

Purchase Intention of Consumers for an Automobile in the United States: A Hierarchical Regression Model

Hao Fan Mo
Jinwen University of Science and Technology

Wong Ming Wong
Shantou University

The purpose of this study is to examine the purchase intention of consumers who may be interested in purchasing an automobile in the United States. The study adopted the Theory of Reasoned Action model that explores the gender, age, and race of consumers and relates it to their purchase intention of consumers for automobiles, moderated by income. The research sample consisted of 562 respondents and was collected from Los Angeles County in the United States. The results of the study indicated that the purchase intention of consumers is affected by their age and race.

The objective of this study is to explore the purchase intention of consumers for an automobile in a multiracial society, after moderating for income, as it relates to the gender, age, race of consumers by utilizing the Theory of Reasoned Action model. Furthermore, the study emphasized the correlation between race of consumers and their purchase intention in a multiracial and multicultural society. Researchers and marketers utilize demographics from the view of the microenvironment because “people make market up” (Kotler & Keller, 2006). The size of the population, age, race, city size, religious background, educational level, income, and household size all influence the consumers’ attitudes, beliefs, and values, which in turn affect the purchase intention and behavior of consumers (Kotler & Keller, 2006). Peter and Olson (2008, p. 5) state that “consumer behavior involves the thoughts and feelings people experience and the actions they perform in consumption processes.” Furthermore, demographic factors of consumers can be easily measured and the data is accessible for market segmentation (Kotler & Keller, 2006; Wang, Chan, & Chen, 2001).

Additionally, in order to understand consumers who want to purchase an automobile, their purchase intention “is the single best predictor of actual behavior” (Peter and Olson, 2008, p. 147). The term intention is a plan to purchase something in the near future (Peter & Olson, 2008). Behavior is an action for some target object at a particular time (Peter & Olson, 2008). There is a time frame between the intention a consumer may have and the actual behavior of the consumer when they act on the intention (Peter & Olson, 2008). Therefore, the study explores the correlation between demographic factors of consumers and their intention to purchase an automobile in Los Angeles County, California, the United States.

BACKGROUND

The research problem is how to identify consumers who have a high intention to purchase an automobile during an economic recession in a multiracial society such as the United States. Nowadays, there are two phenomena of the study background that is related to the sales of automobiles in the United States market. First, during a recession the number of automobiles sold is lower, however, there are still consumers who purchase an automobile. Comparing 2007 with 2008, the number of automobiles sold in the United States dropped 18% from 16.1 million to 13.2 million automobiles (Krebs & Visnic, 2009). In 2009, the number of automobiles sold dropped another 21% from 13.2 million cars to only 10.4 million (Krebs, 2010). However, in 2010 automobile sales recovered about 11% from 10.4 million to 11.5 million (Visnic, 2011). In short, the number of automobiles sold between 2007 and 2010 show that during an economic recession consumers reduced their automobile purchasing. Nevertheless, more than 10 million automobiles were sold during this recessionary period. In other words, the macroeconomic influence factors affect consumers' behavior. It is in the marketers and manufacturers interest to understand how to identify who will be consumers and who will have a high intention to purchase an automobile.

Second, the market share of automobile companies who do business in the United States has changed due to globalization. In 2006, the market share of automobile in the United States has been divided into: (a) 23.1% of GM, (b) 15.1% of Ford, (c) 16% of Toyota, (d) 13.3% of Chrysler, (e) 9.2% of Honda, (f) 6.4% of Nissan, (g) 2.6% of Hyundai, and (h) 2.1% of Kia (Detroit, 2007). In summary, the top three Japanese automobile manufacturers held a 31.6% share of the automobile market while the Korean automobile manufacturers held a 4.7% market share in the United States, with a combined 36.3% share of the market.

In May 2008, the automobile market in the United States was divided into the following: (a) 19.3% of GM, (b) 18.5% of Toyota, (c) 14.7 % of Ford, (d) 10.7% of Chrysler, (e) 12.1% of Honda, (f) 7.2% of Nissan, (g) 3.3% of Hyundai, and 2.2% of Kia (The Auto Channel, 2008, June 3). The top three Japanese automobile manufacturers had a market share of 37.8% and Korean automobile manufacturers had 5.5%, totaling 43.3% share of the market in the United States.

