

The 2008 Global Financial Crisis Post-Recession Impact on Consumer Behavior Based on Educational Level

Joseph W. Gilkey Jr. and Sylvia D. Clark

Abstract—An extraordinary economic event which forced significant transformations in consumer behavior, the global recession in 2008 significantly eroded consumer confidence, and the impacts, as reflected in various components of consumer economics, will be long-lasting. Changes in consumer patterns as a result of major economic events have been researched from many different vantage points: volume of consumption, nature of consumer expectations, overall consumer confidence, and advertising budgets. This study examines the extent of this economic event's impact as it relates to the sales of beer products and based on the education level of the household head. The results lead to potential predictive identifiers upon consumer behavior impacts by education level, shown to lead to a positive impact on the quality products and a negative impact on the frequency of purchase.

Index Terms—Consumer behavior, consumer confidence, consumer demographics, consumer marketing.

I. INTRODUCTION

The research tested hypotheses covering consumption of beer product between 2003 and 2011, focusing on the variable of household head's education level. They were:

- Stores had substantial change in their annual sales pre- vs. post-recession.
- The recession had substantial impact on the consumption of quality products by consumers with higher education levels after the recession.
- The recession had no impact on consumption of quality products by consumers with higher education levels after the recession.

A. Justification for Study

In a recession such as the 2008 economic event, households were forced to re-examine at the utility function of the purchases they made. Consumers, were faced with reduced consumption budgets during the recession, and as a result, cut expenditures disproportionately on nonessential categories, resulting in smaller shares for those categories and larger shares for more essential product needs. An earlier study [1] explores the allocation of expenditures being affected by economic conditions. When the economy starts to grow again, consumers are expected to increase both their total consumption budget and shares allocated to the less essential product categories. In addition, the growth of private labels

over the past few decades can be attributed to a number of different factors (Lamey *et al.*, 2007) [2], especially those which address a link between private-label success and economic contractions. The findings confirm conventional wisdom that a country's private-label share increases when the economy is suffering and shrinks when the economy is flourishing (Lamey *et al.*, 2007) [2]. The switch to private-label brands occurs more quickly than the opposing shift to national brands after the recession ends. It is also clear that some consumers continue to purchase private-label products after the recession has ended.

There has been research seeking to narrow the gap for purposes of improving predictive capabilities especially during significant downturns. One study (Du & Kamakura, 2012) [3] builds, for example, on the earlier work of Deaton and Muellbaures (1980) [4], following a traditional economic analysis utilizing data about household consumption of various commodities at different levels of expenditure, independent of economic conditions. Based on this research, one could proceed with testing the proposition that when consumers face a reduced consumption budget during a recession, they could be expected to cut expenditures disproportionately more in less essential product and commodities categories. This would then allow them to dedicate proportionately larger shares to purchasing products and commodities they deem most essential for their households. The combination of the above-mentioned studies suggests a structural budget allocation model by including per capita GDP growth rate as a proxy for economic conditions along with sociological and demographic attributes. This combination could influence consumers' own perceptions about underlying utilities associated with their buying behavior.

With personal consumption reaching more than 70 percent of real GDP in the United States for the first time in history, this type of research carries unprecedented significance and relevance. This study incorporates robust data sets that cover 10 years (2001 through 2011) for sales data from more than 1,500 outlets covering 47 states across the United States. In addition, an online focus group was administered that included a survey of 17 questions to gauge consumer perceptions and behavior to understand the changes in patterns and purchasing decisions. In addition to the above mentioned information, economic data were added in the form of real GDP and consumer sentiment index numbers. These figures were based on the product having a 30 percent or greater share in market penetration in order to be considered a quality product.

This distinction of quality products also would help to gain insights into the purchase patterns and changes, as well as an

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opportunity to see whether the changes in trends might suggest a permanent shift in consumer behavior. The movement to or from quality products is one key factor to understanding these changes in consumer behavior. This is a significant area in comprehending the consumer's mindset because it also brings in earlier work (Heffetz, 2011) [5] about the foundations underlying the relative cultural visibility of different consumer expenditures. Heffetz (2011) [5] demonstrated that the visibility measure could help to explain up to one-third of cross-goods heterogeneity in income elasticities. In addition, the frequency of purchase was considered, along with the demographic attribute – that is, head of household education. The demographic impacts become increasingly more important even as consumer sentiments and expectations have recovered yet consumer behavior patterns observed during the recession still remain.

II. METHODOLOGY

The research encompassed a triangulation of quantitative and qualitative methods to develop models for applicable strategic marketing purposes, as they explore the challenges of responding sensitively to changes in consumer behavior paralleling changes in economic conditions.

