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Consumer Spending on Entertainment and the Great Recession

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Abstract

This paper empirically investigates the effects of economic recessions on consumers' decision-making process for entertainment activities using the Consumer Expenditure Survey (CES) data during the Great Recession that began in December 2007. We employ the probit model to study how changes in income influence the likelihood of making non-zero expenditures on entertainment activities. Recognizing the presence of a high degree of censoring, we also employ the Tobit model to assess the income effect on recreational activities to avoid bias in the least squares estimator for the latent coefficients. Income coefficient estimates are significantly positive in all years we consider, confirming that entertainment is a normal good. However, we observe statistically significant decreases in the income coefficient during recession years in all three categories of entertainment activities from the Tobit model, while in two out of the three from the Probit model. That is, the responsiveness of consumption to income changes decreases during recession years, which implies a sluggish adjustment in entertainment expenditures when economic distress is elevated.

Keywords: Consumer Expenditure Survey; Entertainment; Great Recession; Probit; Tobit

JEL Classifications: D12; J01; P46

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1 Introduction

This paper empirically investigates potential effects of economic recessions on US household expenditures for entertainment activities using the Consumer Expenditure Survey (CES) data in 2003, 2006, 2008, and 2010.

Patterns of work and entertainment have changed dramatically during the past decades in the U.S. (Weagley & Huh, 2004a; Bilgic et al., 2008). Recently, the world has witnessed a severe recession triggered by the collapse of the U.S. subprime mortgage market. That is, the Great Recession began in December 2008 and has been the deepest and longest lasting economic recession since the Great Depression in the 1930's.

Few studies on the economic effects of the Great Recession on entertainment expenditures have been conducted. In the present paper, we fill the gap by investigating how economic downturns alter the consumption function for entertainment goods and services using the three categories of entertainment data as defined in the CES data. For this purpose, we identify 2008 and 2010 as recession years, while 2003 and 2006 are considered as economic boom years. We statistically evaluate the possibility of changes in the consumption function for entertainment activities when household income falls during recession years.

We note substantial degree of censoring in the data, which leads us to employ the Tobit model instead of the ordinary least squares (OLS) estimator, which is a biased estimator in the presence of censored observations. Even though the Tobit model is useful to quantify the effects of socio-economic variables on the expenditure for entertainment activities, it does not answer the question of how those variables affect the propensity of paying (or not paying) for entertainment activities. Since substantial portion of households, sometimes even majority households, report zero expenditure, this seems to be a meaningful question, so we also employ the probit model by transforming the expenditure data to a dichotomous variable.

We report statistically significant effects of recessions on entertainment activities. Specifically, we note that the income coefficient tends to decrease significantly during recession years for all three categories of entertainment expenditures when the Tobit model is employed, whereas the coefficient falls for two out of the three entertainment expenditures when the probit model is used. Note that a smaller income coefficient implies slower adjustments of consumption expenditures during recessions.

The rest of the present paper is organized as follows. In Section 2, we provide a literature review. Section 3 describes our data, then reports preliminary test results. In Section 4, we specify the empirical models that are employed in this study. Section 5 provides our main empirical findings. Section 6 concludes.

2 Literature Review

Entertainment can be defined as anything that stimulates, encourages, or otherwise generates a condition of pleasurable diversion at the most fundamental level (Enke, 1968; Vogel, 2001), and it can also be defined through its satisfied effect and happy psychological state (Moore et al., 1995; Vogel, 2001; Parr & Lashua, 2004). Entertainment activities are supposed to provide life satisfaction and improve personal wellbeing (Weagley & Huh, 2004b; van der Meer, 2008). There is a large literature on entertainment-related research (Woodside & Jacobs, 1985; Keown, 1989; Ziff-Levine, 1990; Davis & Mangan, 1992; Dardis et al.; 1994; Harada, 1994; Fish & Waggle, 1996; Hsieh et al., 1997; Cai, 1999; Hong et al., 1999; Gilbert & Terrata, 2001; Sung et al., 2001; Jang et al., 2014; Bernini & Cracolici, 2016).

People are living in an entertainment economy locally, globally, and internationally, which is fast becoming the driving wheel of the new world economy (Wolf, 2003). Since the introduction of computer, digital entertainment games have become one of the most popular leisure activities globally (Boyle et al., 2012). Gerben

(2011) investigated the commercialisation and industrialisation of live entertainment in the nineteenth century, revealing that their emergence triggered a process of incessant creative destruction, development and productivity growth that continue in the entertainment industry.

US households cumulatively spend at least 120 billion hours and more than $200 billion on legal forms of entertainment each year (Vogel, 2001). Total household entertainment spending rose by 58% (on average $784) from 1995 to 2011, which is mostly due to in-home and mobile electronic entertainment, not from location-based entertainment and sporting event venues (White, 2012).

When the economy expands or contracts, households re-allocate their budget across various categories of expenditures, which shows expenditure shares decrease for positional goods/services and increase for non-positional goods/services during recessions (Kamakura & Du, 2012). But consumers only marginally respond to a change in income in their consumption patterns after the 2008 recession and Permanent Income Hypothesis holds true (Saisekar, 2012). Campos-Soria et al. (2015) explored how tourists cut back their tourism expenditures in European countries during the 2008 global economic crisis, which also affected the tourism in Canada and the United States (Ritchie, et al. 2010). The 2008 economic recession had dramatic effects on spending on gambling and interrupted growth trends in casino industries in America and Europe, which undermined future growth expectations and potential (Eadington, 2011).

Others studied recession effects on entertainment activities. For example, Wagner & Donohue (1976) investigated the impact of inflation and recession on urban entertainment in New Orleans. Roberts (2015) found wider economic class inequalities have led to wider social class differences in entertainment during recent recessions in Britain. Alegre et al. (2013) examined household tourism participation decisions and tourism expenditure across the business cycle using a Heckman model. Koh et al. (2013)

report that fast-food restaurants showed significantly greater accounting performances than those of non-fast-food restaurants during recessions.

