Auburn University
Department of Economics
Working Paper Series

On the Effect of the Great Recession on US Household Expenditures for Entertainment

Liping Gao, Hyeongwoo Kim, and Yaoqi Zhang

AUWP 2015-06

On the Effect of the Great Recession on US Household Expenditures for Entertainment*

Liping Gao, Hyeongwoo Kim, and Yaoqi Zhang

May 2015

Abstract

This paper empirically investigates potential effects of economic recessions on consumers' decision-making process for leisure activities using the Consumer Expenditure Survey (CES) data during the Great Recession. Recognizing the presence of a high degree of censoring, we employ the Tobit model to assess the income effect on recreational activities in order 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 leisure is a normal good. However, we observe statistically significant decreases in the income coefficient during recession years in two out of three categories of leisure activities. That is, the responsiveness of consumption to income changes decreases during recession years, which implies a sluggish adjustment in leisure expenditures when economic distress is elevated.

Keywords: Entertainment; Leisure Consumption; Consumer Expenditure Survey; Tobit Model

JEL Classifications: D12; J01; P46

* **Liping Gao** is a postdoctoral scholar in the Department of Biological Sciences at the University of Texas at El Paso. **Hyeongwoo Kim** is Associate Professor of Economics at Auburn University. **Yaoqi Zhang** is Professor in the School of Forestry & Wildlife Sciences at Auburn University. We thank Madeline Kim for excellent research assistance. Corresponding author is Hyeongwoo Kim and contact information is the following. Department of Economics, Auburn University, AL 36849, USA. Tel: 1-334-844-2928. Fax: 1-334-844-4615. Email: gmmkim@gmail.com.

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.

US households cumulatively spend at least 120 billion hours and more than $200 billion on legal forms of entertainment each year. 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).

Entertainment can be defined as anything that stimulates, encourages, or otherwise generates a condition of pleasurable diversion at the most fundamental level (Vogel, 2015). It can also be defined through its satisfied effect and happy psychological state (Moore et al., 1995; Vogel, 2015; Parr and Lashua, 2004). Leisure activities are supposed to provide life satisfaction and improve personal wellbeing (Weagley and Huh, 2004b; van der Meer, 2008). Dardis et al. (1994) pointed out that economic and social environment changes have influenced leisure activities and expenditures in the US.

There is a large literature that has examined consumer's decision-making processes for entertainment and leisure activities. For example, Sung et al. (2001), Hong et al. (2005), and Zheng and Zhang (2011) studied demand for travel activities in the US. Jara-Díaz et al. (2008) used a time allocation model to estimate leisure values. Typically, quantitative evaluations of leisure satisfaction are implemented through ordered Probit models, see for example, Ateca-Amestoy et al. (2008) and Bilgic et al. (2008).

Patterns of work and leisure have changed dramatically during the past decades in the US (Weagley and Huh, 2004a; Bilgic et al., 2008). In the present paper, we investigate the effects of recent economic downturns on the consumption function for entertainment goods and services. For this purpose, we use 2008 and 2010 CES data for recession years, while 2003 and 2006 CES data are considered as economic boom years. Comparing estimated consumption functions across booms and recessions, we attempt to see whether meaningful changes as to the income effect occurred in those years.

We note substantial degree censored observations in all years, which leads us to employ the Tobit model instead of the ordinary least squares (OLS) estimator, because it is a biased estimator in such circumstances. Our empirical findings imply statistically significant effects of recessions on recreational activities via changes in the income coefficient and in the intercept during economic downturns. For example, income coefficients decrease statistically significantly during recession years for two out of the three recreation expenditures categories, implying slower adjustments of consumption expenditures during recessions. We also observed signficant decreases in intercept estimates for Fees and Admissions (F&A) in 2008 and 2010 relative to 2003 and 2006. This may imply exogenous changes (decreases) across those years outside our model specification. We also found non-negligible changes in coefficients of some socio-economic variables including the number of children, family size, and the marital status.

The rest of the paper is organized as follows. Section 2 provides a data description and preliminary test results. In Section 3, we provide our main empirical findings. Section 4 concludes.

