Razak, has made a pledge of a 40% reduction in carbon emissions by 2020 at the Copenhagen Climate Summit in 2009 (Sinnappan, 2010). The implementation of environmental initiatives has always been a challenge to the country in terms of national development and environmental sustainability (Tan and Lau, 2009). As the country is heading to become an industrialised nation (Eltayeb and Zailani, 2009), environmental degradation has occurred and water and air pollution, deforestation, household waste disposal and depletion of non-renewable natural resources becoming issues that ought to be tackled (Tan and Lau, 2009). In Eltayeb and Zailani's view (2009), corporations are the main culprits of these environmental problems. Hence, both the public and private sectors play a very important role in curbing and solving environmental problems. Ramayah, Lee and Osman (2010) state that the recycling rate in Malaysia is only at around 3% to 5% although nearly 30% of the garbage collected nationwide are, in fact, recyclable. This indicates that not only the government and private sectors are to be blamed as consumers also have a pivotal role to play in tackling environmental issues in Malaysia.

Environmental initiatives and policies have been implemented and proposed by the government to solve the concerns mentioned earlier. The Ministry of Energy, Green Technology and Water was a new government ministry established in 2009 to focus on the development of green technology in pursuit of sustainable development in Malaysia (Sinnappan and Azmawani, 2011). Among the key initiatives of the ministry was the formulation of the National Green Technology Policy. This policy focuses on four main segments of the nation from an environmentally sustainable perspective. These four segments include the provision of better quality of life for the Malaysian society, ensuring energy independence and usage efficiency, minimising the negative impacts of technology on the environment and to improve the nation's economy through the use of green technologies (Sinnappan, 2010). The role played by the Ministry of Energy, Green Technology and Water is further supported by the other ministries. For instance, it works closely with the Ministry of Transport and the Ministry of International Trade and Industry to develop hybrid technology vehicles (Jeong, 2010). The Ministry of Education also plays a role by introducing environmental programmes in educational institutions to promote environmental awareness among the younger generations (Tan and Lau, 2009). Such programmes are crucial to create a positive relationship between environmental knowledge and attitude (Bradley, Waliczek and Zajicek, 1999; Tan and Lau, 2009). The government is aware that such information must be made available to the young so that they will become more environment-conscious and sensitive to the well-being of the environment.

The private sector in Malaysia also has a key role to play in supporting the government's initiatives on environmental issues and accordingly, Nabsiah, Rahbar and Tan (2011) assert that corporate organisations must produce

environmentally-friendly products that do not damage the environment. Indeed, many companies have taken the responsibility to play a bigger role in our quest to safeguard our environment. For instance, Panasonic Malaysia introduced the inverter technology in its electronic appliances that consumes lesser energy than its conventional counterpart. This has assisted the nation in promoting green awareness and the use of environmentally friendly solutions in society (Jeong, 2010).

Nevertheless, there is a greater need for manufacturers to adopt more environmental-friendly or green operation approaches to support the government's initiative to reduce carbon emissions. On the whole, it is likely that manufacturers take more environmentally-friendly approaches via the development of new technology that gives them the competitive edge or regard them as part of their corporate social responsibility (CSR) initiative, besides complying with the regulations. Businesses may also use green initiatives and features in their products and services to differentiate themselves from competitors albeit at a higher sales price. In addition, firms that adopt environmentally-friendly approaches can reduce the cost of operating in the long run because going green is the way to reduce wastage by reusing resources (Ganesan, 2010). For example, energy saving bulbs saves up to 75% electricity cost as compared to the conventional incandescent light bulbs (Boyes, 2008). Adopting green approaches in production require investment in various areas such as research and development, new infrastructure and equipment, and operational expenditure in auditing. Hence, production costs will increase which will raise the price structure of these products. Studies have shown that an increasing number of consumers support the use of green products and are, thus, willing to pay a premium price for them (Bang et al., 2000; Laroche, Bergeron and Barbaro-Forleo, 2001; Yuhanis, 2004; Tsen et al., 2006; Hamzaoui-Essoussi and Linton, 2010). With the increasing demand for society and businesses to be responsible in protecting the environment, a direct response on an individuals' intention to purchase green products will expose the threat of socially desirable responses (Grunert and Rohme, 1992). A socially desirable response is a response that is accepted and desired in a community based on its cultural norms and values (Steenkamp, Jong and Baumgartner, 2009).