There is a large literature that has examined consumer's decision-making processes for entertainment activities. For example, Sung et al. (2001), Hong et al. (2005), and Zheng & Zhang (2011) studied the demand for travel activities in the US. Jara-Díaz et al. (2008) used a time allocation model to estimate the value of entertainment activities.

Ateca-Amestoy et al. (2008) and Bilgic et al. (2008) employed ordered probit models to quantitatively evaluate the level of satisfaction from entertainment activities. Coenen & van Eekeren (2003) used the two-staged budgeting model to examine the demand for domestic tourism by Swedish households. Cai (1998) employed a Tobit modelling procedure to study the relationship between vacation food expenditures and household socio-demographic characteristics. Jang et al. (2007) used a double-hurdle approach to study food-away-from-home expenditures of senior households in the United States.

3 Data

All observations are from the Consumer Expenditure Survey (CES) of the Bureau of Labor Statistics. "Household" is used instead of "consumer unit" in the CES. The survey assesses the household-level disposable income by subtracting federal, state, and local taxes of all people in the household from household income. To study the business cycle (booms and recessions) effects on entertainment expenditures, we employ the CES data in 2003, 2006, 2008, and 2010, which covers five quarters (15 months) in each survey year, including about 30,000 to 40,000 households for each survey.

The dependent variable is the household expenditures on entertainment activities, which falls into the following three categories: (1) Fees and Admissions (F&A); (2)

Televisions, Radios and Sound Equipment (TRS); (3) Other Equipment and Services (OES). See Table 1 for detailed explanations.

Table 1 about here

We notice that the level of entertainment expenditures has declined substantially in 2010 in both real and nominal terms. As can be seen in Table 2, we observed overall increases in expenditures in 2008 from 2006 both in real and nominal terms except F&A in real term. Furthermore, the median nominal household income decreased from 2008 to 2010 but not in 2008 from 2006, while decreases in the real income were observed in both years.

Table 2 about here

As we can see in Figure 1, GDP per capita has grown in 2008 and in 2010, while the median household income growth rate has slowed down in 2008 and became negative in 2009 and 2010. So it is not quite clear if the Great Recession (based on GDP growth rate) in 2008 is consistent with the dynamics of the US household income. This concern led us to use 2010 in addition to 2008 as recession years relative to 2003 and 2006 as boom years.

Figure 1 about here

We report preliminary statistics of entertainment expenditures of sampled households in 2003, 2006, 2008, and 2010 in Tables 3. Overall, TRS expenditures account for about 40% of the total entertainment expenditures. A little smaller proportion of expenditures is spent for OES. F&A accounts for about 25% of the total entertainment expenditures. Families with children account approximately for 30% of the total

households. The "White" population accounts for about 80% of the total population. More than 90% of the total population reside in urban areas. The majority of households are married and have received a college education.

Table 3 about here

4 The Econometric Model

To address the issue of censored observations, we first report nonparametric kernel density function estimates in addition to a normal density function for comparisons.

As can be seen in Figure 2, we note high degree of censored observations. Roughly over 50% of households spend no money for F&A activities. As to TRS, 18.26%, 16.14%, 15%, and 16.59% of households report zero expenditures in 2003, 2006, 2008, and 2010, respectively. About 45% of households don't spend any money for OES activities. Note that the CES observations are based on 5 *quarterly* expenditure surveys. That is, high frequency of zero-values seems to reflect households' rational decisions rather than being caused by short sample period.

Reflecting this, estimated nonparametric kernel densities contrast greatly from estimated distribution with a normal density assumption. This confirms the existence of censored observations.

It is well-known that the ordinary least squares (OLS) coefficient estimator is severely biased in the presence of censored observations. To correct the bias, we employ the Tobit model. In what follows, however, we first present results from the probit model to understand how much each variable affects the propensity or likelihood of spending non-zero expenditures on entertainment activities. This is an important exercise because substantial portions of households, sometimes majority households, report zero expenditure for these recreational activities.

Figure 2 about here

4.1 Probit Model

Let $u_{1,i}$ denotes the level of utility of an agent i from spending a strictly positive amount of money on recreational activities, while $u_{0,i}$ is the level of utility when the agent does not consume any entertainment services. Employing the random utility model framework, we describe consumers' decision making processes as follows.

$$y_i^* = u_{1,i} - u_{0,i} = x_i'\beta + \varepsilon_i, \quad (1)$$

where x_i is a $k \times 1$ vector of characteristic variables of household i including an intercept, β is its associated vector of coefficients, and ε_i is assumed to be normally distributed. Note that (1) is not directly observable to researchers. That is, it is a latent equation.[1]

Specifically, our model can be described as follows,

$$y_i^* = \alpha_1 + \alpha_2 * D(recession) + \beta_1 * Income + \beta_{11} * \big(Income * D(recssion)\big) + \beta_2 * No.Old + \beta_3 * No.Children + \beta_4 * Age + \beta_5 * FamilySize + \beta_6 * FamilywithChildren + \beta_7 * Male + \beta_8 * Married + \beta_9 * White + \beta_{10} * College + \beta_{11} * Urban + \varepsilon_i$$

Entertainment expenditures and income variables were log-transformed prior to estimations. $D(recession)$ is a recession dummy, that is, $D(recession) = 1$ for the recession years (2008 and 2010), while $D(recession) = 0$ for boom years (2003 and 2006).

[1] One referee concerns about the existence of an issue of multicollinearity. Severe multicollinearity may cause inefficient estimates and/or unstable coefficient estimates. In what follows, our key model estimates are overall statistically significant. Further, as can be seen in our previous manuscript Gao et al. (2015), which is based on separate estimations for 4 different years, coefficient estimates for most characteristic variables (other than the income) seem stable over time. So, we believe our models do not suffer from a severe multicollinearity problem.