Data Description and Preliminary Analysis

We obtained most data from the Consumer Expenditure Survey (CES) from the Bureau of Labor Statistics. "Household" is used instead of "consumer unit" in the CES. In the survey, household disposable income is assessed as the personal income minus all taxes paid by the household.

Entertainment expenditures are classified into the following three: (1) Fees and Admissions (F&A); (2) Televisions, Radios, and Sound Equipment (TRS); and (3) Other Equipment and Services (OES).[1] 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 is about 80% of the total population. More than 90% of the total population in the survey resides in urban areas. The majority of households is married and has received a college education.[2]

We note very high degree censored observations as we can see in Figure 1. 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 $0 in 2003, 2006, 2008, and 2010, respectively. About 45% of households don't spend any money for OES activities.

To highlight this issue, we estimated nonparametric kernel density functions and compared them with a normal density function. Clearly, estimated nonparametric (kernel) densities are quite different from estimated distribution with a normal density assumption. This confirms the existence of censored observation problems, which implies a severe bias in ordinary least squares (OLS) coefficient estimates. To correct the bias, we employ the Tobit model and report coefficient estimates of explanatory variables in comparison with those from the OLS method.

Insert Figure 1 around here

To study the business cycle (booms and recessions) effects on expenditures for recreational activities, we use the CES data in 2003, 2006, 2008, and 2010, which covers five quarters in each survey year. We notice that the level of entertainment expenditures declined substantially in 2010 in both real and nominal terms. As can be seen in Table 1, we observed overall increases in expenditures in 2008 from 2006 both in real and nominal terms except F&A

[1] Detailed explanations of the data are available from authors upon requests.

[2] All summary statistics of relevant data are available from authors upon requests.

in real term. Furthermore, the median nominal household income decreased from 2008 to 2010 but not in 2008 from 2006, while decreases in real income were observed in both years.

As we can see in Figure 2, GDP per capita actually exhibited a positive growth rate in 2008 and in 2010, while median household income growth slowed down in 2008 and became negative in 2009 and 2010. So it is not quite clear whether the Great Recession (based on GDP growth rate) in 2008 is consistent with the dynamics of the US household income. This concern leads us to use 2010 in addition to 2008 as recession years relative to 2003 and 2006 as boom years.

Insert Table 1 and Figure 2 around here

The Econometric Model and Empirical Findings

Censored Observations and the Tobit Model

Let $u_{1,i}$ denotes an unobservable 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 by the following latent equation.

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

where x_i is a $k \times 1$ vector of characteristic variables of i including an intercept, β is its associated vector of coefficients, and ε_i is assumed to be normally distributed. Then, realized outcome (y_i) is the following.

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

Note that we observe actual expenditures on leisure 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 presence of substantial degree of censoring, the OLS tends to underestimate the true coefficients, whereas the OLS intercept estimate tends to overestimate the true parameter.

In what follows, we estimate and report β in the latent equation (1) as well as the intercept by the conventional Tobit model via the maximum likelihood estimator (MLE).

Major Empirical Findings

We report our Tobit model estimates for each of the three recreational activity categories, F&A, TRS, and OES, in Table 2. For comparison, we also report OLS estimates in the same table. We note that all OLS intercept estimates are greater than those from the Tobit estimations, reflecting that observations are censored at 0 as can be seen in Figure 1. 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.

From F&A expenditure function estimates, we observe statistically significant decreases in intercept estimates in the recession years (2008 and 2010) compared with those in the boom years (2003 and 2006). For example, the intercept point estimate in 2003 is -0.793, while it is -1.084 in 2010. These estimates are highly significant. Further, their 95% confidence intervals do not overlap each other.[3] That is, we observe a statistically significant decrease in F&A expenditures during recession years, which were caused by a certain exogenous variables (such as sentiment) that are not included in our estimation models.

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. From TRS and OES expenditure function estimates, we observe statistically significant decreases in the income coefficient estimates in the recession years in comparison with the boom years. For instance, the coefficient estimate was 0.002 in 2003, while it was 0.001 in 2010 for TRS expenditures. For OES expenditures, it decreases from 0.007 to 0.005 during the same period. These estimates are highly significant and again their confidence bands are not overlapping.