In 2010, the automobile market share in the United States changed due to market forces as follows: (a) 19.1% of GM, (b) 16.7% Ford, (c) 15.2% of Toyota, (d) 10.6% Honda, (e) 9.4% of Chrysler group, (f) 7.8% of Nissan, and (g) 7.7 % of Hyundai and Kia (The Good Car Guy, 2011). Japanese and Korean automobile manufacturers held a 41.3% market share. In contrast, the Big Three American automobile manufacturers had a market share of 45.2%. At the end of 2011, the market share of automobile manufacturers in the United States has been divided into (a) 19.6% of GM, (b) 16.8% of Ford, (c) 10.7% of Chrysler group, (d) 12.9% of Toyota, (e) 9% of Honda, (f) 8.2% of Nissan, and (g) 8.9% of Hyundai and Kia (The Good Car Guy, 2012). The top three Japanese automobiles manufacturers had a market share of 30.1%. Furthermore, the Korean automobile companies increased their market share from 7.7% to 8.9%. Since the American automobile manufacturers are losing market share, it would be in their self-interest to be able to have the capability to identify who will be a consumers or potential consumers in the near future.

LITERATURE REVIEW

Academic researchers and marketers utilize consumer demographics to identify consumers' characteristics that will help them segment the consumer market for automobiles. Furthermore, demographic factors of consumers are "the most readily available and easy to measure on individual consumers" (Wang, Chan, and Chen, 2001, p. 320). More important is that demographic factors of consumers may provide information that will help them predict consumer behavior in terms of consumers' segmentation with psychographic variables (Wang, Chan, & Chen, 2001). Therefore, the study utilized demographic factors of consumers to explore the correlation of their intention to purchase a new automobile, because demographic factors can describe in more detail what individual consumers

need and want. The market environmental factors such as advertising, distribution channel, selling price, and brand also affect a consumer's intention for purchasing an automobile.

Demographic factors of consumers can be separated into (a) gender, (b) age, (c) income, (d) educational background, (e) race, and (f) marital states (Kotler & Keller, 2006). The study only utilized four demographic factors to explore the relationship with their purchase intention and they are: (a) gender, (b) age, (c) income, and (d) race. Furthermore, income is the moderating variable for the study because income can measure the purchasing ability of consumers. In other words, income can be an index to forecast the purchasing behavior of consumers (Hawkins, Mothersbaugh, & Best, 2007; Kerin, Berkowitz, Hartley, & Rudelius, 2003; Peter & Olson, 2008; Schiffman & Kanuk, 2007). Wang, Chan, and Chen (2001, p. 320) described, "Income is a key factor that determines consumer ability to buy." For purchasing durable products such as housing and automobiles, household income is typically utilized in the research of consumer behavior. In the research of Wang et al., they concluded that the intention of consumers to purchase a house is influenced by their household income, attitude toward debt, and their optimistic/pessimistic view of economic conditions.

Similar research was done by Portolese Dias (2004) and he examined the consumer purchasing behavior for automobile, electronics, clothing, and household goods in terms of the age of consumers. The research sample consisted of 561 respondents by online survey and adopted the snowball sampling method to collect data. The result of Portolese Dias indicated that the income of consumers affected their automobile and clothing purchasing. However, the income of consumers did not affect their purchase of household goods and electronics. Furthermore, regarding the purchase intention of consumers for purchasing clothing, jewelry, or accessories via online, gender and income influenced their purchase (Kim & Kim, 2004). Kim and Kim (200) conducted their research in the United States with a research sample of 3,000 adults who completed the survey at home via online. The e-mail address list was provided by a nationwide database in the United States. The result of this research found that the income of a consumer can be a predictor of their purchase intention in terms of product categories (Portolese Dias, 2004; Kim & Kim, 2004).

Another demographic factor that has been researched to explore its influence on the purchase intention of consumers as it pertains to product categories is gender. For example, research by Ahmad and Juhdi (2010) on the purchase of organic foods and gender found that women were likely to pay more than men if the organic foods were not too expensive and more available in Malaysia. The research also explained that "the intention to purchase organic products were heavily influenced by the perception on organic product worth of purchase and the belief on the safety and health aspect of the product" (Ahmad & Juhdi, 2010, p. 105). Ritter (2004) conducted research on healthcare purchases by senior citizen healthcare consumers in the United States and he found that gender, income, marital status, ethnicity, and education of consumers did not significantly influence senior citizens' healthcare coverage purchase decisions. Ang, Lin, Cheng, and Tambyah (2001) researched the motivation of consumers to purchase counterfeits or pirated goods in Singapore and they found that gender and income of consumers influenced their attitude towards predicting the purchase intention of consumers. Specifically, male and lower income consumers have a high intention to purchase pirated goods such as music CDs.