Note that the income coefficient is $\beta_1 + \beta_{11}$ during recession years, while it is β_1 in booms. That is, β_{11} measures the change in the responsiveness of entertainment expenditures to changes in the household income during recession years. Finding a statistically significantly negative estimate for β_{11} implies that sluggish adjustment in entertainment activities when economic distress is elevated.

Realized or observed outcome (y_i) in this model is the following.

$$y_i = \begin{cases} 1, & if \quad y_i^* > 0 \\ 0, & \text{Otherwise} \end{cases} \tag{2}$$

We estimate the coefficients in the latent equation (1) by the maximum likelihood estimator for the probit model in what follows.[2] We also report the marginal effect that measures the effect of changes in x_i on the change in the probability of $y_i = 1$.[3]

4.2 Tobit Model

We also employ the Tobit model to investigate the quantitative effects of changes in the characteristic variables on the amount of expenditures on recreational activities. We revise the previous model in (1) and (2) as follows.

$$y_i = \begin{cases} y_i^*, & if \quad y_i^* > 0 \\ 0, & \text{Otherwise} \end{cases} \tag{3}$$

Note that we observe actual expenditures on entertainment activities only when $u_{1,i} > u_{0,i}$, which truncates the distribution of y_i^* at 0. It is well known that the ordinary least squares (OLS) estimator is biased under this situation. Putting it differently, in the

[2] The probability of each event is, $Pr(y_i = 1) = Pr(y_i^* > 0) = \Phi(X_i^T\beta) = \Phi(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik})$ and $Pr(y_i = 0) = Pr(y_i^* \leq 0) = 1 - \Phi(X_i^T\beta) = 1 - \Phi(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik})$, where $\Phi(\cdot)$ is the Gaussian cumulative distribution function.

[3] Marginal effect of x_j is $\Phi(X_i^T\beta)\frac{\partial X_i^T\beta}{\partial x_{ij}} = \Phi(X_i^T\beta)\beta_j$. Since the marginal effect changes depending on the location of i, we report average marginal effects.

presence of substantial degree of censoring, the OLS coefficient estimator *underestimates* the true coefficients, whereas the OLS intercept estimator *overestimates* the true parameter.

In what follows, we estimate and report the coefficient in the latent equation for our probit and the Tobit model via the maximum likelihood estimator (MLE).

5 Empirical findings

We first report the probit model estimation results for the latent equation of non-zero expenditures on entertainment, and marginal effects of explanatory variables on the probability, which measures changes in the probability due to one unit changes in the explanatory variables in the latent equation. Then, we provide Tobit analysis from our censored regression analysis.[4]

In 5 out of 6 cases, we obtained higher intercept estimates during recession years, negative coefficients on the recession dummy, which seem to be at odds with our prior belief on recession effects. However, it turns out that the income coefficient becomes significantly smaller during recession years in most cases. These two effects jointly imply a sluggish adjustment when negative income shocks occur in recessions.[5]

5.1 Probit model

As we can see in Table 4 for F&A expenditures, we observe statistically significant decreases in the intercept estimates in the recession years (2008 and 2010) compared with

[4] See Gao et al. (2015) for the OLS estimates.

[5] One alternative explanation about the decrease in the intercept is that consumers increased their spending on entertainment-related equipment such as iPods and iPads which became very popular since the mid-2000s. Because our models do not include proxy variables for such technological innovations, those potentially positive effects on expenditures might have been included in the intercept, dominating negative effects from recessions.

those in the boom years (2003 and 2006), since the recession dummy is negative. That is, $\alpha_1 + \alpha_2 = -2.7620 - 0.1704 = -2.9324$ in recessions, whereas it is $\alpha_1 = -2.7620$ in booms. Further, the income coefficient increases slightly ($\beta_{11} > 0$), although it is marginally significant only at the 10% level.

However, we find statistically significant increases in the intercept and significant decreases in the income coefficient estimates for TRS and OES expenditures during recession years, which jointly implies a sluggish adjustment of entertainment expenditures when economic distress gets elevated. See Tables 5 and 6. The next section reports similar findings for all three type expenditures when the Tobit model is employed.[6] This explains why entertainment expenditures did not decrease much when the economy went into downturns during the Great Recession.

For all three-type expenditures including F&A, "Income" has a statistically significant positive effect, which implies that entertainment is a normal good/service. As we can see in Table 4, "Family with children" and "Married" have all positive and statistically significant coefficients, which seems reasonable because F&A includes membership fees and admissions for entertainment activities. "White", "Male", "College", and "Urban" all have significantly positive coefficients, which might be the case as those characteristic variables are highly correlated with "Income". "Age" and "Family size" have negative coefficients, which makes sense because travel becomes more difficult for a big family or ones with older people aging. Other variables overall have correct signs based on conventional wisdom but are not always statistically significant.

[6] Some measures of the goodness of fit such as McFadden Pseudo R^2 and Veall-Zimmermann Pseudo R^2 are available upon request, which range from 0.10 to 0.25. It should be noted that we use parsimonious models to focus on the income effect during recession years, so the goodness of fit is not our major concern. That is, we are primarily interested in statistically meaningful changes of the income effect.

Marginal effects are consistent with the probit coefficient estimates. With one unit increase in income, the probability of spending on F&A goes up by about 7.28% in boom years and 7.64% in recession years. Households with an additional family member exhibited a decrease in the probability of making strictly positive expenditure by about 0.81%. Households with one more child increased the probability by about 5.08%. On the contrary, a decrease in the family size results in an increase in the probability of spending on F&A by about 0.81%. Family with children, being married (Married), white people (White), and people with a college education (College), being male (Male), or being urban (Urban) all increase the probability of spending on F&A. For example, "Male" has the probability about 2.14% higher than female in both boom and recession years.