Such changes in the income coefficient imply a slow adjustment of consumption expenditures during recessions. This is because when the income decreases during economic downturns, the responsiveness of consumption falls, resulting in a smaller adjustment in leisure consumption. This may explain why leisure expenditures may not decrease substantially when the economy goes into downturns.

One other notable finding is that we obtained higher intercept estimates for TRS and OES categories in 2008 and 2010 (recessions) compared with those in 2003 and 2006 (booms), which seem to be at odds with our prior belief on recession effects. Our conjecture 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 model does 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.

Insert Table 2 around here

Other Findings

For the F&A expenditures, 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 in all years. This makes senses because those characteristic variables are highly correlated with

[3] For 95% confidence bands, we use the 2σ rule with the normal approximation. All standard errors of the coefficient estimates are available upon requests.

"Income". Most other coefficients have correct signs based on conventional wisdom and mostly are statistically significant with few exceptions.

For the TRS category, "Income" has a significantly positive effect in all cases. "Number of Adults over 64" has 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 equipments, 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", "White", "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.[4]

For the OES category expenditures, "Income" again has all significantly positive effects in all cases. "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 in most cases except for biased OLS estimates. 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" and "Age" exhibit highly significant but show negative effects from all Tobit estimates (not biased OLS estimates), 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.

Conclusions

This paper examines potential effects of the Great Recession on household consumption expenditures for entertainment activities in the US using the CES data in 2003, 2006, 2008, and 2010. We estimate reduced-form consumption functions for leisure activities during the recession years, 2008 and 2010, in comparison with those in 2003 and 2006, the benchmark economic boom years.

Facing substantial degree of censoring in the data, we employed the Tobit model to investigate the effect of changes in the household income on the decision-making process for consumption of entertainment activities, controlling other socio-economic variables such as family characteristics and residential environment. Our Tobit estimation results confirm severe bias in the OLS coefficient estimates due to censored data. The bias often is severe enough to distort statistical inferences.

Our empirical findings show that income has significantly positive coefficients for all three types of entertainment activities across all years, confirming that leisure is a normal good. However, the role of income on entertainment activities is not independent from the business cycle, as we found statistically significant effects of recessions.

[4] There may be unobserved nonlinearity in the true data generating process.

Recessionary effects were observed from decreases in the intercept (F&A) and/or from decreases in the income coefficient (TRS and OES) during economic downturns. We note that a decrease in the income coefficient during recessions implies a slow adjustment of consumption expenditures when economic/financial distress is high. This may help explain seemingly puzzling observations that leisure spending often does not decrease much during economic recessions (see Paulin (2012) for similar observation for travel expenditure). Economic downturns tend to generate economic/financial distress, which negatively affects consumers' welfare. Rational consumers may re-allocate available resources to entertainment activities to recover the loss of welfare caused by recessions. Our results may be consistent with this view.

References

Ateca-Amestoy, V., Serrano-del-Rosalet, R., & Vera-Toscano, E. (2008). The leisure experience. *The Journal of Socio-Economics, 37*, 64 -78.

Bilgic, A., Florkowski, W.J., Yoder, J., & Schreinerd, D.F. (2008). Estimating fishing and hunting leisure spending shares in the United States. *Tourism Management, 29*, 771-782.

Dardis, R., Soberon-Ferrer, H., & Patro, D. (1994). Analysis of leisure expenditures in the United States. *Journal of Leisure Research, 26*(4), 309 -321.

Hong, G.S., Fan, J.X., Palmer, L., & Bhargava, V. (2005). Leisure travel expenditure patterns by family life cycle stages. *Journal of Travel and Tourism Marketing, 18*(2), 15-30.

Jara-Díaz, S.R., Munizaga, M.A., Greeven, P , Guerra, R., & Axhausen, K. (2008). Estimating the value of leisure from a time allocation model. *Transportation Research Part B, 42*, 946 - 957.

Moore, K., Cushman, G., & Simmons, D. (1995). Behavioral conceptualization of tourism and leisure. *Annals of Tourism Research, 22*(1), 67-85.

