

# The Effects of Country of Origin on Consumer Willingness to Purchase General Motor Automobiles in the United States

Kenichiro Chinen<sup>1</sup>, Yang Sun<sup>1</sup> & Yuri Ito<sup>2</sup>

<sup>1</sup> College of Business Administration, California State University, Sacramento, Sacramento, California, USA

<sup>2</sup> Canon Singapore Pte Ltd, Singapore

Correspondence: Ken Chinen, College of Business Administration, California State University, Sacramento, Sacramento, California, USA. Tel: 1-916-278-6882. E-mail: chinenk@csus.edu

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## Abstract

This study is an examination of the effects of the country where products are made on the willingness of consumers to buy General Motor automobiles in United States. In order to provide some suggestions to financially struggling GM and other US automobile companies, survey data were collected from a sample (n=311) of consumers from northern California. We examined how US consumers evaluate GM automobiles that are made in US, Canada, Mexico, Japan, China and Germany, with respect to their perceptions of product evaluations and purchase intentions. This study shows that 'country image' influences consumer willingness to purchase automobiles. It also shows a general consensus that Japan and Germany would be capable of delivering quality automobiles. Just as corporations have brand images, countries have brand images. A positive image is a valuable asset for a country. We propose that GM enter into contract manufacturing, outsourcing the entire production, with quality leaders of automobiles manufacturers. Our suggestions would allow GM to focus on improving its innovative capability and technology and developing drastic marketing strategy.

**Keywords:** country of origin, general motors, manufacturing location, brand image, purchase intention, logistic regression

## 1. Introduction

After General Motors Corp. (GM) filed for Chapter 11 bankruptcy in 2009, it is on the way to recovery after paying back its loans of \$8.1 billion the U.S. and Canadian governments. However, the failure of GM, the world's largest automobile manufacturer for many decades, was shocking yet a foreseeable event. There are problems associated with producing many, often unprofitable, vehicles in 34 factories, employing insupportable workers around the world. It is reported that GM kept its high production and high dealer incentives in order to generate cash for the health care benefits. It seems that this high-cost organizational structure has contributed to its unfavorable brand image and serious sales decline. According to the Rasmussen Reports poll, which was conducted in March 2009, only 23% of US respondents had favorable opinions of GM. This number was 10% down from the poll conducted in February, 2009 and 37% down from the poll conducted in 2007 (Rasmussen Reports, 2009).

In order to save the troubling auto giant, Obama administration provided GM with tens of billions in federal loans. The taxpayer-funded bailout and the unfair terms offered to bondholders under the restructuring plan have been very controversial. Needless to say, GM's brand image has been negatively affected by the current crisis. In the process of reinvention, GM must make location decisions strategically. As shifting manufacturing to overseas be a huge investment, it is necessary to investigate the effect of a shift in manufacturing location on brand image before the actual investment is taken place (Johansson & Nebenzahl, 1986).

The present study investigated country of origin (COO) effects, which refer to the extent to which consumers depend on the image of a country associated with the product to evaluate the quality of the product and make purchase decisions (Loo & Davies, 2006). Specifically, we examined how US consumers evaluate GM automobiles made in US, Canada, Mexico, Japan, China and Germany, with respect to their perceptions of product evaluations and purchase intentions.

The outline of this paper is as follows. First, past research on COO and automobile productions in NAFTA, Japan and Germany, and China are reviewed. Then we present methods of the survey in this study and data analysis. In the last section, we provide conclusion and discussion of this study.

## **2. Country of Origin and Automobile Production**

### *2.1 Country of Origin and FDI*

While research on COO focuses on the strategic value of manufacturing location that affects consumers' purchase decisions, research on foreign direct investment (FDI) investigates the drivers behind the firms' location preference as destination for FDI. It is well documented that specific resources available in a manufacturing location attract FDI of firms that benefit from those resources (Dunning, 1998). For instance, firms seeking natural resources or access to a market might choose locations that help them achieve their objectives (Dunning, 1998). Hennart and Park (1994) point out that firms' investing strategies and benefits linked to a location interact in such a way that results in different location choices. It has been argued that for automobile manufacturers, existing supplier network and infrastructure are some of the key factors that determine the location choices of FDI (Depner & Bathelt, 2005). Those location specific factors are important since strategic location choice can deliver a competitive advantage to a firm. Ferdows (1997) indicated that FDI activities can enhance firms' competitiveness through the value-creating activities like forming a partnership with foreign manufacturers (Ferdows, 1997). Successful implementation of FDI requires firms to assess location specific factors in accordance with their investing strategies. It is imperative that GM is acquainted with the existing FDI patterns and automobile productions of each manufacturing country.