Existing studies on the marketing of green products focus heavily on the consumers' intention to buy green products (e.g. Minton and Rose, 1997; Kim and Choi, 2005; Gan et al., 2008; Tan and Lau, 2010). Although previous studies (Mandese, 1991; Laroche, Bergeron and Barbaro-Forleo, 2001) have argued that consumers are willing to pay a premium price for green products, the actual price that the consumers are willing to pay remains unknown. In addition, the quantity and frequency of purchase would influence the consumers' sensitivity towards the price of the products (Krishnamurthi and Raj, 1991). Thus, this study examines the price that consumers are willing to pay for green products as an

indication of their willingness to purchase as price is one of the most important components in marketing and consumer purchasing decisions (Lichtenstein, Ridgway and Netemeyer, 1993). This study also compares the price consumers are willing to pay for them in comparison to the actual price of the products in the market. This would hopefully be able to minimise the complications arising from respondents providing socially desirable responses as their willingness to pay price premium for green products are measured indirectly.

## LITERATURE REVIEW

Widespread global environmental degradation has led to public concern over the last two decades (Shukri and Muhamad Lukhman, 2007). Developing countries such as Malaysia face a huge challenge to balance between development and environmental sustainability (Tan and Lau, 2010). The 21st century is touted as the century of the environment which makes it necessary for businesses to keep up with the trend to produce environmentally-friendly products and incorporate better technologies in response to society's needs (Hadyn, 2005). In line with this, the Malaysian government has given full support in protecting the environment by enacting the *Environmental Quality Act 1974* and the establishment of a new Ministry of Energy, Green Technology and Water to cater to the rising need of green technology towards sustainable development in Malaysia (Sinnappan and Azmawani, 2011).

### Green Products and Consumers' Willingness to Pay

Terms such as environmentally friendly products, ecological products and green products, which can be used interchangeably (Tan and Lau, 2010) refer to products that have lesser impact on the environment and/or can be recycled or conserved (Shamdasani, Chon-Lin and Richmond, 1993). Green products also refer to products that use less packaging non-toxic materials to reduce pollution levels (Elkington and Makower, 1988; Wasik, 1996; Tan and Lau, 2010). Fotopoulos and Athanassios (2002) describe environmentally friendly products as products that are related to improvement in health and quality of life. Although the quality attributes of green products are largely unobservable, hence making them credence goods, they are effectively being marketed to address the consumers' concerns on the safety of these products (Loureiro, McCluskey and Mittelhammer, 2002). This enables the needs and wants of the consumers to be satisfied at the same time reducing its impact on the environment (Adcock, 2000). Hence, marketers usually sell such products at a higher price compared to conventional products (Yuhanis, 2004).

Values, beliefs/knowledge, needs and motivations, attitudes and demographics have often driven consumer choices with regard to decisions to purchase environmental friendly products (Bui, 2005). However, there have been very few studies on green-products purchasing behaviour (Tanner and Kast, 2003; Lee, 2008; Cheah, 2009). A few Malaysian researchers have conducted studies that predict one's intention to purchase green products such as Lee (2008), Rashid (2009), Iman Khalid and Yuserrie (2011), Sinnappan and Azmawani (2011) and Ooi, Kwek and Tan (2012). Findings indicate that two factors play a role in influencing purchase intention and purchase decision which are the attitude of others and unexpected situational factors. For example, the consumer may form a purchase intention based on factors such as expected price (Iman Khalid and Yuserrie, 2011). In light of this, to what extent are consumers willing to pay for these environmentally friendly products? The term "willingness to pay" is defined by the Organization for Economic Cooperation and Development (OECD) as "the stated price that an individual would accept to pay for avoiding the loss or the diminution of an environmental service" (Organization for Economic Cooperation and Development [OECD], 2010).

## Green Products Pricing and Consumers' Willingness to Pay for Green Products

In marketing, price is the "sum of all the values that customers give up in order to gain the benefits of having or using a product or service" (Kotler and Armstrong, 2007: 266). Price also refers to the amount of economic outlay that a consumer must sacrifice in order to make a purchase or transaction (Lichtenstein, Ridgway and Netemeyer, 1993). Yet another definition provided by Nagle and Holden (2002) is that price refers to the monetary value which the buyer must give to a seller as a part of a purchase agreement.