Parr, M.G., & Lashua, B.D. (2004). What is leisure? The perceptions of recreation practitioners and others. *Leisure Sciences,* 26(1), 1-17.

Paulin, G. (2012). Travel expenditures, 2005–2011: spending slows during recent recession. Beyond the Numbers: Prices and Spending, 1(20). Available at http://www.bls.gov/opub/btn/volume-1/travel-expenditures-2005-2011-spending-slows-during-recent-recession.htm.

Sung, H.H., Morrison, A.M., Hong, G., & O'Leary, J.T. (2001). The effects of household and trip characteristics on trip types: a consumer behavioral approach for segmenting the U.S. domestic leisure travel market. *Journal of Hospitality and Tourism Research, 25*(1), 46 - 68.

Vogel, H.L. (2015). Entertainment industry economics: A guide for financial analysis. 9th edition, Cambridge University Press.

van der Meer, M.J. (2008). The sociospatial diversity in the leisure activities of older people in the Netherlands. *Journal of Aging Studies, 22*, 1-12.

Weagley, R.O., & Huh, E. (2004a). The Impact of retirement on household leisure expenditures. *The Journal of Consumer Affairs*, *38*(2), 262-281.

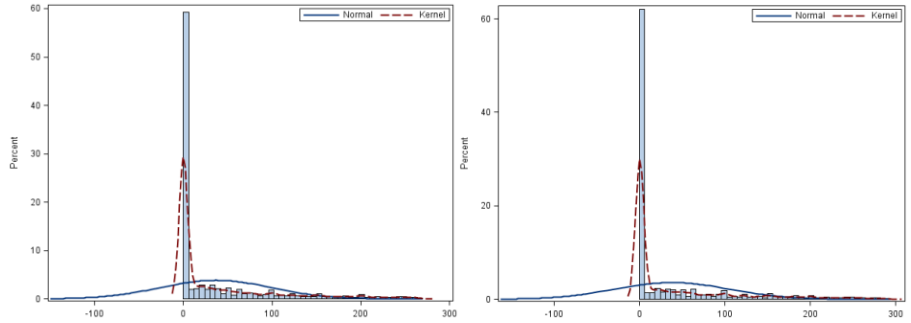
Weagley, R.O., & Huh, E. (2004b). Leisure expenditure of retired and near-retired households. *Journal of Leisure Research, 36*(1), 101-127.

White, R. (2012). Household entertainment spending up 58% since 1995. Leisure eNewsletter, 7(7). Available: http://www.whitehutchinson.com/news/lenews/2012_november/article102.shtml#article .

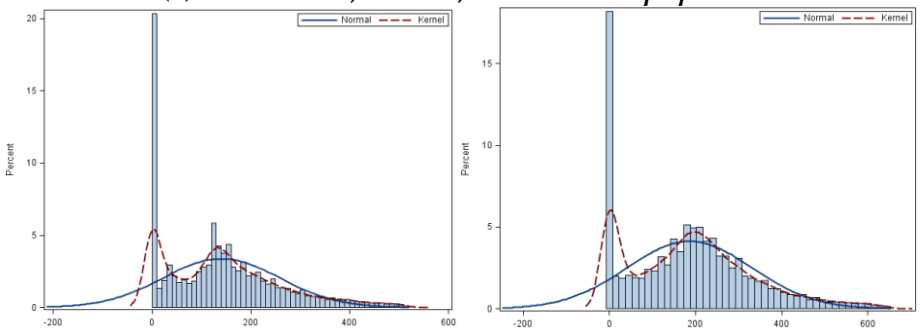
Zheng, B., & Zhang, Y. (2011). Household expenditures for leisure tourism in the USA, 1996 and 2006. *International Journal of Tourism Research*, *15*(2), 197-208.