A. Data Selection

The Information Resources, Inc. (IRI) data set, specifically designed for academic research purposes, is suited for longitudinal analysis over an eight-year timespan because it incorporates a wide range of products, varied geographic areas, and for the ability to combine demographic consumer data with sales information. The sales data for all locations were arranged by category and product to discern market penetration of beer products, and determine which ones had greater than 30 percent market share, indicating as a quality product. The models were developed using IRI data from 47 markets across the country, covering scan sales data from more than 1,500 outlets for 30 consumer products, spanning the years 2003 to 2011. (Note: three of the markets were removed because the penetration levels of stores would have revealed the identity of the stores)

The online survey comprised 17 questions based on the results from the quantitative study carried out on the IRI data to help gauge consumer perceptions and purchase patterns. Administering this survey in 2014 also offered the capability to discern with the trends observed in the IRI data are still in force today. The survey generated data from 124 respondents, including individuals from 38 states, which provided a sufficiently wide geographic sampling. Survey respondents represented a good cross-section of age and income categories as well as education levels.

For the datasets involved AIC/BIC¹ comprised the

comprised the criterion-based procedures to yield the best fitted, model for linear regression models. The high-dimension data reduction was accomplished using stepwise regression with forward and backward methods. This reduced the number of predictors which did not have an effect or influence on the response variables.

B. Model Design

The model developed includes a binary variable, HH_EDU, defined as 0 if the sample observation is in the pre-recession period, or 1 if the observation is in the post-recession period. The second model run ignored the intercept to offer a better fit with the data.

To investigate the change in effect of “HH_EDU” on the quality of the product consumed, the following formula (1) applies:

$$\text{QUALITY} = \beta_0 + \delta * \text{RE_PERIOD} + \beta_1 * \text{HH_EDU} + \gamma * \text{RE_PERIOD} * \text{HH_EDU} + \mu. \quad (1)$$

Thus, the expected quality measure (2), given household size in the pre-recession period, will be:

$$E [\text{QUALITY}_0 | \text{HH_EDU}] = \beta_0 + \beta_1 * \text{HH_EDU}. \quad (2)$$

Then, the expected quality measure (3), given household size in the post-recession period, will be:

$$E [\text{QUALITY}_1 | \text{HH_EDU}] = (\beta_0 + \delta) + (\beta_1 + \gamma) * \text{HH_EDU}. \quad (3)$$

The expected quality measure in the pre-recession period (4) with a controlled effect for household head education level will be:

$$E [\text{QUALITY}_0] = \beta_0. \quad (4)$$

The expected quality measure in the post-recession period (5) with a controlled effect for household size will be:

$$E [\text{QUALITY}_1] = \beta_0 + \delta. \quad (5)$$

To find the corresponding change (6), if any, in effect of household size on the quality of product pre- vs. post-recession, the following will be considered:

$$\begin{aligned} & (E[\text{QUALITY}_1 | \text{HH_EDU}] - E[\text{QUALITY}_1]) - (E[\text{QUALITY}_0 | \text{HH_EDU}] - E[\text{QUALITY}_0]) = \\ & \{(\beta_0 + \delta) + (\beta_1 + \gamma) * \text{HH_EDU} - (\beta_0 + \delta)\} - \{(\beta_0 + \beta_1 * \text{HH_EDU}) - \beta_0\} = \gamma * \text{HH_EDU}. \end{aligned} \quad (6)$$

¹ For this dataset AIC/BIC was one of the best criterion-based procedures to get the best fitted model especially for linear regression models. Based on the data, minimum description length (MDL) was not needed for this type of dataset. The high dimension data reduction was accomplished using stepwise regression with forward and backward methods. This reduced only those predictors which did not have an effect or influence on the response variables. This was done to ensure that the results were not inaccurately

impacted. The high dimension data reduction step increased the complexity of the underlying model or algorithm. With the complexity increasing the p potential predictors where observed, then there are 2^p possible modes to be tested and only those predictors remained in the data that were observed to have high significant levels of effect on response variables.

III. RESULTS AND DISCUSSION

Significant change was again found in the effects of period, week, dollar, education, and units in frequencies of purchase. In examining the week of transaction, both effects shifted from negative to positive on the frequency of purchase. Higher level of education was associated with more frequent consumption of quality products becoming more frequent ($t = 12.160$, $R^2 = 0.2406$, $p < 2.2e-16$).

TABLE I: BEER PRODUCT PURCHASES

	Model 1	Model 2
Intercept	0.47110***	
Week	-0.00022***	
	-0.16100***	
Re-Period	-0.13650***	0.00009***
Dollars	0.01834***	0.01856***
HH_Edu	-0.02571***	
	-0.02250***	
Dollars:Units	-0.03651***	
	-0.00371***	
RE_Period:HH_Edu	0.03583***	0.03244***

Regarding beer, there are numerous significant impacts to be observed from the 2008 recession regarding. As is shown in Table I, significant negative changes were seen frequency for week, period (RE_PERIOD), education (HH_EDU), and units (DOLLARS:UNITS), while a positive change is noted (DOLLARS). The frequency of purchase would be expected, as tightening of consumer budgets occurs during a recession as deep as the 2008 event. This pattern is based on economic studies on budget-specific issues that relate to total consumption expenditures change as functions of economic conditions (Jappelli & Pistaferri, 2010 [6]; Parker & Vissing-Jorgensen, 2009 [7]). These studies were based on traditional economic analytical assumptions indicating that the specific utility a household derives from each of various commodities at different levels of expenditure would be independent of economic conditions.