Age is another frequently used segmentation variable (Hawkins, Mothersbaugh, & Best, 2007; Kerin, Berkowitz, Hartley, & Rudelius, 2003; Kotler & Keller, 2006; Peter & Olson, 2008). Age is constantly utilized with other demographic factors such as gender, income, and race when conducting research on consumer behavior (Ang, Cheng, Lim, & Tambyach, 2001; Kim & Kim, 2004; Portolese Dias, 2004). In addition, age has a strong correlation with the income of consumers (Kotler & Keller, 2006). For example, older consumers have a higher income than younger consumers. Kurtz and Boone (2006) describe that age is a determining factor when it comes to purchasing an automobile and which model to choose. Since this study is concerned with purchasing an automobile, then the age of consumers will be utilized as one of the variables to explore the purchase intention of an automobile consumer.

Mafe and Blas (2008) found that the age of a consumer had an impact on the purchasing behavior of consumers who were shopping for televisions in the country of Spain. The result showed that age was more significant than the impact of gender, education, and income. Furthermore, the age of consumers

had a correlation to how loyal they were to a particular brand. The research of Patterson (2007) also concluded that the age and the occupation of consumers had a strong correlation with brand loyalty to a service industry. The result indicated that older consumers who were over the age of 34 had a higher level of brand loyalty than younger consumers who were between the ages of 18 to 34 in Australia. .

The other demographic variable utilized in this study is race. For the population sample in the United States race has been separated into (a) Asian, (b) Black, (c) Hispanics/Latinos, (d) White, (e) Others. In order to utilize the research time and cost in a prudent manner, the study selected a research population sample from Los Angeles County, California. U.S Census Bureau (2012) reported that the population of Los Angeles County in 2010 was divided into the following races: (a) 13.7% Asian, (b) 8.7% Black, (c) 47.7% Hispanic or Latino origin, (d) 27.8% White persons not of Hispanic or Latino origin.

Race can be defined as a group of people who have a common national, communication, or cultural origin within the larger society (Arnould, Price, and Zinkhan, 2005). Furthermore, race can become an influential factor in segmenting the target market in a strategic marketing plan (Arnould et al., 2005). Kotler and Keller (2006) also indicate that race as well as culture can provide an essential determinant to describe a person's purchasing behavior. In other words, race helps describe a group of consumers who share same value, beliefs, and customs (Schiffman & Kanuk, 2007). For example, Propser (2004) found that Hispanic consumers consult with other people an average of 4.2 times before purchasing an automobile, which is more three times than the national average in the United States. Furthermore, Hispanic consumers place an emphasis on the features of value, price, style, and safety of an automobile.

Another similar research conducted by Berkowitz, Bao, and Allaway (2005) investigated the correlation between the race of consumers and their purchasing behavior as it pertains to product types, brand preference, and store loyalty in the United States. The research sample was divided into two groups: Hispanic consumers and non-Hispanic consumers. The research concluded that neither the Hispanic nor the non-Hispanic consumers showed a significant difference with regard to store loyalty and brand preference. In regards to the product types, they defined utilitarian goods as products purchased for their usefulness such as a book bag while other products were purchased for providing pleasure as hedonistic goods such as cologne. The result of the research indicated that ethnicity was a significant correlation with product types. Therefore, the research concluded that Hispanic consumers and non-Hispanic consumers were different "in terms of store brand purchase mainly in the utilitarian product category, but not in the hedonistic product category" (Berkowitz et al., 2005, p. 19).

In the area of automobile purchasing research, Prasitphol (2002) and Serhateri (2002) have conducted researched on automobile purchasing in different countries. Portolese Dias (2004) also researched consumer purchasing behavior of automobile purchases in terms of cohort groups consumers. The result of Portolese Dias indicated that income is an influential factor that affects the consumers' purchase behavior in the United States.

The research of Prasitphol explored those demographic factors (age, gender, income, occupation, and education) of consumers in Japan, Thailand, and the United States. The result of Prasitphol's research indicated different demographic factors affected consumers in terms of their culture. Culture consists of unique idiosyncrasies that influence the attitudes and beliefs of consumers, which in turn affects the consumers' purchase intention and purchase behavior. As a result, gender was one of influence factors affected the intention of consumers to purchase an automobile in these three countries. Income only affected the intention of consumers to purchase an automobile in Thailand.