The motivating factors such as price, quality and availability (Zeithaml, 1988; Wasik, 1992; Stanton, Etzel, and Walker, 1994) must be satisfied in customers' purchase decision process (Howard and Sheth, 1969; Wasik, 1992). Their purchasing decision will be driven by the availability or quality of the product if the price of the product is not satisfactory enough to lead to a purchase (Nisel, 2001). Hence, it can be safely concluded that price plays an important role in the consumer purchase decision-making process (Smith and Carsky, 1996; Kenesei and Todd, 2003) and acts as the primary purchasing motivator (Holden and Nagle, 1998).

Similarly, D'Souza, Taghian and Lamb (2005) also argue that price, besides quality, is an important determinant in the consumers' product selection process. Since price is the antecedent of green purchases, businesses that are pursuing green products should avoid practising premium pricing strategy (D'Souza, Taghian and Lamb, 2005). According to Holden and Nagle (1998),

price is a weapon for businesses in their competition with each other to gain more sales and a greater market share.

In relation to this, various studies have been conducted to gauge the willingness of consumers to pay for green products. Evidence suggests that consumers are willing to pay a relatively higher price for various green products (Johnston et al., 2001; Roe et al., 2001; Cason and Gangadharan, 2002; Loureiro and Hine, 2002; Loureiro, McCluskey and Mittelhammer, 2002; Moon et al., 2002; Bjørner, Hansen and Russell, 2004; Shen, 2012). However, Nisel (2001) and Hopkins and Roche (2009) found that price is an insignificant determiner in the purchase decision of the consumers.

Another important concept in purchasing decisions is price sensitivity, which can be defined as the "response of an individual to the amount of money asked or paid for a good or service," (Clausen, 2005: 2). Customers normally fall into two categories, the moderate usage customers who are less sensitive to price, and the intensive usage customers who are more sensitive to price (Munnukka, 2005). For price-sensitive consumers, changes in the price will lead to changes in their buying behaviour (Clausen, 2005) and Monroe (1990) claims that consumers with high price-sensitivity are not willing to pay a "price premium" for products and services. Price premium refers to the excess prices over and above the "fair" price, which reflects the "true" value of the product (Rao and Bergen, 1992; Vlosky, Ozanne and Fontenot, 1999). Naturally, most consumers want high quality products at the lowest possible price (Holden and Nagle, 1998) and Mandese (1991) claims that green consumers have high price-sensitivity when they make purchase decisions on environmentally-friendly products.

Nisel (2001) indicates that the main determinant for consumers' purchase decision is low price. While Yuhanis (2004) claims that not many consumers are willing to pay premium price for green products, a significant number of studies have found that the level of willingness to pay more for environmentally-friendly products is generally high, with Kapelianis and Strachan (1996) observing that more than 82% of their research respondents were interested in paying for green goods at a premium. This outcome is echoed by Bhate and Lawler (1997), Ozanne and Smith (1997), Roozen (1997), Chan (1999), Nimon and Beghin (1999), Vlosky, Ozanne and Fontenot (1999), Johnston et al. (2001), Krystallis, Arvanitoyannis and Kapirti (2003), Sanjuan et al. (2003), Donovan (2004), Yuhanis (2004), and Barber, Taylor and Strick (2009) among others.

Other researchers have taken a step further to investigate the amount consumers are willing to pay for green products. Among some of these researchers, Saphores et al. (2007) found an average willingness to pay a premium of 1% for green electronics; Drozdenko, Jensen and Coelho (2011) discovered that their sample of homeowners are willing to pay a 9.5% premium for a green music player; Loureiro, McCluskey and Mittelhammer (2002) state that consumers were willing to pay a 5% premium for eco-certified apples and

Gil, Garcia and Sanchez (2000) found that consumers are willing to pay premiums ranging from 8% to 25% for different types of organic food. Meyers and Gerstman (2007) reported that consumers are willing to pay 5% more for environmentally sound package product. Other researchers that have similar findings are Jensen et al. (2003), Krystallis and Chryssohoidis (2005), Aguilar and Vlosky (2007) and Barber, Taylor and Strick (2009).