Figure 1. Kernel Densities of Expenditures in 2003 (left) and 2010(right)

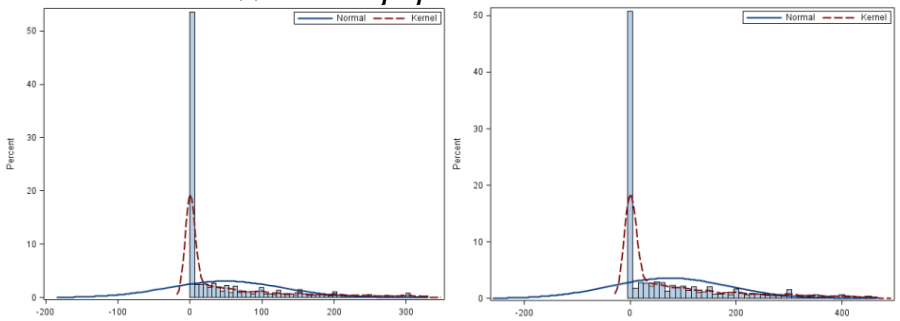
(a) Fees and Admissions



(b) Televisions, Radios, and Sound Equipment

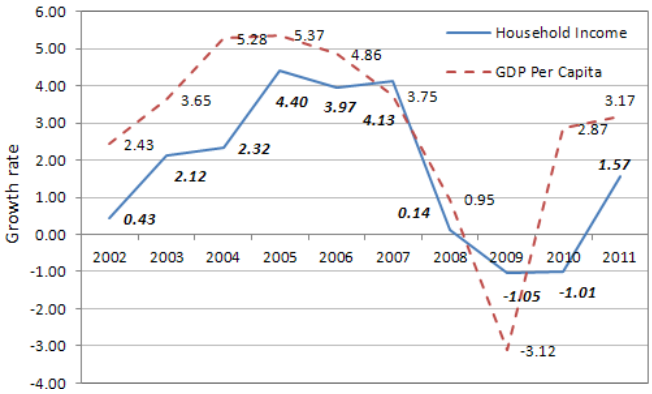


(c) Other Equipment and Services



Note: Clusters at $0.00 demonstrate high degree censored observations. Dashed lines are estimated kernel density functions, while the solid lines are density functions from the normal distribution. Substantial differences between these densities confirm the existence of censored observation.

Figure 2. US Income Growth Rates



Note: Median household income data is from the US Census Bureau. The GDP per capita data is obtained from the FRED.

Table 1. Recreation Expenditures and Household Income

	Nominal				*Real*			
	2003	2006	2008	2010	2003	2006	2008	2010
F&A	130	156	161	148	130	142	137	125
TV	191	235	256	240	191	214	218	203
Other	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 2011 CPI-U.

