

Corvinus University of Budapest

Doctoral School of Economics and Business Informatics

THESIS BOOKLET:

The Heterogeneity of Consumer Behavior:
Analyzing Entertainment Expenditures in Relation to
Lifecycles, Business Cycles and Demographic
Influences

Péter Simon

Budapest, 2025

Table of Contents

Table of Contents.....	1
List of Figures	2
List of Tables	3
1. Research Background and Justification for the Selection of the Topic	4
1.1 Research Gap and Problem Statement	4
1.2. Choice of Spending Category: Entertainment.....	5
1.3. Significance and Contribution	6
1.4. Overview of Data and Methodology.....	11
2. The Methods Used	14
2.1. Models.....	14
3. Scientific Results of the Dissertation	18
3.1. Fixed Effect Estimation of the Income Elasticity of Expenditure on Entertainment Goods and Services.....	18
3.2. Results of the Pseudo-Panel Analysis of Cohort-Level Data	23
4. Main references	27

List of Figures

Figure 1: Average Annual Expenditure on Entertainment per Household by Quintiles (Normalized to 2009)	13
Figure 2: Smoothed Data (HP Filter) for Total Spending on Fees and Admissions Covering All, Low-Income and High-Income Groups between 1996 and 2019.....	22

List of Tables

Table 1 Average After-Tax Income and Average Entertainment Spending per Household in Different Income Quintiles in years 2000, 2003, 2006 and 2009. In dollars, not CPI-adjusted.....	12
Table 2: Pre-recession Fixed Effect Results for Regressing Log Total Entertainment Spending on Log After Tax Income (2005-2007).....	19
Table 3 Recession Fixed Effect Results for Regressing Log Total Entertainment Spending on Log After Tax Income (2008-2010).....	20
Table 4: Pseudo-Panel Regression Results	24

1. Research Background and Justification for the Selection of the Topic

1.1 Research Gap and Problem Statement

Understanding consumer behavior is central to the field of economics and related social sciences. It provides crucial insights into individual and household decision-making processes, influencing not only market dynamics and economic performance but also individual well-being. Economic modeling usually commences with simplifying assumptions, such as constant parameters and representative agents. Macroeconomic literature traditionally assumes homogenous consumers. In its simplest form, the Keynesian model uses an aggregated consumption function: $C = a + bY$, where C is aggregate consumption at a given time, Y is aggregate income at the same time, and a and b are known positive constants, b known as the marginal propensity to consume. Here, heterogeneity is ignored due to the nature of this aggregated consumption function. Friedman (1957) sets the micro foundation for aggregated consumption functions, admitting that his consumption function is generally based on the homogeneity of consumers where heterogeneity is limited, for example to income (Friedman, 1957, p. 18.). In addition, the early work of Milton Friedman and Gary Becker analyzes consumption functions in macro fluctuations (Friedman and Becker, 1957). However, the progression of economic analysis increasingly focuses on understanding heterogeneity among decision-makers, the smaller details of differing behavioral patterns across distinct groups, and the evolution of these behaviors over time. Hsiao, Shen and Fujiki (2004) provides an elaborate literature review on the topic, listing many economists have shown that the dynamics of aggregate variables often differ from those of micro-variables used in various studies, such as Granger (1980), Lewbel (1992, 1994), Stoker (1993), Forni and Lippi (1997, 1999), Abadir and Talmain (2002), Pesaran (2003). The business cycles also play an important role in the consumption of households, as analyzed by Hall (1986). At the same time, such analyses still focus on aggregate consumption, assuming homogeneity of consumers – which is a major simplification, as people do spend differently, since they have different preferences, resources etc. In short, consumers differ. It is essential to ask the question whether aggregate averages truly

represent the underlying dynamics of consumer behavior. The current study extends on this trend to show the heterogeneous spending behavior of different groups of people at different business cycles and through time. This study shows that *different income groups have different shares of consumption, and react differently, and such reaction also changes through time while demographic characteristics also have a vital role in the consumption behavior of households through their lifecycle and through business cycles.*