### *2.2 Productions in NAFTA*

The three economies of NAFTA have steadily produced automobiles. Mexico has remained a favorable manufacturing location for automakers mainly due to its low labor costs and the proximity to the US market. Since the establishment of NAFTA, Mexican automotive industry has experienced the rapid productivity growth. Faced by competition with Japanese firms, US auto manufacturers, such as GM have undertaken the large investments in Mexican auto industry (Carrillo, 2004). The development of Canadian automobile sector was also supported by NAFTA. In the 1990s, the Canadian automobile manufacturing sector prospered because of its significant labor cost advantage over the US and duty remission incentives offered by the Canadian government (Rutherford & Holmes, 2008). Japanese automobile manufacturers choose Canada as a strategically important manufacturing location for global operations. In fact, Toyota and Honda manufacture their luxury brands, Lexus and Acura, respectively, in Canada. Despite its segment-topping production of the Chevrolet Silverado, GM announced that it would close its Ontario, Canada due to overcapacity and profit declines.

### *2.3 Productions outside NAFTA*

#### *2.3.1 Japan and Germany*

Japan and Germany are characterized by the well-established auto manufacturers with the world-class reputation for high-quality vehicles. Both of these countries are dominant in the production of high-end automobiles. German auto industry is represented by the luxury car manufacturers like BMW and Mercedes Benz. Germany has been the leading automotive manufacturing location in Europe owing to its large investment in R&D. Japanese automakers such as Honda, Isuzu, Mazda, Mitsubishi, Toyota and Subaru have R&D facilities in Germany (Source: JAMA). Japan's developed manufacturing sector enables the production of high-quality vehicles. The innovative technology, especially alternative-fueled vehicles has given domestic auto manufacturers competitive advantage over their foreign counterparts. Japanese automobile manufacturers have formed extensive alliances with foreign manufacturers. According to the Japan Automotive Dealers Association (JADA), Isuzu and GM are engaged in a joint venture for the production of diesel engines in Moraine, Ohio (Source: JAMA). There is also a joint venture between Mazda and Ford based in Flat Rock, Miami. New United Motor Manufacturing Inc. (Source: NUMMI), a joint venture between GM and Toyota, in Fremont, California has produced over 6 million vehicles since its establishment in 1984 (Source: NUMMI). Yet, it was announced that Toyota would end production at this plant in March 2010.

#### *2.3.2 China*

Since the mid 1990s, China, with a vast pool of low-cost labor force, has transformed itself as an automobile manufacturing for both multinational and domestic companies. The fast development of auto manufacturing sector in China was strongly supported by the Chinese government's initiatives to boost the domestic auto industry (Depner & Bathelt, 2005). Toyota entered into Chinese automobile market in 2005 after Toyota group's auto-parts suppliers successfully launched productions there. Honda established its first automobile

manufacturing unit in 1998. Despite the traditional outlook of Europeans who considered “Made in China” as low quality, Honda became the first automaker to export cars manufactured in China to European countries. In 1994, GM entered the Chinese automobile market through joint ventures with seven Chinese companies. It was reported that GM would establish a wholly-owned R&D facility in China for the development of alternative power technology (Source: China Autos Report). In spite of its economic establishment as the third largest economy in the world, China does not yet have as mature a presence in international markets as the major industrial nations.

Those who believe that it is wrong to buy imports may not necessarily denigrate the quality of foreign goods, but would purchase domestic products to assist employment of workers whose jobs may be threatened by competing imports and believe this as a patriotic duty (Lande, 1995). Several studies conducted in different countries have posited that demographical, sociological, and psychological factors like age, gender, income, and political opinions directly or indirectly influence purchase intentions (Netemeyer et al., 1991; Mascarenhas & Kujawa, 1998; Klein & Ettenson, 1999; Maheswaran & Gurhan-Canli, 2000).

In order to provide some suggestions to financially struggling GM and other US automobile companies, we investigated if consumers’ willingness to buy GM-brand cars changes according to products’ country-of-origin. This study addresses the following questions:

- 1) Amongst US, Canada, Mexico, Japan, Germany and China, what is the preferred country of origin for GM-brand automobiles?
- 2) Who are potential consumers, and what are their beliefs or perceptions about foreign versus domestic products?