Table 4 about here

For the TRS category (Table 5), "Income" has a significantly positive effect and its marginal effect of income is also consistent with the latent equation estimate. "Family size", "Family with children" and "Married" have statistically significantly positive coefficients. Since this category includes TVs, radios, and other sound equipment, it seems reasonable to see these family-related characteristic variables. "Number of adults older than the age of 64", "Number of children", and "Male" have significantly negative coefficients. Other variables such as "Urban" and "Age" do not have significant consistent estimates.

Marginal effects are again consistent with the probit coefficient estimates. With one unit increase in income, the probability of spending on TRS goes up by about 4.46% in the boom years and 3.94 in the recession years. But household with one more adult older than the age of 64 decreased the probability by about 0.44%. "Male" exhibited a lower probability about 0.93%, compared with Female for expenditures spending on TRS.

Higher educated household shows a higher probability (approximately 6.62%) than lower educated household.

Family with children, being married (Married), white (White), and people with a college education (College), or being male (Male) increase the probability of spending on TRS, but quantitatively differently. Having additional adult older than 64 or having one more child decreases the probability of expenditure on TRS about 0.44% and 2.24, respectively.

Table 5 about here

For the OES category (Table 6), "Income" again has a significantly positive coefficient. "White" and "College", which are correlated with "Income", also exhibited statistically significant positive coefficients. Family related variables such as "Married", "Family size", and "Family with children" also have positive coefficients that are highly significant. This make sense because OES includes household expenditures for family oriented activities that involve playground equipment, hunting, fishing, and camping.

We note that "Number of elderly" and "Age" exhibit highly significant but negative effects for the OES category, which might be the case that people may start reducing their expenditures on those family-oriented activities as they grow older. "Urban" also has negative coefficients, which may happen if recreational activities such as hunting and fishing cost more to urban residents than to rural area residents.

Marginal effects are again in line with the probit coefficient estimates. An increase in income raises the probability by about 5.66% and 5.21% for the boom and recession years, respectively. One additional family member significantly increases the probability about 2.01%. The marginal effect of the OES category is negative for the Number of adults older than 64, Age, Male, and Urban, and but positive for others. For example, White

people have a higher probability about 18.28% than non-White people. Urban residents show a lower probability about 5.14% than rural residents.

Table 6 about here

5.2 Tobit model

We report our Tobit model estimates for each of the three recreational activity categories, F&A, TRS, and OES, in Tables 7, 8, and 9, respectively. We note that all OLS intercept estimates (not reported) are greater than those from the Tobit estimations, reflecting that observations are censored at 0 as can be seen in Figure 2. Also, OLS coefficient estimates are smaller than those of the Tobit MLE, which again confirms the (downward) bias of the OLS estimator in the presence of censored observations.[7]

Income coefficient estimates are statistically significantly positive in all expenditure categories. Putting it differently, F&A, TRS, and OES all exhibit a property of normal goods. Unlike the probit model estimations, we observe statistically significant decreases in the income coefficient estimates for all three types during recessions in comparison with the boom years for all three categories of entertainment expenditures. For F&A (Table 7), the income point estimate is 0.2701 in the boom years, while it is 0.2453 in the recession years. The coefficient estimate was 0.1536 in the boom years, while it was 0.1427 for TRS expenditures. For OES expenditures, it decreases from 0.2335 to 0.1939 during recession years. These estimates are highly significant at least at the 5% level. That is, we observe statistically significant decreases in all three-type expenditures during

[7] We do not report biased OLS estimates to save space. For OLS results, see Gao et al. (2015).

recession years, which imply a slow adjustment of entertainment consumption when economic distress becomes elevated during economic downturns.

For the F&A expenditures (Table 7), we obtain statistically significant and positive estimates for "Numbers of Children", "Family with children" and "Married" in all years, which seems reasonable because F&A includes membership fees and admissions for entertainment activities. "White", "Male", "College", and "Urban" also have significantly positive coefficients. This makes senses because those characteristic variables are highly correlated with "Income". Most other coefficients have correct signs based on conventional wisdom and mostly are statistically significant with few exceptions.

Table 7 about here

For the TRS category (Table 8), "Number of Adults over 64" and "White" have statistically significant negative effects. "Family size", "Family with children" and "Married" have statistically significantly positive coefficients in all cases with a few exceptions. Since this category includes TVs, radios, and other sound equipment, it seems reasonable to see these family-related characteristic variables have positive coefficients. As in the case for F&A, income-related variables such as "Male", "College", and "Urban" have highly significant positive coefficients in most cases. "Number of children" has significantly negative coefficients in all cases, which seems at odds with coefficient estimates for "Family with children" that are all significantly positive.

Table 8 about here

For the OES category expenditures (Table 9), "Urban", "White", and "College", which are correlated with "Income", also exhibited statistically significant positive coefficients. Family related variables such as "Married", "Number of Children", and

"Family size" also have positive coefficients that are highly significant. This makes sense because OES includes household expenditures for family oriented activities that involve playground equipment, hunting, fishing, and camping. We note that "Number of elderly" exhibits highly significant but negative effects from all Tobit estimates, which might be the case that people may start reducing their expenditures on those family-oriented activities as they grow older. "Family with children" also has a negative coefficient, which may reflect the fact that recreational activities such as hunting and fishing cost more to household with children than to household without children.

Table 9 about here

6 Conclusions

This paper examined potential effects of the Great Recession on household consumption for entertainment activities in the U.S. using the CES data in 2003, 2006, 2008, and 2010. We attempt to understand household responses to economic distress by estimating consumption functions in recession years (2008 and 2010), in comparison with boom years (2003 and 2006) as the benchmark.