Past studies indicate that consumers are generally willing to pay a premium price for green products, but the amount that they are willing to pay will vary according to product category and other factors such as potential savings resulting from the purchase, perceived benefits and perceived functionality of the products (Hopkins and Roche, 2009; Hamzaoui-Essoussi and Linton, 2010; Drozdenko, Jensen and Coelho, 2011). A study by the Boston Consulting Group reviewed that different categories of products command different premiums in the market (Hopkins and Roche, 2009). Jay (1990) concluded that green marketers targeting green consumers must be able to balance between the setting of green products prices with consumers' cost sensitivity and their willingness to pay for environmental safety.

Although price is one of the most important components in the capitalist market system (Lichtenstein, Ridgway and Netemeyer, 1993), but there are very few studies that looks at the level of price that consumers are willing to pay more for the green products especially in Malaysia (Yuhanis, 2004). As such, this study will attempt to narrow this gap and also to obtain the price differences between the prices that consumers are willing to pay with the actual prices of the green products in the market in Malaysia.

## RESEARCH METHODS

This study uses the questionnaire survey method for data collection. The respondents are required to indicate the prices they are willing to pay for the green products as shown in the questionnaire. The products are shampoo, light bulb and air-conditioner. The products were selected based on a preliminary study of 30 respondents on their most familiar consumable products, low-price non-consumable product and high price non-consumable product. The most mentioned product from each category was then selected. For each category, a non-green product with its features and description, and quoted price will be used as a point of reference for the respondents to make their decision. Then, the products with green features are shown in the questionnaire. The respondents are required to provide the prices they are willing to pay for the green products in all the three categories. Apart from the additional green features in the green products, the features of the green and non-green products that are provided to the respondents are identical.

The additional green features for green shampoo include the use of biodegradable materials for packaging and absence of harmful chemicals. For the light bulb, the life span, electricity consumption, carbon dioxide and heat emission of both incandescent light bulb (non-green) and compact fluorescent lamp (CFL) (green) are shown while the additional green feature in the air-conditioner is the use of environmentally friendly material in its design.

The respondents of the study were identified using non-probability sampling. The respondents were approached on a face-to-face basis in some public areas such as wet markets, government offices and temples and through personal contacts in the state of Melaka, Malaysia. There were 304 sets of usable questionnaires were successfully collected. The results of the analysis are presented in next section.

## FINDINGS

The results of the statistical analysis of the data are displayed in Tables 1, 2 and 3. Table 1 shows the demographic information of the respondents who participated in this study. Based on the frequency analysis, it can be seen that 58.1% of the respondents are females. The ethnic composition indicates that Malay and Chinese respondents make up 40.8% and 35.5% respectively. In terms of age group distribution, 32.9% are between 31 and 40 years, 29.9% below 30 years, 21.4% between 41 and 50 years while another 15.8% are more than 50. In term of the respondents' educational level, 65.3% of the respondents have attended tertiary level of education. The information on monthly income shows that 46% have a monthly income of between RM1,001 and RM3000, 35.5% have a monthly income that is higher than RM3,001 while the remaining 18.5% earn RM1,000 and below per month.

The results in Table 2 show the sources of information where the respondents learn about green products. Most of the respondents obtain such information from the mass media (61.2%), followed by advertisements (54.6%). Only 16.8% of the respondents claim that they heard about green products information from their family members.

The results in Table 3 show the mean and standard deviation of the prices that the respondents are willing to pay for each category of green products and the significant difference of the prices they are willing to pay for them relative to the non-green substitutes and the actual price of the green products in the market.

For shampoo, the price for the non-green reference given in the questionnaire is RM19.80. The mean for the price that the respondents are willing to pay for the green shampoo with identical features apart from the pro-environmental ingredients is RM20.38 with a standard deviation of 4.23. The

one-sample t-test shows that the respondents are willing to pay significantly higher price for the green shampoo relative to the conventional shampoo ($t = 2.421$; $p < 0.05$). Nonetheless, the price that the respondents are willing to pay for green shampoo is lower than the market price of the green shampoo of RM25.90 with t-value of –22.725 ($p < 0.05$). This concludes that the respondents are willing to pay a higher price for the green shampoo but the price they are willing to pay is still below the market selling price of the product.