### 3. Survey Analysis Methodology

Survey data were collected from a convenience sample (n=311) of consumers from the capital city of California, Sacramento. A Likert scale (Likert, 1932) was used in the questionnaire; i.e., participants chose one of the following opinions to respond to most survey questions.

1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
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For each country of origin, i.e., US, Canada (CA), Mexico (MX), Japan (JP), Germany (GE) or China (CH), a key response is simply “how strong you are willing/unwilling to purchase a GM-brand car that is made in this country”. Figure 1 summarizes the average responses on the willingness of purchasing GM cars made in different countries. Clearly, in terms of purchasing willingness we have “JP = GE > US > CA = CH > MX”. There is no statistical difference between Japanese- and German-made GM cars, and between Canadian- and Chinese-made ones.

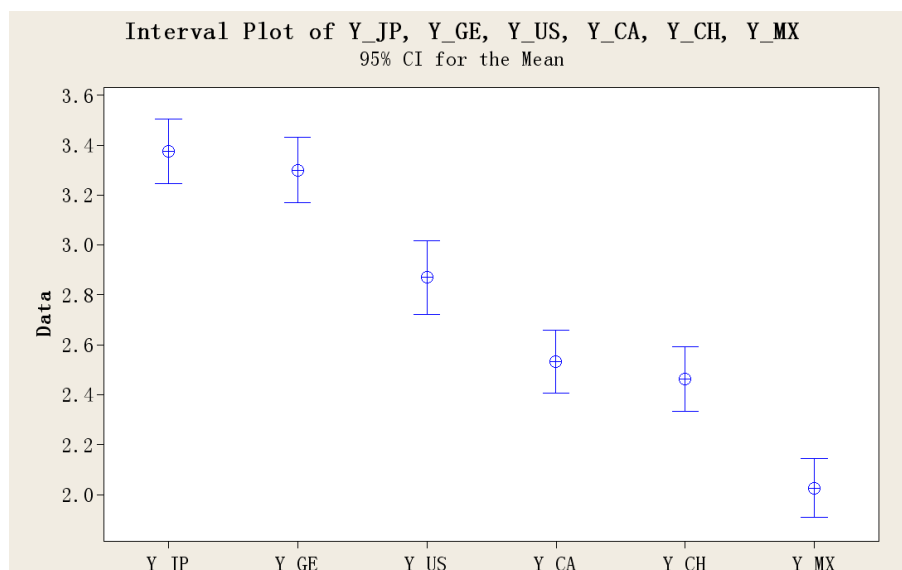


Figure 1. Average willingness of purchasing GM cars made in different countries

In order to find out what factors provide significant effects on the variation of consumers' attitudes towards different countries of origin, we use ordinal logistic regression to analyze the impact of selected independent variables on the likelihood of changes in the response variable, purchasing willingness. While the survey data are presented in a numerical fashion, i.e., as numbers between 1 and 5, the response variable is, in essence, categorical since participants have only 5 choices. Further, the response variable is an ordinal categorical variable with a natural order in which one (1) represents "strongly disagree" and five (5) represents "strongly agree". Logistic regression is superior to regular linear regression because in this case regular regression often results in models that violate some fundamental modeling assumptions such as having normally distributed residuals with constant variance. Using logistic regression also avoids situations in which an estimated response variable may be fractional that is difficult to interpret. See Myers *et al.* (2001) for details on logistic regression methodologies.

With a response variable  $y \in \{1, 2, 3, 4, 5\}$ , the logistic regression model is fit using an iterative-reweighted least squares algorithm to obtain maximum likelihood estimates of the parameters in the *logistic response*

functions 
$$P(y \leq y_j) = \frac{1}{1 + e^{-(\beta_{0j} + x'\beta)}}$$
, where  $P(y \leq y_j)$  is the probability of having a response of

$y \leq y_j$ .  $y$  is the response (dependent) variable, and  $y_j$  is the  $j$ th possible value of  $y$ ,  $j = 1, \dots, 5$ . Thus,  $P(y \leq y_j)$  is simply the probability that the consumer chooses a category of  $y_j$  or less for the corresponding survey question. For each individual category, we have  $P(y = y_j) = P(y \leq y_j) - P(y \leq y_{j-1})$ ,  $j = 2, \dots, 5$ .