RESEARCH QUESTIONS AND HYPOTHESES

As mentioned previously, this study adopted the Theory of Reasoned Action model (Fishbein & Ajzen, 1975) to explore the correlation between demographic factors of consumers and their intention to purchase an automobile in Los Angeles County, the United States. The research questions and hypotheses are listed in the following paragraphs.

Does the demographics (gender, age, and race) of consumers influence their intention to purchase an automobile, after moderating by their income in Los Angeles County?

H₁: Income of consumers does influence their purchase intention.

H₂: Gender of consumers does influence their purchase intention after moderating by their income.

H₃: Age of consumers does influence their purchase intention after moderating by their income.

H₄: Race of consumers does influence their purchase intention after moderating by their income.

METHODS

The study utilized an online survey to collect data by the snowball sampling method. The research sample of the study was collected from working adults, who were 21 years old and above and either living or working in Los Angeles County. Participants were asked to respond to the questionnaire on the website of SurveyMonkey. The benefits of snowball sampling consist of a short research time period and lower cost. In addition, the modern technology of online research provides the capability to confirm that respondents were actually contacted, thus provide a higher level of confidence in the data collected. The email list of 14,000 email addresses in Los Angeles County, California was provided by Bulk Email Software Superstore.

The questionnaire design consists of two parts: (a) demographic factors of consumers; and (b) purchase intention of consumers. The questionnaire requested information on gender, age, race, and income of consumers. Race was divided into (a) Asian, (b) Black, (c) White, (d) Hispanic/Latino, and (e) other. The time of purchase intention was measured by: (a) within 3 months, (b) 4 to 6 months, (c) 7 to 9 months, (d) 10 to 12 months, (e) 13 to 18 months, (f) 19 to 24 months and (g) more than 2 years. The income range has been divided into nine groups: (a) below US\$2,000, (b) US\$2,000 to US\$3,900, (c) US\$4,000 to US\$5,999, (d) US\$6,000 to US\$7,900, (e) US\$8,000 to US\$9,999, (f) US\$10,000 to US\$11,900, (g) US\$12,000 to US\$13,999, (h) US\$14,000 to US\$15,900, and (i) US\$16,000 and over.

According to the research design, the study adopted the hierarchical regression analysis to test hypothesis one to four. Hierarchical regression analysis model is one of multiple regression analysis models and consists of (a) independent variable(s), (b) moderating variable, and (c) dependent variable. The added variable has a moderating effect on the relationship between independent variable(s) and dependent variable (Hair, Black, Babin, Anderson, & Tatham, 2006; Mertler & Vannatta, 2005). Therefore, Hair et al. (2006, p. 201) Hair et al. describes that the moderating variable will moderate “the form of relationship between another independent variable and the dependent variable.”

RESULTS

The number of respondents of this study was 562 and consisted of 42.5% of male and 57.5% of female from Los Angeles County, the United States. The top four age range groups were (a) 46 years to 50 years, 18.3%; (b) 41 years to 45 years, 16%; (c) 36 years to 40 years, 11.7%; and, (d) 31 years to 35 years, 11%. The top three household income range groups are: (a) income range from US\$4,000 to US\$5,999 per month, 30.1%; (b) income range from US\$2,000 to US\$3,999 per month, 23.1%; and (c) income range from US\$6,000 to US\$7,999 per month, 15.8%. The race of the respondents consisted of 18.5% Asian; 9.8% Black; 28.3% White; 40.4% Hispanic; and 3% other.

As it is observed, Table 1 shows the correlation between age and income of consumers. When consumers are older, they have more high income. In contrast with older consumers, younger consumers have less income.

TABLE 1
CORRELATION COEFFICIENTS OF AGE AND INCOME OF RESPONDENTS
IN LOS ANGELES COUNTY

		Age	Income
Age	Pearson Correlation	1	0.323**
Income	Pearson Correlation	0.323**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 shows the value of R^2 increased from 0.001 to 0.061. The 6.1% of the variations of purchase intention are explained by age and race as shown in Table 3. In other words, the dependent variable of purchase intention of consumers in Los Angeles County on age and race can be expressed by the following regression model.

$$\text{Purchase intention} = 3.104 - 0.106 \times \text{age} + 1.274 \times \text{black} + \varepsilon$$

The above model indicates the average purchase intention of blacks exceeded the purchase intention of other races. Thus, if one wants to rank the purchase intention by race: first were Black consumers; second were Hispanic consumers; third were the other race category of consumers; fourth were White consumers; and fifth were Asian consumers.