A similar kind of results can be observed for the air-conditioner and light bulb. The mean of the price that the consumers are willing to pay for the air-conditioner with additional green features is RM811.91 (standard deviation = 294.13), relative to RM698.00 for the non-green substitute and RM989.00 for the actual price of the green air-conditioners in the market. The results of one-sample t-test show that the price that the respondents are willing to pay for the green air-conditioner is significantly higher than the non-green reference given in the questionnaire ($t = 6.753$; $p < 0.05$) and the actual price of the green air-conditioner in the market ($t = –10.498$; $p < 0.05$).

Table 1: Demographic profile of the respondents

| | Variable | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 127 | 41.8 |
| | Female | 177 | 58.2 |
| Ethnicity | Malay | 124 | 40.8 |
| | Chinese | 108 | 35.5 |
| | Indian | 69 | 22.7 |
| | Others | 3 | 1.0 |
| Age group | 30 and below | 91 | 29.9 |
| | 31–40 | 100 | 32.9 |
| | 41–50 | 65 | 21.4 |
| | 51 and above | 48 | 15.8 |
| Education level | None, primary and secondary | 105 | 34.7 |
| | Tertiary | 198 | 65.3 |
| Monthly income | RM1,000 and below | 56 | 18.5 |
| | RM1,001–RM3,000 | 139 | 46.0 |
| | RM3,001 and above | 107 | 35.5 |

Table 2: Sources of green products information

| Sources | Frequency | Percentage |
|---|---|---|
| Mass media | 186 | 61.2 |
| Friends | 118 | 38.8 |
| Family | 51 | 16.8 |
| Advertisements | 166 | 54.6 |

Table 3: One-sample t-test for the prices that the respondents are willing to pay for green products compared to the non-green substitutes and market prices

| Variables | Min. | Max. | Mean | Std. Dev. | t | Sig. |
|---|---|---|---|---|---|---|
| Green Shampoo | 8.00 | 39.90 | 20.38 | 4.23 | | |
| vs. Non-green shampoo (RM19.80) | | | | | 2.421 | 0.016 |
| vs. Market price (RM25.90) | | | | | –22.725 | 0.000 |
| Green Air-conditioner | 250.00 | 5000.00 | 811.91 | 294.13 | | |
| vs. Non-green air-conditioner (RM698.00) | | | | | 6.753 | 0.000 |
| vs. Market price (RM989.00) | | | | | –10.498 | 0.000 |
| Compact fluorescent lamp (CFL) | 1.00 | 20.00 | 5.67 | 3.55 | | |
| vs. Incandescent light bulb (RM2.50) | | | | | 15.440 | 0.000 |
| vs. Market price (RM23.90) | | | | | –88.667 | 0.000 |

The price of the incandescent light bulb given in the questionnaire is RM2.50. The mean of the price that the respondents are willing to pay for the compact fluorescent lamp (CFL) is RM5.67 (standard deviation of 3.55). The actual price for CFL in the market is RM23.90. The results of one-sample t-test show that mean of the price that the respondents are willing to pay for CFL is significant higher than the price of the Incandescent light bulb given in the questionnaire ($t = 15.440$; $p < 0.05$). Nonetheless, similar to the shampoo and air-conditioner, the price the respondents are willing to pay for CFL is significant lower than its market price ($t = –88.667$; $p < 0.05$).

In addition to testing the price that the respondents are willing to pay for the green products relative to the non-green substitutes and their actual price, this study examined the impact of demographic factors (gender, ethnicity, age, educational level and income) on the price that the respondents are willing to pay. The age group of the respondents are recoded into three groups, namely 30 years old and below, 31 to 40 years old and 41 years old and above while the monthly income is recoded into two groups –RM3,000 and below, and above RM3,000. The results of independent sample t-test (for gender, educational level and income) and one-way ANOVA (for ethnicity and age) are presented in Table 4 (shampoo), Table 5 (CFL) and Table 6 (air-conditioner).