In the logistic response function,  $x$  is a vector of independent variables selected in the regression model;  $\beta$  a vector of parameters (coefficients) in correspondence with the selected variables;  $\beta_{0j}$  a constant for each  $j$ . Note that for different  $j$ 's, only the values of  $\beta_{0j}$  are different in the response function and the remaining regression parameters are the same.  $\beta_{0j}$  is conceptually similar to the intercept in a regular linear regression model while  $(\beta_{0j} + x'\beta)$  is, in essence, the linear predictor, which can be defined by the *logit transformation*

$$\frac{\beta_{0j} + x'\beta}{P(y > y_j)} = \frac{\ln(P(y \leq y_j))}{1 - P(y \leq y_j)} = \frac{P(y \leq y_j)}{P(y > y_j)} = e^{\beta_{0j}} e^{x'\beta}$$
 are called the **odds**. It is

straightforward to see that the odds for different  $j$ 's are proportional since  $e^{\beta_{0j}}$  are constants. An important statistic we obtain from a logistic regression analysis is the *odds ratio*. An odds ratio corresponds to a particular

independent variable  $x_i$  and is defined as 
$$OR_i = \frac{odds_{x_i+1}}{odds_{x_i}} = e^{\beta_i}$$
. It can be interpreted as the increase in the

odds associated with a one-unit change in the value of the corresponding independent variable  $x_i$ . The following two tests of significance are therefore equivalent. These are called the Wald tests.

$H_0: \beta_i = 0$  vs.  $H_a: \beta_i \neq 0$

$H_0: OR_i = 1$  vs.  $H_a: OR_i \neq 1$

With a large pool of candidate independent variables, a major procedure in regression model building is variable selection so that the "most appropriate" regression model can be built. While there is no unique definition of "most appropriate", in this study we select independent variables such that 1) selected independent variables are not strongly correlated (otherwise some variables are no longer "independent"), 2) all selected variables provide a significant contribution to the variation in the response variable  $y$ , and 3) the model built fits well with the data. The multicollinearity issue (1) can be taken care of by performing a correlation analysis among independent variables. Significance (2) and goodness-of-fit (3) are indicated in the logistic regression computer output.

For example, for GM cars labeled as “Made in China”, a list of candidate independent variables is provided in Table 1. After the variable selection procedure, the following variables turn out to have a significant effect on consumers’ purchasing willingness. Final regression output is presented in Table 2. It is clear that all selected variables are significant at a 95% significance level with their 95% CI’s of the odds ratios (OR’s) excluding the ratio 1. All other variables have no significant effect on US consumers’ purchasing attitude towards Chinese-made GM cars and are therefore removed. The deviance goodness-of-fit test has also shown that the logistic regression model fits well with the data.

Table 1. A list of variables for GM-brand cars made in China

<b>Dependent (Response) Variable</b>	<b>Y_CH: The response to “I am willing to purchase “Made in China” GM-brand car.”</b>
<b>Candidate Independent Variables</b>	<p><b>Age.</b> The participant’s age.</p> <p><b>Gender.</b> The participant’s gender.</p> <p><b>Citizen.</b> Whether the participant is a US citizen or not</p> <p><b>PoliticalView.</b> The participant’s political view (democratic, republican, or others).</p> <p><b>Income.</b> The participant’s household income.</p> <p><b>Education.</b> The participant’s education level.</p> <p><b>Ethnocentrism01.</b> The response to “It is not right to purchase foreign cars, because it puts Americans out of jobs.”</p> <p><b>Ethnocentrism02.</b> The response to “A real American should buy US-automobiles.”</p> <p><b>Ethnocentrism03.</b> The response to “We should purchase automobiles “Made in US” instead of letting other countries get rich off of us.”</p> <p><b>Government01.</b> The response to “US government should bail out financially troubled US automobile manufacturers.”</p> <p><b>Government02.</b> The response to “US government should increase the tariff rate on imported foreign cars.”</p> <p><b>Government03.</b> The response to “US government should discourage foreign car manufacturers to build their factories in the US because such investment activities may drive US car manufacturers out of business.”</p> <p><b>CH01.</b> The response to “GM-brand car, labeled as “Made in China”, is reliable.”</p> <p><b>CH02.</b> The response to “GM-brand car, labeled as “Made in China”, is carefully built.”</p> <p><b>CH03.</b> The response to “GM-brand car, labeled as “Made in China”, has good design.”</p> <p><b>CH04.</b> The response to “GM-brand car, labeled as “Made in China”, is safe.”</p> <p><b>CH05.</b> The response to “GM-brand car, labeled as “Made in China”, is fuel efficient.”</p> <p><b>CH06.</b> The response to “GM-brand car, labeled as “Made in China”, is comfortable.”</p> <p><b>CH08.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is making the best choice.”</p> <p><b>CH09.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is a gambler.”</p> <p><b>CH10.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is paying top price for top quality.”</p> <p><b>CH 11.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is a poor person.”</p> <p><b>CH 12.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is getting a good deal.”</p> <p><b>CH 13.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is ignorant, foolish.”</p> <p><b>CH 14.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is a lower class person.”</p> <p><b>CH 15.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” does not care about quality.”</p> <p><b>CH 16.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” is getting ripped off.”</p> <p><b>CH 17.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” demands high quality.”</p> <p><b>CH 18.</b> The response to “A person who buys GM-brand car, labeled as “Made in China” will be dissatisfied.”</p>