This study provides strong evidence that understanding smaller, more granular details at the subcategory level within specific market segments can be crucial, as aggregated data can conceal significant variations in consumer behavior. To present such contrasting differences, this paper digs deeper into specific yet significant spending categories and a critical service sector to reveal potential market-specific dynamics. It is not evident how households allocate their resources across various discretionary subcategories, nor is it fully understood whether different income groups exhibit different responses to economic shocks or how individual perceptions shape the adoption of new technologies (Devlin-Foltz and Sabelhaus, 2016). Investigating these disparities can be crucial for a more comprehensive understanding of consumer behavior and for providing informed recommendations that can contribute to more effective and better policymaking or business decisions. This knowledge gap leads to an incomplete picture of consumer behavior, preventing both researchers and policymakers in the private and public sectors from making more informed decisions. For example, ignoring behavioral heuristics and context-driven decision-making undermines the effectiveness of consumer policy, as Reisch and Zhao (2017) argues. This dissertation contributes to this broad field by examining the diverse factors that shape consumer choices, focusing specifically on the heterogeneity of these behaviors across different income levels, lifecycle stages, and contextual settings.

1.2. Choice of Spending Category: Entertainment

As early as the Great Depression, entertainment spending was around 5.4 percent of total household expenditures between 1934 and 1936 (Chao and Utgoff, 2006, p. 20). In 2008, around the start of the Great Recession, entertainment spending comprised around 5.6 percent of total household expenditures. However, it fell significantly throughout the recession and got back up to only about 4.9 percent by

2013, falling short of recovering to pre-recession values (Foster, 2015). At the beginning of the 21st century, entertainment accounted for approximately \$203 billion in spending in the US, making it nearly three times as much as the expenditure on education (Tseng, 2003, p. 73). Analyzing discretionary spending categories such as entertainment is a popular choice in current literature, as well. Coibion et al. (2021) using European Central Bank data demonstrates that entertainment spending declines most sharply during uncertainty, underscoring its analytical usefulness during downturns. As another example, Dao, Jirasavetakul and Zhou (2024) shows that recreation spending responds strongly to income changes in the US, highlighting its value in understanding consumption patterns during economic shifts.

Entertainment spending is divided into three main parts in the data source used in this paper, the Consumer Expenditure Survey of the US Bureau of Labor Statistics (BLS). In 2000, about 28% of entertainment spending went toward fees and admissions, which cover costs such as out-of-town travel, recreational class fees and tickets for sports games, theater, movies, and live concerts. Around 33% was devoted to televisions, radios, and sound equipment, including items like TVs, DVD players, VCRs, CD players, gaming consoles and accessories, speakers, and other sound systems. The remaining around 39% fell under other entertainment goods and services, which included more variable expenses such as toys, playground equipment pet-related expenses or buying or renting recreational vehicles and purchasing boats. Spending in this last category tends to shift significantly from year to year because these high-cost items—like motorboats or motorized campers—are purchased by only a small portion of consumers annually, so even small changes in the number of buyers can have a large impact on average spending (Tseng, 2003, p. 73). It is important to note, that both personal computers and cell phones got increasingly relevant as means of entertainment recently, but they are not included in the entertainment spending category (U.S. Department of Labor, 2004).

1.3. Significance and Contribution

While often underemphasized in consumption analyses, household entertainment expenditure can be considered a significant component of consumption with important implications for understanding consumer behavior as the current dissertation shows. The first empirical part (in Section 3) of the study investigates the

income elasticity of expenditure on entertainment across different income quintiles in the US, with a particular focus on the impact of the Great Recession while the second empirical part (in Section 4) focuses on the life cycle hypothesis and analyzes entertainment spending through cohorts in pseudo-panel regressions. In the first empirical part, utilizing quarterly household-level data from the Consumer Expenditure Survey (CEX) from 1996 to 2019, panel regression models with robust fixed effects are employed to analyze the responsiveness of entertainment spending to income changes. Furthermore, the study also uses time series analysis on weighted CEX data to examine the evolving disparity in entertainment expenditure between low- and high-income households over the past two decades. The findings reveal heterogeneous responses across income groups, with low-income households exhibiting substantially lower income elasticity, which remains inelastic even during economic downturns. This contrasts with middle- and high-income groups, who adjust their entertainment consumption more readily. Additionally, the time series analysis indicates a widening gap in the level of entertainment spending between the bottom and top income quintiles. The findings of this study offer compelling empirical evidence that, for families with lower incomes, entertainment may be viewed more as a staple good than a luxury. Given their financial constraints, these households often prioritize spending on entertainment as an essential strategy for anyone improving overall well-being.