Table 4 presents the results of the effect of demographic factors on price that the respondents are willing to pay for green shampoo. The results indicate that only ethnicity ($F = 6.854$; $p < 0.05$) and income ($t = –2.225$; $p < 0.05$) have a significant impact on the price that the respondents are willing to pay for green shampoo. The Malay respondents are found to be willing to pay a significantly lower price for green shampoo (mean = 19.32; standard deviation = 4.28) relative to Chinese (mean = 21.02; standard deviation = 3.93) and Indian respondents (mean = 21.26; standard deviation = 4.29). No significant difference can be seen between Chinese and Indian respondents in the price they are willing to pay for green shampoo. On the other hand, the result of independent sample t-test reveals a significant different between respondents with income RM3,000 and below and above RM3,000 in the price they are willing to pay for green shampoo ($t = –2.225$; $p < 0.05$). Respondents with a monthly income of RM3,000 and below are willing to pay RM19.99 on average (standard deviation = 4.39) for green shampoo compared to RM21.10 (standard deviation = 3.85) by the respondents with a monthly income of above RM3,000. Thus, the higher income group is willing to pay significant higher price for green shampoo. Based on the analyses, it can be concluded that gender, age and educational levels have no effect on the price that the respondents are willing to pay for green shampoo.

The results of the impact of demographic factors on the price that respondents are willing to pay for CFL are shown in Table 5. The results show that gender, ethnicity, age, educational level and income have no significant effect on the price that the respondents are willing to pay for CFL.

Similar to the results of the effect of demographic factors on the price the respondents are willing to pay for CFL, demographic factors of the respondents are not found to have any significant impact on the price respondents are willing to pay for air-conditioners with green features. The results of the independent samples t-test and one-way ANOVA are presented in Table 6.

Table 4: The effect of demographic factors on the price respondents are willing to pay for green shampoo

| Variable | N | Mean | Std. Dev. | t-/F-value | Sig. |
|---|---|---|---|---|---|
| Gender | | | | 1.019 | 0.309 |
| Male | 127 | 20.68 | 3.72 | | |
| Female | 177 | 20.18 | 4.56 | | |
| Ethnicity | | | | 6.854 | 0.001 |
| Malay | 124 | 19.32 | 4.28 | | |
| Chinese | 108 | 21.02 | 3.93 | | |
| Indian | 69 | 21.26 | 4.29 | | |
| Age | | | | 0.356 | 0.701 |
| 30 and below | 91 | 20.66 | 4.48 | | |
| 31 to 40 | 100 | 20.40 | 3.79 | | |
| 41 and above | 113 | 4.41 | 0.41 | | |
| Educational level | | | | –1.779 | 0.076 |
| None, primary and secondary | 105 | 19.80 | 4.43 | | |
| Tertiary | 199 | 20.70 | 4.10 | | |
| Income | | | | –2.225 | 0.027 |
| Below RM3,000 | 195 | 19.99 | 4.39 | | |
| RM3,000 and above | 109 | 21.10 | 3.85 | | |

Table 5: The effect of demographic factors on the price the respondents are willing to pay for compact fluorescent lamp (CFL)

| Variable | N | Mean | Std. Dev. | t- / F-value | Sig. |
|---|---|---|---|---|---|
| Gender | | | | 0.986 | 0.325 |
| Male | 127 | 5.91 | 3.93 | | |
| Female | 177 | 5.50 | 3.25 | | |
| Ethnicity | | | | 0.555 | 0.575 |
| Malay | 122 | 5.45 | 3.46 | | |
| Chinese | 108 | 5.94 | 3.34 | | |
| Indian | 66 | 5.48 | 3.56 | | |
| Age | | | | 1.382 | 0.250 |
| 30 and below | 91 | 5.47 | 3.33 | | |

*(continued on next page)*

Table 5: (*continued*)

| Variable | N | Mean | Std. Dev. | t- / F-value | Sig. |
|---|---|---|---|---|---|
| 31 to 40 | 98 | 6.16 | 4.34 | | |
| 41 and above | 110 | 5.41 | 2.88 | | |
| Education level | | | | –0.829 | 0.408 |
| None, primary and secondary | 102 | 5.45 | 3.04 | | |
| Tertiary | 197 | 5.79 | 3.80 | | |
| Income | | | | –1.403 | 0.143 |
| Below RM3,000 | 191 | 5.45 | 3.32 | | |
| RM3,001 and above | 109 | 6.07 | 3.92 | | |