Note that all countries of origin have basically the same set of variables.

Table 2. Sample logistic regression output on GM cars made in China

Ordinal Logistic Regression: Y_CH versus Age, CH08, CH12, CH13							
Link Function: Logit							
Response Information							
Variable Value Count							
Y_CH	5	14					
4	41						
3	93						
2	81						
1	78						
Total	307						
* NOTE * 307 cases were used							
* NOTE * 4 cases contained missing values							
Logistic Regression Table							
					Odds	95% CI	
Predictor	Coef	SE Coef	Z	P	Ratio	Lower	Upper
Const(1)	-9.33560	0.789005	-11.83	0.000			
Const(2)	-7.00739	0.670800	-10.45	0.000			
Const(3)	-4.43837	0.586815	-7.56	0.000			
Const(4)	-2.35363	0.550760	-4.27	0.000			
Age	-0.131556	0.0577787	-2.28	0.023	0.88	0.78	0.98
CH08	1.36497	0.163972	8.32	0.000	3.92	2.84	5.40
CH12	1.03557	0.161109	6.43	0.000	2.82	2.05	3.86
CH13	-0.636382	0.121239	-5.25	0.000	0.53	0.42	0.67
Log-Likelihood = -319.889							
Test that all slopes are zero: G = 263.489, DF = 4, P-Value = 0.000							
Goodness-of-Fit Tests							
Method	Chi-Square	DF	P				
Deviance	377.12	572	1.000				

- Age: Negative effect. Interestingly, younger people are more willing to buy Chinese-made GM cars.
- CH08: Positive effect. People who strongly agree that “a person who buys Chinese-made GM cars is making the best choice” are more willing to buy Chinese-made GM cars. The corresponding high OR can be interpreted as that, if the consumer agrees to this statement with one higher level, it is nearly four (4) times more likely that this consumer is willing (over unwilling) to purchase a GM car made in China.
- CH12: Positive effect. People who strongly agree that “a person who buys Chinese-made GM cars is getting the best deal” are more willing to buy Chinese-made GM cars. (Note that the Pearson correlation between variables CH08 and CH12 is not strongly enough to cause a multicollinearity problem and thus both variables can be included in the regression model.)
- CH13: Negative effect. People who are ignorant or foolish are less willing to buy Chinese-made GM cars. The OR of 0.42 indicates that a more ignorant or foolish person (with one higher level) is over two (2) times less likely to be willing (over unwilling) to purchase a Chinese-made GM car.

Tables 3-6 summarize major findings from the logistic regression study with respect to the effects of independent variables on US consumers' purchasing attitude towards different countries of origins of GM-brand automobiles. This leads to our conclusions in the following section.

Table 3. What affect US consumers' willingness to buy GM-brand cars made in Japan and Germany

People who do NOT think that the government should bail out US automakers have a better attitude towards buying a Japanese-made GM car. Reliability is still the No.1 attraction factor of Japanese-made cars. Good design of Japanese-made cars is also a significantly positive factor. In addition, it appears that buying a Japanese-made GM car is the best choice and is never a getting-ripped-off.

Interestingly, people who believe that they should purchase automobiles "Made in US" instead of letting other countries get rich off of Americans are more willing to buy German-made cars. While reliability is still the top concern, people buy German-made cars mostly because of the luxury features.