Facing substantial degree of censoring in the data, we employ the probit model to understand the role of changes in the household income on the likelihood of making non-zero expenditure on entertainment activity, controlling the effects of other socio-economic variables. Further, we implemented the Tobit analysis to quantify the effect of changes in the income, correcting for the bias in the OLS estimator in the presence of censored observations, on the amount of entertainment expenditures during recession years in comparison with the expenditures during economic booms.

Income has significantly positive coefficients for all three types of entertainment activities across all years. However, the role of income on entertainment activities is not

independent from business cycle, since we found empirical evidence that recessions tend to weaken the income effect. Recessionary effects were observed from decreases in the income coefficient during recession years for all three categories of expenditures from the Tobit model and for two out of the three from the probit model estimations. It should be noted that a decrease in the income coefficient during recessions implies a slow adjustment of consumption expenditures on entertainment when the income growth slows down. This may help explain seemingly puzzling observations that entertainment spending often does not decrease much during economic recessions. See Paulin (2012) for similar observation for travel expenditure.

Economic downturns tend to generate financial distress, which will negatively affect consumers' welfare (Kamakura & Du, 2012). Crouch et al. (2007) reveals how individuals and households make trade-offs when allocating their spending among various potential categories of discretionary expenditures for tourism. Rational consumers will re-allocate available resources to entertainment activities to improve their well-being and better physical and mental health, which may require public health intervention and policy to increase opportunities for young people to engage in regular habitual entertainment activities (Griffiths, et al., 2010).[8]

Roger & Zaragoza-Lao (2003) mentioned that communities that offer entertainment services are more likely to have healthier children. The computer-mediated games in general that can support entertainment and socialization aids to promote positive mental and social health of the elderly (Theng, et al., 2012). Our results are consistent with this view and provide potentially useful policy implications.

[8] One referee suggests implementing a similar analysis for consumption of non-entertainment goods or services to rigorously show if such re-allocation occurs during recession years. We agree with this suggestion but we leave it to a future study because the topic is beyond the scope of this manuscript.

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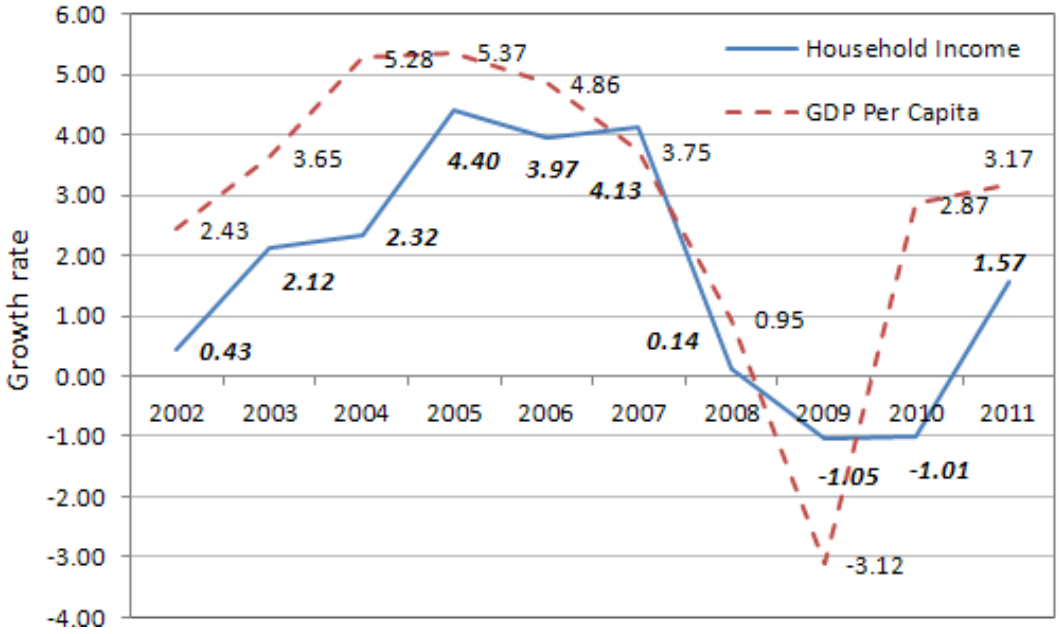
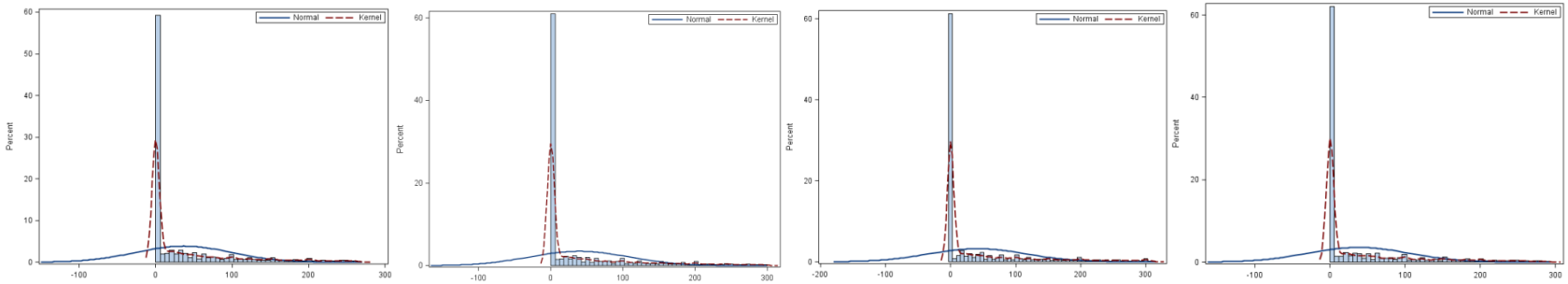
Figure 1: US Income Growth Rates