Table 6: The effect of demographic factors on the price the respondents are willing to pay for green air-conditioner

| Variable | N | Mean | Std. Dev. | t-/F-value | Sig. |
|---|---|---|---|---|---|
| Gender | | | | –0.658 | 0.511 |
| Male | 127 | 798.80 | 156.37 | | |
| Female | 177 | 821.32 | 362.24 | | |
| Ethnicity | | | | 0.831 | 0.437 |
| Malay | 124 | 790.05 | 141.91 | | |
| Chinese | 108 | 812.94 | 214.54 | | |
| Indian | 69 | 847.20 | 523.42 | | |
| Age | | | | 2.060 | 0.129 |
| 30 and below | 91 | 863.14 | 495.63 | | |
| 31 to 40 | 100 | 798.35 | 117.19 | | |
| 41 and above | 113 | 782.66 | 146.11 | | |
| Education level | | | | –0.988 | 0.324 |
| None, primary and secondary | 105 | 788.96 | 116.24 | | |
| Tertiary | 199 | 824.02 | 342.71 | | |
| Income | | | | –0.794 | 0.428 |
| Below RM3,000 | 195 | 801.89 | 193.05 | | |
| RM3,001 and above | 109 | 829.83 | 418.64 | | |

## DISCUSSION

The statistical findings indicate that respondents are willing to pay a higher price for green products in comparison to non-green substitutes. The findings reinforce the findings of the studies conducted by Roozen (1997), Chan (1999), Nimon and Beghin (1999), Vlosky, Ozanne and Fontenot (1999), Johnston et al. (2001), Krystallis, Arvanitoyannis and Kapirti (2003), Sanjuan et al. (2003), Donovan (2004), Yuhanis (2004) and Barber, Taylor and Strick (2009). However, the findings also suggest that the price that the respondents are willing to pay for green products is much lower relative to the actual price of the products in the market. The findings imply that the respondents might claim that they are willing to pay higher prices to buy green products but the actual purchasing behaviour is unlikely as the price that they are willing to pay for the items is much lower compared to their actual price in the market.

The findings could be the genesis of further problems in research that looks solely at the consumers' intention to purchase green products and whether they are willing to pay premium price for them. Both the intention to purchase and willingness to pay could have been overstated unless the actual price that the respondents are willing to pay is taken into consideration.

On the other hand, the findings reveal that demographic factors have minimal impact on the price that the respondents are willing to pay for the products. Only ethnicity and income are found to affect the price that the respondents are willing to pay for green shampoo; with the Chinese and Indian respondents willing to pay more than the Malay respondents and the respondents with higher income are willing to pay more than those with lower income. Cultural and religious concerns of the Malays may play a role in their willingness to pay more for the shampoo. In addition, many may prefer to buy shampoos that are certified as *halal*. Income on the other hand would play a role as those from the higher income bracket would have more disposable income that would in turn allow them to spend more on these green products.

## MANAGERIAL IMPLICATIONS

Based on the findings of this study, the producers of green products are advised to reconsider the price they set for their products. The findings indicate that consumers are willing to pay higher prices for green products but the price that they are willing to pay is much lower compared to the market prices. Hence, price adjustments could lead to a significant boost in the sales of these items. Bigger sales is expected to lower production costs based on the effect of economic of scale as the market demand would be much higher, and there will be more production leading to lower production costs.

Besides, policy makers can also assist the green products segment in terms of costing. The government's move to provide rebates to consumers who purchase green electrical products in Malaysia (Ministry of Energy, Green Technology and Water, 2011) encourages Malaysians to adopt green products. Nonetheless, in the long run, policy makers should focus on assisting the green product producers to adopt technologies and best practices for greater efficiency that will lower the production cost. This will enable the green products to be sold at lower prices in the market.

## CONCLUSIONS

The findings suggest that Malaysians are willing to pay higher prices for green products but the price they are willing to pay is relatively lower to the market prices. Similar findings are observed across the three different categories of products in the study, namely shampoo, light bulb and air-conditioner. Hence, this casts doubts on the actual purchasing behaviour of consumers on green products. In addition, the study reveals that demographic factors have a minimal impact on the price that consumers are willing to pay for green products. This also puts a doubt on the market segmentation strategy that is based on the demographic factors of the consumers.

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