Logistic Regression Table (JP)

Predictor	Coef	SE Coef	Z	P	Odds 95% CI		
					Ratio	Lower	Upper
Gov01	-0.361317	0.146643	-2.46	0.014	0.70	0.52	0.93
JP01	0.918481	0.187310	4.90	0.000	2.51	1.74	3.62
JP03	0.737631	0.178345	4.14	0.000	2.09	1.47	2.97
JP08	0.991037	0.162187	6.11	0.000	2.69	1.96	3.70
JP16	-0.338240	0.120179	-2.81	0.005	0.71	0.56	0.90

Log-Likelihood = -322.670

Test that all slopes are zero: G = 274.244, DF = 5, P-Value = 0.000

Goodness-of-Fit Tests

Deviance 426.95 547 1.000

Logistic Regression Table (GE)

Predictor	Coef	SE Coef	Z	P	Odds 95% CI		
					Ratio	Lower	Upper
Eth03	0.397595	0.149950	2.65	0.008	1.49	1.11	2.00
GE01	1.13603	0.201772	5.63	0.000	3.11	2.10	4.63
GE05	0.405634	0.166417	2.44	0.015	1.50	1.08	2.08
GE06	1.04681	0.187331	5.59	0.000	2.85	1.97	4.11
GE08	0.871501	0.231446	3.77	0.000	2.39	1.52	3.76
GE10	0.368538	0.164412	2.24	0.025	1.45	1.05	2.00
GE12	0.344928	0.163870	2.10	0.035	1.41	1.02	1.95

Log-Likelihood = -270.638

Test that all slopes are zero: G = 374.771, DF = 7, P-Value = 0.000

Goodness-of-Fit Tests

Deviance 492.63 857 1.000

Table 4. What affect US consumers' willingness to buy GM-brand cars made in the US

The "real American" image still has a positive effect on consumer's attitude towards US-made GM cars. People who agree stronger that a real American should buy US cars is 1.4 times more likely to be willing to buy US made GM cars. GM should maintain a marketing strategy to keep Americans be proud of their locally made cars. They should also make efforts to reduce the image that people who buy US-made GM cars are gamblers or are getting ripped off.

Improved quality images on reliability, good design, safety, and fuel efficiency will attract consumers to buy US-made GM cars. Particularly, a better reliability (+1 level) leads to a 2.37-time more likelihood of buying. These should be highlighted in future developments of US-made GM cars.

## Logistic Regression Table (US)

Predictor	Coef	SE Coef	Z	P	Odds	95% CI	
					Ratio	Lower	Upper
Eth02	0.338213	0.157069	2.15	0.031	1.40	1.03	1.91
US01	0.862509	0.172094	5.01	0.000	2.37	1.69	3.32
US03	0.594752	0.161600	3.68	0.000	1.81	1.32	2.49
US04	0.350634	0.168406	2.08	0.037	1.42	1.02	1.98
US05	0.356797	0.132939	2.68	0.007	1.43	1.10	1.85
US09	-0.445492	0.125969	-3.54	0.000	0.64	0.50	0.82
US16	-0.282916	0.116612	-2.43	0.015	0.75	0.60	0.95

Log-Likelihood = -353.028

Test that all slopes are zero: G = 273.069, DF = 7, P-Value = 0.000

## Goodness-of-Fit Tests

Deviance 643.96 957 1.000



Table 5. What affect US consumers' willingness to buy GM-brand cars made in China and Canada

Interestingly, younger people are more willing to buy Chinese-made GM cars. People who strongly agree that "a person who buys Chinese-made GM cars is making the best choice" are nearly four (4) times more likely to purchase a GM car made in China. People who strongly agree that "a person who buys Chinese-made GM cars is getting the best deal" are over two (2) times more likely to purchase a GM car made in China. Promotions and deals should be highlighted in GM's future marketing strategy when launching Chinese-made GM cars in the US market. In addition, people who are ignorant or foolish are over two (2) times less likely to be willing to buy Chinese-made GM cars. People who do NOT think that the government should bail out US automakers' financial troubles have a better attitude towards buying a Canadian-made GM car. Similar to other countries of origin, quality features such as reliability can be the top attraction factor of Canadian-made GM cars. Similar to Chinese-made GM cars, marketing strategy should highlight that buying a Canadian-made GM car is a great choice rather than is getting ripped off.