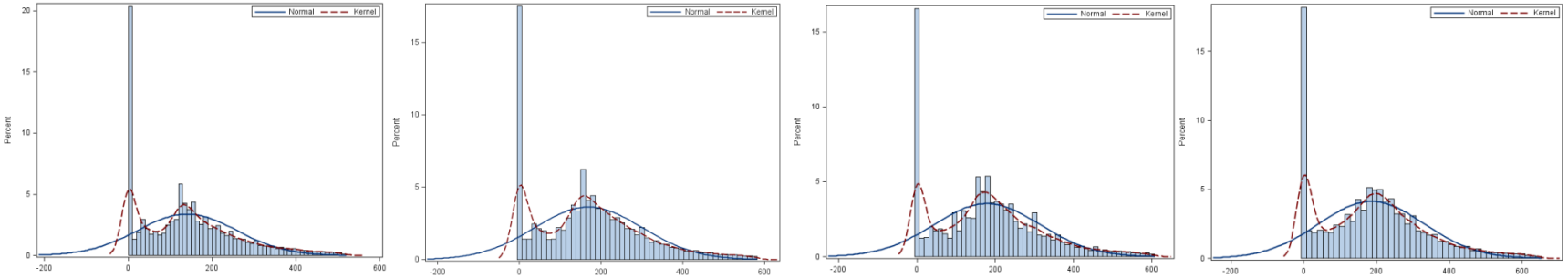
Note: Median household income data is from the US Census Bureau. The GDP per capita data is obtained from the Federal Reserve Economic Data (FRED).

Figure 2. Kernel Densities of Expenditures in 2003 (left), 2006 (left-middle), 2008 (right-middle), and 2010(right)

(a) Fees and Admissions



(b) Televisions, Radios, and Sound Equipment



(c) Other Equipment and Services

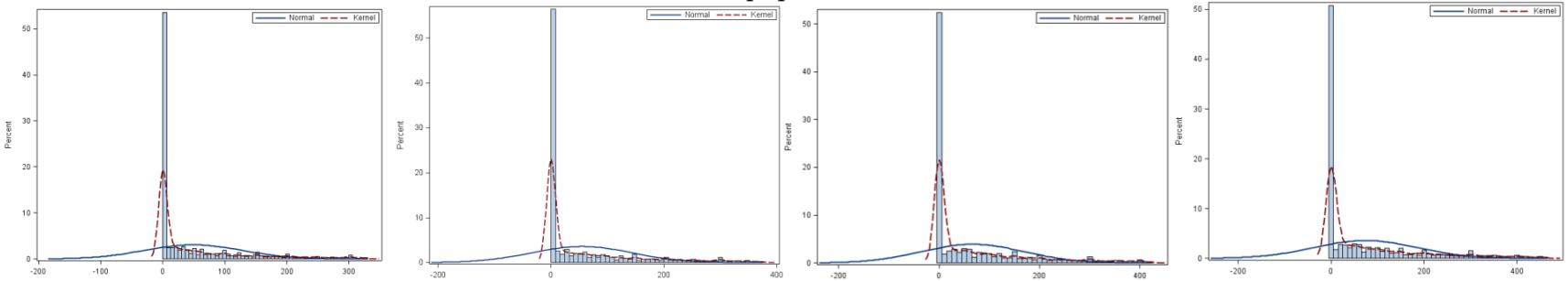


Table 1. Definition of Entertainment Expenditures

Entertainment
Fees and admissions
Miscellaneous recreational expenses on out-of-town trips
Membership fees for clubs, swimming pools, social or other recreational organizations, service
Fees for participant sports, participant sports on out-of-town trips, recreational lessons or other instructions
Management fees for recreational facilities
Admission fees for entertainment activities, sporting events on out-of-town trips
Entertainment expenses on out-of-town trips
Admission fees to sporting events (single admissions and season tickets)
Miscellaneous entertainment services on out-of-town trips
Televisions, radios, and sound equipment
Cable, satellite, or community antenna service, satellite radio service, satellite dishes
Televisions, video cassettes, tapes, and discs, video and computer game hardware and software
Streaming or downloaded video files, radio, tape recorder and player, digital audio players
Sound components, component systems, and compact disc sound systems
Accessories and other sound equipment including phonographs
Records, CDs, audio tapes, streaming or downloaded audio files
Repair of television, radio, and sound equipment, excluding installed in vehicles
Rental of televisions, VCR, radio, and sound equipment
Musical instruments, supplies, and accessories
Rental and repair of musical instruments, supplies, and accessories
Installation for TVs, satellite TV equipment, sound systems, other video or sound systems
Other equipment and services
Toys, games, arts, crafts, tricycles, and battery powered riders, playground equipment
Pets, pet supplies and medicine for pets, pet services, veterinarian expenses for pets
Docking and landing fees for boats and planes
Rental of non-camper-type trailer, boat or non-camper-type trailer
Outboard motor, boat without motor or non-camper-type trailer, boat with motor (net outlay), bicycles
Trailer-type or other attachable-type camper (net outlay)
Purchase of motor home, other vehicle
Ping-Pong, pool tables, other similar recreation room items
Hunting and fishing, winter/water/other sports, health and exercise equipment
Photographic film, film processing, photographic equipment, professional photography fees
Rental and repair of photographic equipment, sports, and recreation equipment
Rental of all boats and outboard motors, motor home, other RV's
Rental of all campers, other vehicles on out-of-town trips
Online entertainment and games, live entertainment for catered affairs

Source: Consumer Expenditure Survey.

Table 2. Entertainment Expenditures and Household Income

	Nominal				*Real*			
	2003	2006	2008	2010	2003	2006	2008	2010
F&A	130	156	161	148	130	142	137	125
TRS	191	235	256	240	191	214	218	203
OES	183	190	225	193	183	173	193	163
Income	41,694	48,261	49,737	49,485	41,694	44,007	42,515	41,751

Note: Median income data is from the US Census Bureau. Real variables are obtained by deflating nominal variables by the 2011 CPI-U.