Table 2. Tobit Model Estimation Results

Fees and Admissions								
Variable	Tobit$_{03}$	OLS$_{03}$	Tobit$_{06}$	OLS$_{06}$	Tobit$_{08}$	OLS$_{08}$	Tobit$_{10}$	OLS$_{10}$
Intercept	-0.793‡	-0.156‡	-0.873‡	-0.171‡	-1.017‡	-0.208‡	-1.084‡	-0.144‡
Income	0.004‡	0.002‡	0.004‡	0.003‡	0.004‡	0.002‡	0.005‡	0.003‡
#Adults over 64	0.004	-0.007	-0.014	0.000	-0.014	-0.013†	0.039‡	0.020‡
#Children	0.018‡	0.028‡	0.042‡	0.044‡	0.052‡	0.041‡	0.045‡	0.042‡
Age	-0.002‡	0.001‡	-0.002‡	0.001‡	-0.001†	0.002‡	-0.003‡	0.001†
Family size	-0.006	-0.013‡	-0.023‡	-0.023‡	-0.028‡	-0.021‡	-0.025‡	-0.021‡
Family with children	0.079‡	0.028‡	0.053‡	0.018†	0.100‡	0.050‡	0.103‡	0.043‡
Male	0.054‡	0.018‡	0.032‡	0.015†	0.020†	0.001	0.026†	0.004
Married	0.057‡	0.027‡	0.088‡	0.031‡	0.099‡	0.036‡	0.078‡	0.015*
White	0.187‡	0.045‡	0.195‡	0.048‡	0.195‡	0.039‡	0.175‡	0.027‡
College	0.290‡	0.076‡	0.320‡	0.084‡	0.359‡	0.097‡	0.384‡	0.079‡
Urban	0.137‡	0.047‡	0.128‡	0.052‡	0.168‡	0.060‡	0.234‡	0.052‡
Televisions, Radios, and Sound Equipment								
Variable	Tobit$_{03}$	OLS$_{03}$	Tobit$_{06}$	OLS$_{06}$	Tobit$_{08}$	OLS$_{08}$	Tobit$_{10}$	OLS$_{10}$
Intercept	-0.098‡	0.042‡	-0.014	0.094‡	-0.011	0.096‡	-0.028†	0.072‡
Income	0.002‡	0.001‡	0.002‡	0.001‡	0.001‡	0.001‡	0.001‡	0.001‡
#Adults over 64	-0.030‡	-0.023‡	-0.016†	-0.016‡	-0.018‡	-0.014‡	-0.021‡	-0.021‡
#Children	-0.018‡	-0.006*	-0.024‡	-0.013†	-0.021‡	-0.013‡	-0.012‡	-0.007†
Age	0.000	0.000	-0.000†	-0.000	0.000	0.000	0.001‡	0.001‡
Family size	0.030‡	0.018‡	0.024‡	0.015‡	0.027‡	0.018‡	0.021‡	0.014‡
Family with children	0.022‡	0.016‡	0.033‡	0.028‡	0.020‡	0.017‡	0.007	0.004
Male	0.017‡	0.014‡	0.007	0.010†	0.010*	0.014‡	0.011‡	0.014‡
Married	0.032‡	0.014‡	0.048‡	0.026‡	0.053‡	0.036‡	0.055‡	0.041‡
White	0.041‡	0.018‡	0.034‡	0.017†	0.055‡	0.032‡	0.033‡	0.018‡
College	0.063‡	0.033‡	0.066‡	0.039‡	0.063‡	0.042‡	0.060‡	0.041‡
Urban	0.036‡	0.027‡	0.036‡	0.031‡	0.012	0.016	0.019†	0.020‡
Other Equipment and Services								
Variable	Tobit$_{03}$	OLS$_{03}$	Tobit$_{06}$	OLS$_{06}$	Tobit$_{08}$	OLS$_{08}$	Tobit$_{10}$	OLS$_{10}$
Intercept	-1.570‡	0.024	-1.638‡	-0.007	-1.157‡	0.007	-1.272‡	-0.007
Income	0.007‡	0.003‡	0.005‡	0.003‡	0.004‡	0.002‡	0.005‡	0.002‡
#Adults over 64	-0.061†	0.009	-0.160‡	-0.043†	-0.120‡	-0.023	-0.132‡	-0.041‡
#Children	0.004	0.018	-0.019	0.018	0.028	0.043‡	0.023	0.041‡
Age	-0.006‡	-0.000	-0.006‡	0.000	-0.005‡	-0.000	-0.005‡	0.000
Family size	0.063‡	-0.004	0.077‡	-0.007	0.061‡	-0.006	0.061‡	-0.008
Family with children	0.106‡	-0.017	0.038	-0.016	0.028	-0.016	-0.004	-0.058‡
Male	-0.078‡	0.015	-0.102‡	-0.004	-0.109‡	-0.012	-0.119‡	-0.008
Married	0.328‡	0.054‡	0.305‡	0.049†	0.334‡	0.110‡	0.312‡	0.073‡
White	0.646‡	0.080‡	0.765‡	0.105‡	0.631‡	0.131‡	0.535‡	0.076‡
College	0.391‡	0.052‡	0.305‡	0.026*	0.310‡	0.070‡	0.259‡	0.047‡
Urban	-0.227‡	-0.059†	-0.185‡	-0.055*	-0.218‡	-0.055†	-0.105†	-0.015

Note: ‡, †, and *denote significance at the 1%, 5%, and 10% level, respectively.

NOT-FOR-PUBLICATION APPENDIX

A1. 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

Reference: Consumer Expenditure Survey.

A2. 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 deviations and percentages of frequency are in parenthesis.