## Logistic Regression Table (CH)

Predictor	Coef	SE Coef	Z	P	Odds 95% CI		
					Ratio	Lower	Upper
Age	-0.131556	0.0577787	-2.28	0.023	0.88	0.78	0.98
CH08	1.36497	0.163972	8.32	0.000	3.92	2.84	5.40
CH12	1.03557	0.161109	6.43	0.000	2.82	2.05	3.86
CH13	-0.636382	0.121239	-5.25	0.000	0.53	0.42	0.67

Log-Likelihood = -319.889

Test that all slopes are zero: G = 263.489, DF = 4, P-Value = 0.000

## Goodness-of-Fit Tests

Deviance 377.12 572 1.000

## Logistic Regression Table (CA)

Predictor	Coef	SE Coef	Z	P	Odds 95% CI		
					Ratio	Lower	Upper
Gov01	-0.346206	0.143746	-2.41	0.016	0.71	0.53	0.94
CA01	1.49783	0.173314	8.64	0.000	4.47	3.18	6.28
CA08	0.740353	0.148435	4.99	0.000	2.10	1.57	2.80
CA16	-0.460576	0.109163	-4.22	0.000	0.63	0.51	0.78

Log-Likelihood = -344.617

Test that all slopes are zero: G = 212.662, DF = 4, P-Value = 0.000

## Goodness-of-Fit Tests

Deviance 339.97 416 0.997

Table 6. What affect US consumers' willingness to buy GM-brand cars made in Mexico

Mexican-made GM cars can become appealing only if they can significantly improve their quality image, especially reliability, and therefore appear as a good choice.

Logistic Regression Table (MX)

Predictor	Coef	SE Coef	Z	P	Odds Ratio	95% CI	
						Lower	Upper
MX01	1.41916	0.173826	8.16	0.000	4.13	2.94	5.81
MX08	1.13445	0.173500	6.54	0.000	3.11	2.21	4.37

Log-Likelihood = -299.853

Test that all slopes are zero: G = 228.860, DF = 2, P-Value = 0.000

Goodness-of-Fit Tests

Deviance 89.407 70 0.059

#### 4. Conclusion

As one of the few major automobile manufacturers in the world, GM enjoyed the peak of its prosperity, power and glory in the 1960s. Back then, consumers accepted whatever Detroit designed and manufactured. But since the mid 1970s, foreign competitors have rapidly gained an increasingly large share of the world automobile market for a number of reasons as US automobile brands have lost their first-mover popularity. James P. Womack (2006), a management expert and a lecturer at MIT, questions GM's ability to design vehicles that consumers want, work well with their suppliers, give up 'miasmic' management cultures, focus on winning brands, and treat customers as friends who might engage in more than one-time transactions. In the land of the Big Three, the European and Asian automakers have set-up facilities and manufacture reliable cars with better gas mileage and lower labor costs, employing American workers and using parts mainly made in North America.

This study investigated the extent to which the place of manufacturing influences product evaluations. Specifically, we examined how US consumers evaluate GM automobiles that are made in US, Canada, Mexico, Japan, China and Germany, with respect to their perceptions of product evaluations and purchase intentions. Such a product-focused investigation is important because effects of COO are product specific.

Results of this study show a general consensus that Japan and Germany would be capable of delivering quality automobiles. We offer suggestions of manufacturing locations from a COO perspective for GM automobiles exclusively for the US market.

##### 4.1 Production in Japan and Germany

With regard to productions in Japan and Germany, we propose that GM enter into contract manufacturing, outsourcing the entire production, with quality leaders of automobiles manufacturers. Many global-market Chevrolet vehicles are sourced from GM Daewoo in South Korea. Product images of "Made in South Korea" have significantly improved over two decades, especially after hosting an Olympic games in 1980s (Jaffe & Nebenzahl, 1993), but not to the extent that it can draw customers' great attentions without offering warranty programs. While a Japanese automobile company Suzuki assembles and markets the Chevrolet Cruze and the Chevrolet MW kei car, Toyota has announced to end the long-time joint project with GM in Fremont, California in 2010. Yet, benefits for GM to choose Japan and Germany as locations for their final points of manufacture, capitalizing on high quality image, would be immense. Japan and German automakers have both technological and management know-how to lead the world automobile industry. They have skilled labor and the infrastructure necessary to compete in an automobile industry, strong rivalries in home countries, picky and demanding customers, and supporting supplier industries (Porter, 1991). The contract manufacturing may not guarantee commitment of volumes, possibly leading to an inability to engage in global strategic coordination. However, we firmly believe that contract manufacturing with Japanese and German companies can be an excellent option for GM because it can enhance product quality images and increase purchase intentions in the minds of consumers, as reported in this study. The option can also enable GM to focus on product development and marketing strategy, the two core functions that create differentiation. Results of this study also suggest that US consumers

can be segmented by their opinions toward bailing out financially troubled automakers; consumers who do not think that government should bail out automakers, compared to those who support government bailout, have a better attitude towards buying GM cars regarding “Made in Japan” label.