Entertainment goods and services have become increasingly prominent in public discourse due to technological and cultural developments over recent decades. As digital platforms, for example streaming services and social media, redefine how entertainment is consumed, the relevance of examining expenditure patterns in this sector has grown (Gil, Ravid and Sorenson, 2025). Beyond that it might not be classified as a staple good, entertainment spending serves critical psychological and social functions, fostering mental well-being and community engagement.

In general, entertainment goods and services are not considered as essential consumption goods. An important question is whether it is true. Plus, consumers forming their entertainment expenditure decisions in bad economic times can lead to interesting behavioral implications. While not serving physiological needs, this spending category is undoubtedly related to psychological factors and mental well-being (Bell et al., 2024). The unarguably important topic of inequality in access to staple goods based on income levels is related to poor economics and deep poverty.

However, looking at income barriers related to expenditures supporting mental health is perhaps a more sophisticated and not a less valuable approach in the field. Entertainment relates well to well-being and is a significant spending category.

Given its nature, one might be right to assume that entertainment as an expenditure category is likely to react almost immediately to bad economic times. Although it is not rare to encounter preordered event tickets, most spending in this category reflects instantaneous decisions. For instance, going to the theater, repairing your television, or buying audio discs, videogames, or radios do not require deep financial planning in advance or a mortgage. Therefore, it is reasonable to assume a high adjustability to the financial conditions of the examined household, or, in other words, a high income-elasticity.

Along with nearly negligible lag effects, this category makes a good subject for analyzing both the impact of recessions and the inequality between income groups. Inequality and recessions are undoubtedly interesting topics, and there is ample literature on consumption inequality in recessions; see, for instance, Meyer and Sullivan (2013). However, there remains a research gap in examining this spending category. Closely related to the subject matter, Kim and Gao (2017) analyze entertainment expenditures during the Great Recession; however, their paper omits a comparison between income groups, additionally their model does not apply the weighting suggested and used by the Bureau of Labor Statistics for the Consumer Expenditure Survey dataset. Such weighting is applied to transform sample estimates into population estimates when analyzing the data of the BLS.

This paper contributes to the existing literature by delving into the detailed dynamics of entertainment spending during economic downturns, particularly through the lens of income disparities. While prior studies have established the significance of consumption patterns in response to economic fluctuations (such as, Hall, 1986, De Nardi, French and Benson, 2012, Reed and Crawford, 2014, De Giorgi and Gambetti, 2015), the current research uniquely focuses on the psychological and emotional factors influencing entertainment expenditures, which are often overlooked in traditional analyses focused on the demand for necessities and physiological necessities. By investigating how different income groups adjust their spending on entertainment—an inherently non-essential but psychologically vital category—this study aims to fill a critical gap in understanding the interplay between economic changes and consumer behavior.

The theoretical framework for the current study uses aspects of poverty traps, where constrained financial resources limit households' ability to adjust their spending dynamically. This concept is particularly relevant for low-income households, where entertainment spending may be “locked in” at a low level. Conversely, higher-income households are more flexible in adapting their expenses to varying economic conditions. Therefore, they can more easily change their discretionary spending, leading to potential widening disparities in expenditure patterns.

Given the increasing role of entertainment in contemporary economies, understanding these dynamics is crucial (Vogel, 2007). For example, while digital streaming services have expanded accessibility, traditional forms of entertainment—such as concerts or theater performances—remain cost-prohibitive for many low-income households. These disparities underscore broader inequalities in access to cultural and psychological resources, raising essential questions about the social implications of income-driven differences in spending.