Table 3. Summary of the variables in 2003, 2006, 2008, and 2010

Variable	2003 (N=40374)	2006 (N=35832)	2008 (N=34485)	2010 (N=35298)
	Mean (Std Dev)	Mean (Std Dev)	Mean (Std Dev)	Mean (Std Dev)
Total expenditure ($)	503.12 (1656.64)	580.36(1563.03)	641.52 (1429.30)	580.58 (1518.27)
F&A	129.75 (429.76)	234.85 (475.56)	160.57 (498.72)	147.78 (571.05)
TRS	190.82 (383.59)	189.82 (392.30)	255.54 (415.48)	240.08 (323.20)
OES	182.54 (1496.61)	182.54 (1357.15)	225.41 (1184.24)	192.72 (1289.13)
Income after tax ($)	41694.00 (47255.95)	48260.95 (55544.85)	49736.83 (58141.69)	49484.55 (59900.82)
Family size	2.53 (1.50)	2.55 (1.51)	2.52 (1.49)	2.51(1.53)
No. of adult>64 years old	0.31 (0.61)	0.31 (0.61)	0.33 (0.63)	0.33(0.62)
No. of children	0.68 (1.09)	0.67 (1.08)	0.65 (1.08)	0.63 (1.07)
Age	48.48 (17.55)	49.03 (17.27)	49.63 (17.33)	49.64 (17.38)
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Family type				
Family with child	12828 (31.77)	11412 (31.85)	10699 (31.03)	10338 (29.29)
Family without child	27546 (68.23)	24420 (68.15)	23786 (68.97)	24960 (70.71)
Marital status				
Married	21285 (52.72)	19165 (53.49)	18414 (53.40)	18013 (51.03)
Not-married	19089 (47.28)	16667 (46.51)	16071 (46.60)	17285 (48.97)
Gender				
Male	20317 (50.32)	16627 (46.40)	161519 (46.83)	16543 (46.87)
Female	20057 (49.68)	19205 (53.60)	18334 (53.17)	18755 (53.13)
Race				
White	33431 (82.80)	29433 (82.14)	28199 (81.77)	28390 (80.43)
Not-White	6943 (17.20)	6399 (17.86)	6286 (18.23)	6908 (19.57)
Education				
Attend college	23272 (57.64)	21086 (58.85)	208499 (60.46)	21352 (60.49)
Never attend college	17102 (42.36)	14746 (41.15)	13636 (39.54)	13946 (39.51)
Location				
Urban	36616 (90.69)	33774 (94.26)	32515 (94.29)	33395 (94.61)
Rural	3758 (9.31)	2058 (5.74)	1970 (5.71)	1903 (5.39)
Season				
1st quarter	8086 (20.03)	7786 (21.73)	6914 (20.05)	7198 (20.39)
2nd quarter	8196 (20.30)	7009 (19.56)	6942 (20.13)	7135 (20.21)
3rd quarter	8072 (19.99)	6988 (19.50)	6794 (19.70)	7059 (20.00)
4th quarter	8044 (19.92)	7084 (19.77)	6895 (19.99)	7037 (19.94)
5th quarter	7976 (19.76)	6965 (19.44)	6940 (20.12)	6869 (19.46)

Note: Standard deviation and percentage of frequency are in parenthesis.

Table 4. Probit Model Estimations: Fees and Admissions

Variable	Estimate	Standard Error	Marginal Effect	Std. Dev.
Recession	-0.1704***	0.0640	-0.0590	0.0097
Income	0.2101***	0.0046	0.0728	0.0119
Income*Recession	0.0104*	0.0061	0.0036	0.0006
No. of adults>64 years old	-0.0025	0.0084	-0.0009	0.0001
No. of children	0.0070	0.0072	0.0024	0.0004
Age	-0.0082***	0.0003	-0.0028	0.0005
Family size	-0.0234***	0.0052	-0.0081	0.0013
Family with children	0.1468***	0.0108	0.0508	0.0083
Male	0.0617***	0.0075	0.0214	0.0035
Married	0.1031***	0.0097	0.0357	0.0058
White	0.3460***	0.0100	0.1199	0.0196
College	0.6198***	0.0078	0.2147	0.0352
Urban	0.2489***	0.0150	0.0862	0.0141
1st quarter	0.0594***	0.0116	0.0206	0.0034
2ed quarter	-0.0032	0.0117	-0.0011	0.0002
3rd quarter	0.0680***	0.0117	0.0236	0.0039
4th quarter	0.0432***	0.0117	0.0150	0.0024
Intercept	-2.7620***	0.0502	-	-

Note: Std. Dev. means standard deviation. *** P<0.01, **P<0.05, *P<0.10.

Table 5. Probit Model Estimations: Televisions, Radios, and Sound Equipment

Variable	Estimate	Standard Error	Marginal Effect	Std. Dev.
Recession	0.2961***	0.0655	0.0653	0.0252
Income	0.2025***	0.0047	0.0446	0.0172
Income*Recession	-0.0237***	0.0065	-0.0052	0.0020
No. of adults>64 years old	-0.0200**	0.0101	-0.0044	0.0017
No. of children	-0.1017***	0.0090	-0.0224	0.0086
Age	0.00004	0.0003	0.00001	0.000004
Family size	0.0783***	0.0065	0.0173	0.0067
Family with children	0.1053***	0.0138	0.0232	0.0090
Male	-0.0420***	0.0091	-0.0093	0.0036
Married	0.1904***	0.0118	0.0420	0.0162
White	0.2035***	0.0110	0.0449	0.0173
College	0.3002***	0.0092	0.0662	0.0255
Urban	0.0251	0.0172	0.0055	0.0021
1st quarter	0.00003	0.0141	0.000007	0.000003
2ed quarter	-0.0492***	0.0140	-0.0108	0.0042
3rd quarter	-0.0794***	0.0140	-0.0175	0.0067
4th quarter	-0.0544***	0.0140	-0.0120	0.0046
Intercept	-1.5936***	0.0529	-	-

Note: Std. Dev. means standard deviation. *** P<0.01, **P<0.05, *P<0.10.