#### *4.2 Production in NAFTA*

This study has showed poor perceived product quality and low purchase intention of automobiles “Made in Mexico.” Perhaps, it is a good strategy for GM to label “Made in Mexico” for middle or lower class cars, but not for higher-class vehicles because of the strong association between the class/price and quality in the Mexico (Chinen et al., 2000).

Toyota and Honda manufacture their luxury brands, Lexus and Acura, respectively, in Canada and export them to very demanding Japanese customers. GM can use Canadian label for middle to higher class cars. It seems that Canadian government would be well advised to take measures to enhance the image of Canada as a country that can manufacture top quality products if they wish to make inroads in today's demanding and highly competitive markets. This study has found that consumers who do not think that government should bail out automakers have a better attitude towards buying GM automobiles regarding “Made in Canada” label.

In the US, “the conventional wisdom holds that the structure of an economy, what it makes, and the services it provides are not terribly important and should not be the subject of government policy. According to this view, linkages between industries and technologies are unimportant, and technology development is independent of manufacturing and production” (Prestowitz, 2005:18). Hence, the US manufacturing sector in general is losing out to foreign competitors. There is no time for GM to repeat notions “that foreign markets are not open, that international trade rules are flouted, that currency values are manipulated, or that proprietary technology is stolen” (Duesterberg, 2003:2). It is a time for GM to apply global learning from numerous alliances, design vehicles that consumers want, work well with their suppliers, grow out of ‘miasmic’ management cultures, and focus on appealing brands to regain its confidence amongst global consumers (Womack, 2006). This study shows that improved images on design, safety, fuel efficiency, and especially reliability will attract American consumers to buy locally made GM cars.

#### *4.3 Production in China*

The traditional notion of American customers that “Made in China” goods are of inferior quality, reported also in this study, might affect GM's prospects in the US. However, world-class automobile companies have invested in China to manufacture and even export products to Europe, demonstrating China's ability to deliver quality products if managed in the approved manner. In the 2008 Olympic, particularly in opening and closing ceremonies, China has successfully advertised its image as high-tech and innovative country and created the perception that deserve world attentions. It needs to be noted, however, that in order for GM to continue to use China as one of its manufacturing locations, China needs to handle domestic demonstrations, riots, and the like, peacefully because these incidents can be broadcasted and likely influence world opinions and its country image. This is important aspect because “changes in attitudes toward a country result in parallel affective and cognitive attitudinal changes toward its products” (Jaffe & Nebenzahl, 1993:447). Nonetheless, Chinese-made GM-brand cars have gained great reputation in the Chinese market and recently experienced a record high, 50% year-to-year sales increase in China (Ho, 2009). As China gains better international reputation as a country of high quality producer, GM can use Chinese label for more cars in the US market. Results of this study show that people who are willing to buy Chinese-made cars seek good deals and place smart purchases. Results also suggest that US consumers can be segmented by age group; younger US consumers, having less purchasing power, show a better attitude towards buying GM cars regarding “Made in China” label.

If Womack's claim is correct, that is, if GM has not been able to offer enough products that would excite US customers at least for the last ten years, then its ‘inflated’ sales in the most of 2000s which relied on an unsustainable debt load of consumers (Panzner, 2008) based on their optimistic and unrealistic assumptions that the economy would invariably get better did not help GM's management draw correct paths on its strategic map. GM, staggering under the costs of providing post-employment benefits for their workers and retirees and with few cars that thrill consumers, is clearly struggling to compete against their Japanese, European and South Korean rivals.

In conclusion, in this paper we offered GM some suggestions regarding locations of manufacture specifically for the US market: contract manufacturing with Japanese and German car manufactures; reconsideration of Canada and China as important points of manufacturing; and careful selection of models assembled in Mexico. We suggest GM to carefully reduce manufacturing locations to cut costs, but not to the extent that it fails to understand what customers want because “national products may not have universal appeal because of the

existence of consumer segments” (Jaffe & Nebenzahl, 2006:108). Many of respondents in this study agreed that US government should not bail out financially troubled US automobile manufacturers regardless of their political beliefs. Perhaps, they reflect a general consensus that the overextended lending arms of automakers should be forced to shut their doors even if it leads to spiraling unemployment and growing market upheaval (Panzner, 2008). In the face of a struggling economy, organizational ability to translate ideas into commercial products is critical not only to organizational success, but also to its survival, because product innovation and technology of rivals can make your products less competitive, or often obsolete. Our suggestions would allow GM to focus on improving its innovative capability and technology, and developing drastic marketing strategy.

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