Regarding the income of consumers, Table 3 illustrates that Model 1 shows the income of consumers did not influence the purchase intention of consumers in Los Angeles County. The second model adopted income as a moderating variable, which shows that income did not influence the consumers purchase intention. In other words, in Los Angeles County the income of consumers did not influence their intention to purchase an automobile.

TABLE 2
R SQUARED OF THE REGRESSION MODEL USED TO TEST HYPOTHESES
ONE THROUGH FOUR

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.027	0.001	-0.001	1.854	0.001	0.400	1	560	0.528
2	0.248	0.061	0.050	1.807	0.061	5.979	6	554	0.000

a. Predictors: (Constant), Income

b. Predictors: (Constant), Income, Gender, Other , Black, Asian, Age, Hispanic

TABLE 3
SIGNIFICANCE LEVEL OF THE COEFFICIENTS OF THE REGRESSION MODEL USED TO TEST HYPOTHESES ONE THROUGH FOUR

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.017	0.165		18.333	0.000		
	Income	-0.025	0.039	-0.027	-0.632	0.528	1.000	1.000
2	(Constant)	3.104	0.358		8.676	0.000		
	Income	0.017	0.042	0.018	0.408	0.683	0.843	1.187
	Gender	0.074	0.156	0.020	0.470	0.638	0.971	1.030
	Age	-0.106	0.036	-0.130	-2.926	0.004	0.863	1.159
	Asian	-0.144	0.235	-0.030	-0.611	0.541	0.696	1.437
	Black	1.274	0.287	0.204	4.447	0.000	0.801	1.248
	Hispanic	0.163	0.191	0.043	0.854	0.393	0.661	1.514
	Other	0.502	0.439	0.049	1.142	0.254	0.921	1.086

a. Dependent Variable: Intention

DISCUSSION AND CONCLUSION

The study investigated those potential consumers who have a high intention to purchase an automobile in Los Angeles County, the United States. The result concluded that race and age are influential factors that influence the purchase intention of consumers who are interested in purchasing an automobile. First, different races have different purchase intentions to purchase an automobile in terms of their age. For instance, the results show that Black consumers have a higher intention to purchase an automobile when compared with other races in Los Angeles County as shown in Table 3.

However, the income of consumers did not become a significant influence on purchase intention as shown in Table 3. The reason may be the price of an automobile was not too high for consumers to purchase in the United States to compare other countries such as Malaysia. For example, the price of a Toyota Camry 2.4V (Engine capacity: 2362cc) is RM174, 990 for individual private (UMV Toyota Motor, 2012). To calculate the exchange rate, US\$1.00 equals RM3.10. Therefore, the price is US\$54,448 in Malaysia. In the United States the price of a Toyota Camry 2.5L (Engine capacity: 2.5 Liter 4-Cylinder) is US\$21,995 (Toyota Motor USA, 2011). The details show that the price of an automobile in Malaysia is higher than the price in the United States.

Second, the study shows that age has a correlation with income as shown in Table 1. Specifically, the age of the consumer had an influence on the consumer's intention to purchase an automobile. Furthermore, the correlation between the age of consumers and their purchase intention was negative (Table 3). The negative age means that younger consumers have a higher intention to purchase an automobile than older consumers. Furthermore, Table 1 also points out consumer's income in terms of their age. Combining the data from Table 1 and Table 3, the study indicates younger consumers with less income have a higher intention to purchase an automobile when compared with older consumers who have more income.

In conclusion, the study shows that consumers of different races have different levels of intention to purchase an automobile. Furthermore, the age of consumers also influenced their purchase intention. Specifically, young consumers have a higher intention than older consumers. The reasons may be due to young consumers who have just graduated from college and are starting to work. They also may not have

an automobile. In other words, young consumers with less income have a higher intention to purchase an automobile because they need transportation between their home and work, and vice versa. Alternatively, although older consumers may have more income, they may already have an automobile. Their income may be spent on their family holdings such as a house loan or their children's education (Kotler & Keller, 2006). Therefore, they do not have a high intention to purchase an automobile when compared with younger consumers.

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