Table 6. Probit Model Estimations: Other Equipment and Services

Variable	Estimate	Standard Error	Marginal Effect	Std. Dev.
Recession	0.1913***	0.0615	0.0674	0.0098
Income	0.1607***	0.0044	0.0566	0.0082
Income*Recession	-0.0128**	0.0059	-0.0045	0.0007
No. of adults>64 years old	-0.1063***	0.0082	-0.0375	0.0054
No. of children	-0.0011	0.0072	-0.0004	0.0001
Age	-0.0049***	0.0003	-0.0017	0.0003
Family size	0.0570***	0.0052	0.0201	0.0029
Family with children	0.1267***	0.0109	0.0446	0.0065
Male	-0.1259***	0.0075	-0.0443	0.0064
Married	0.2626***	0.0096	0.0925	0.0134
White	0.5191***	0.0098	0.1828	0.0266
College	0.2956***	0.0078	0.1041	0.0151
Urban	-0.1459***	0.0148	-0.0514	0.0075
1st quarter	0.0415***	0.0116	0.0146	0.0021
2ed quarter	-0.1859***	0.0116	-0.0655	0.0095
3rd quarter	-0.1524***	0.0117	-0.0537	0.0078
4th quarter	-0.1752***	0.0116	-0.0617	0.0090
Intercept	-1.9086***	0.0488	-	-

Note: Std. Dev. means standard deviation. *** P<0.01, **P<0.05, *P<0.10.

Table 7. Tobit Model Estimations: Fees and Admissions

Variable	Estimate	Standard Error	t Value	Approx. Pr > |t|
Recession	0.3418***	0.0913	3.74	0.0002
Income	0.2701***	0.0063	42.8	<.0001
Income*Recession	-0.0248***	0.0085	-2.92	0.0035
No. of adults>64 years old	-0.0178	0.0121	-1.47	0.1416
No. of children	0.0992***	0.0098	10.16	<.0001
Age	0.0071***	0.0004	16.69	<.0001
Family size	-0.0080	0.0074	-1.08	0.2823
Family with children	0.0947***	0.0147	6.44	<.0001
Male	0.0805***	0.0102	7.89	<.0001
Married	0.2436***	0.0137	17.83	<.0001
White	0.1989***	0.0149	13.34	<.0001
College	0.4354***	0.0117	37.13	<.0001
Urban	0.4078***	0.0229	17.79	<.0001
1st quarter	-0.0137	0.0158	-0.87	0.3850
2ed quarter	0.0502***	0.0161	3.12	0.0018
3rd quarter	0.1357***	0.0159	8.53	<.0001
4th quarter	0.0671***	0.0160	4.21	<.0001
Sigma	1.2620***	0.0035	356.57	<.0001
Intercept	0.3756***	0.0708	5.3	<.0001

Note: *** P<0.01, **P<0.05, *P<0.10.

Table 8. Tobit Model Estimations: Televisions, Radios, and Sound Equipment

Variable	Estimate	Standard Error	t Value	Approx. Pr > |t|
Recession	0.2767***	0.0458	6.04	<.0001
Income	0.1536***	0.0033	46.87	<.0001
Income*Recession	-0.0109**	0.0044	-2.51	0.0122
No. of adults>64 years old	-0.0815***	0.0060	-13.51	<.0001
No. of children	-0.0583***	0.0052	-11.27	<.0001
Age	0.0049***	0.0002	21.99	<.0001
Family size	0.0797***	0.0038	20.96	<.0001
Family with children	0.0713***	0.0078	9.16	<.0001
Male	0.0224***	0.0055	4.1	<.0001
Married	0.0921***	0.0070	13.08	<.0001
White	-0.0176**	0.0073	-2.41	0.0159
College	0.0839***	0.0058	14.57	<.0001
Urban	0.0962***	0.0108	8.89	<.0001
1st quarter	-0.0260***	0.0084	-3.11	0.0019
2ed quarter	-0.1689***	0.0084	-20.03	<.0001
3rd quarter	-0.1482***	0.0085	-17.48	<.0001
4th quarter	-0.1328***	0.0085	-15.7	<.0001
Sigma	0.8790***	0.0019	466.8	<.0001
Intercept	3.0300***	0.0365	83.04	<.0001

Note: *** P<0.01, **P<0.05, *P<0.10.

Table 9. Tobit Model Estimations: Other Equipment and Services

Variable	Estimate	Standard Error	t Value	Approx. Pr > |t|
Recession	0.6080***	0.0884	6.87	<.0001
Income	0.2335***	0.0063	37.12	<.0001
Income*Recession	-0.0396***	0.0083	-4.79	<.0001
No. of adults>64 years old	-0.1291***	0.0112	-11.55	<.0001
No. of children	0.0175*	0.0091	1.93	0.0542
Age	0.0005	0.0004	1.24	0.2139
Family size	0.0413***	0.0069	6.03	<.0001
Family with children	-0.0004	0.0134	-0.03	0.9755
Male	0.0088	0.0098	0.9	0.3683
Married	0.2056***	0.0127	16.16	<.0001
White	0.3182***	0.0149	21.41	<.0001
College	0.1981***	0.0105	18.8	<.0001
Urban	0.0475**	0.0187	2.54	0.011
1st quarter	-0.0061	0.0145	-0.42	0.6762
2ed quarter	-0.3108***	0.0152	-20.49	<.0001
3rd quarter	-0.2443***	0.0151	-16.15	<.0001
4th quarter	-0.2596***	0.0152	-17.09	<.0001
Sigma	1.2737***	0.0034	376.86	<.0001
Intercept	1.7921***	0.0692	25.88	<.0001

Note: *** P<0.01, **P<0.05, *P<0.10.