Segmentation is the key consistently seen in the results, and education level appears to have engendered the most consistent statistically-significant impacts for predicting consumer behavior during and after the recession. A significant background factor is overall labor force participation, with highest levels reported for those holding a bachelor's degree or higher (88.1 percent for ages 20-24 and 82.1 percent for ages 25-64, verses to 46.1 percent for ages 20-24 and 54.9 percent for ages 25-64 who did not complete high school.

It is worth examining beer in greater depth. Beer is a highly visible product when served by consumers to friends, family, and guests in their homes or in restaurants, bars, clubs and taverns. The visibility impact of this product can enhance market pressures on the quality beer product, especially with regard to the desire to be viewed as conveying positive attributes of consumer status and perception.

Fig. 1 depicts beer sales in total annual volume and market share of quality products during 2001-2011. In assessing the impact of the 2008 recession on quality beer products over time, sales had recovered to within 4.2 percent of pre-2008

levels by 2011. The 2008 data were removed, because the values were too extreme in the immediate week of the recession. The average is calculated from the years 2001 through 2007, and the 2011 sales number moves to within 3.1 percent of this average. At the start of the recession, there was a drop of 28.2 percent (2008 vs. 2009), clearly showing the impact of the 2008 recession, on consumer behavior, and explaining, at least in part, the reason that sales are still down 4.2 percent from pre-recessionary levels.

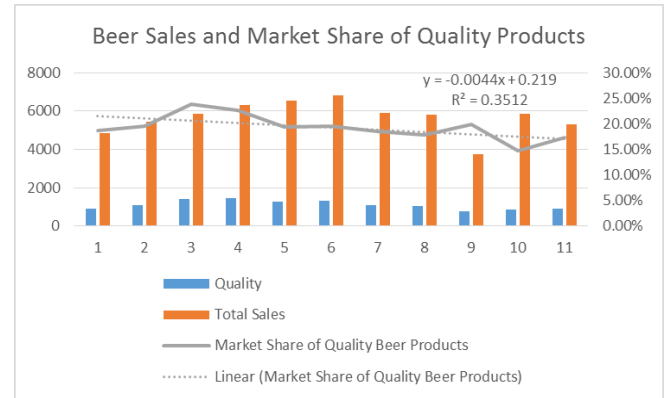


Fig. 1. Beer sales in total annual volume and market share of quality products, 2001-2011.

Although the correlation is modest at best, the volatility triggered by the recession likely had a significant enough impact to become a useful predictor. The relationship between total sales and quality sales has an appreciably stronger, if still modest, predictable relationship, as shown in the equation: $y = 2.8778x + 2523.4$ $R^2 = 0.6197$ (Fig. 2). The red data point (Fig. 2) indicates the comparable impact of the recession relative to beer sales in other years.

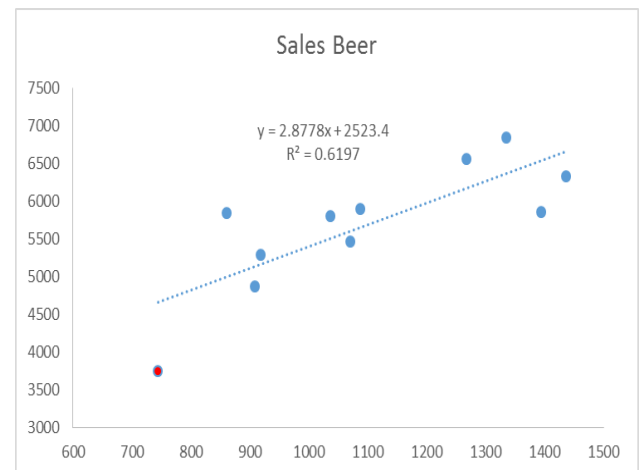


Fig. 2. Annual beer sales compared to plotted equation points, 2001-2011.

IV. CONCLUSION

Beer, as presented in this study, provides an instructive example for marketing strategists. An area for further research will be to assess the impact of a broad range of demographic attributes to understand and explore whether a new permanent baseline has been established, and to see whether specific responses correlate with the consumer's acknowledgement of shifts in macro-level economic conditions.

Taking into account how families cut their household

budgets during the 2008 recession, the analysis suggests a couple of trends that have emerged. First consumers chose to entertain more frequently at home. Second they comprised their purchase behaviors, by buying upscale products to impress their guests, yet serving them at home, conform to their recently constrained budgets. This pattern allows consumers to entertain by serving meals and drinks at home with families and friends, enhancing the quality of time spent together. These changing trends suggest a market environment where the products purchased to make the in-home hospitality experience more appealing can become more significant for consumer perceptions. Yet, advertisers often bypass the full range of those demographic variables that explain how so many consumers responded to a deep recession in distinct, even nuanced, ways. Today, consumer satisfaction relies on, models dramatically different from those applied prior one to recent most severe recessions. These trends will continue to modulate and revise and businesses must respond accordingly.

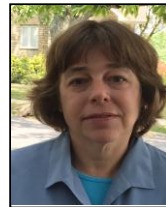
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