Entertainment expenditure, as a primarily discretionary spending category, offers a unique lens through which to examine household responses to both lifecycle changes and broader macroeconomic fluctuations. Compared to necessities, spending on entertainment commonly can be considered a higher income elasticity, making it particularly sensitive to changes in economic conditions and consumer confidence. During economic downturns, households may be more likely to reduce spending on non-essential goods like entertainment, while conversely, increased disposable income during economic expansions might lead to a greater proportional increase in entertainment expenditure. The key question would be whether this assumption is true or not. Plus, whether different income groups spend differently based on their changing income through economic cycles is an important factor, as well.

This research directly investigates this relationship, analyzing how entertainment spending evolves over the lifecycle and how it is affected by macroeconomic fluctuations, such as recessions. Previous works, such as Kim and Gao (2017), have highlighted the sensitivity of entertainment spending to income changes, with wealthier households potentially exhibiting different patterns of adjustment compared to those with lower incomes. By focusing on the income elasticity of expenditure on entertainment across different lifecycle stages and during different economic cycles, this study can provide valuable insights into the cyclical nature of discretionary spending and its role in aggregate consumption dynamics. This

understanding can be relevant for macroeconomic models and policy interventions aimed at stabilizing economic activity and improving consumer well-being.

In the second empirical part of this thesis, the intricate relationship between household consumption behavior, individual lifecycle trajectories, and macroeconomic fluctuations stands as a cornerstone of economic inquiry. It is paramount for effective macroeconomic modeling, forecasting, and the design of targeted policy interventions to understand how households allocate their resources over time, and how these allocations are changed by economic shocks. Traditional theoretical frameworks, most notably the Lifecycle Hypothesis (LCH) pioneered by Modigliani and Brumberg (1954), posit that rational individuals engage in forward-looking behavior, strategically planning their consumption and saving decisions to smooth their utility over their entire lifespan, independent of transient income variations. This theoretical ideal suggests that individuals anticipate their future income streams and adjust current spending to maintain a relatively stable consumption path (Deaton, 2005).

However, the empirical validity of the LCH has been subject to extensive scrutiny, with a wealth of evidence revealing systematic deviations from its core statements. Real-world consumption patterns are often more closely tied to current income than the LCH would suggest, particularly for certain segments of the population. A critical challenge to the LCH's explanatory power lies in the prevalence of liquidity constraints, which impede the ability of many households, especially those with lower incomes, less savings or limited access to credit, for instance. These constraints force households to rely more on current income for consumption, making the LCH's assumption of smooth consumption over time unrealistic for certain segments of the population. Furthermore, behavioral factors and psychological biases can lead consumers to prioritize transitory income or make seemingly myopic financial decisions that deviate from long-term optimal plans.

Given these limitations of aggregate, representative-agent models, a more detailed understanding of consumption dynamics may require shifting the focus to heterogeneity across income groups and the analysis of disaggregated expenditure data. The previous discussion highlighted the crucial finding that income elasticity of spending can vary substantially across socioeconomic strata, implying that households with different income levels exhibit distinct behavioral responses to economic expansions and contractions. Lower-income households, often characterized by

greater financial precarity, may demonstrate a higher sensitivity of their spending to negative income shocks and a more pronounced reallocation of resources during economic downturns compared to their wealthier counterparts.

This study centers its investigation on entertainment expenditure, a category of discretionary spending widely recognized for its sensitivity to changes in both income and broader economic conditions (Coibion et al., 2021; Dao, Jirasavetakul and Zhou, 2024). As a generally non-essential component of household budgets, entertainment often serves as a leading indicator of consumer sentiment and can be among the first expenditure categories to be adjusted in response to perceived or actual economic distress. By focusing on this specific expenditure category, this paper aims to provide deeper insights into how different income groups alter their consumption patterns in response to lifecycle stages and macroeconomic fluctuations. By disaggregating consumer behavior, this dissertation comprehensively analyzes the heterogeneity of consumer entertainment expenditures, demonstrating how spending patterns uniquely differ across income groups during business cycles and evolve over household lifecycles, thereby revealing more detailed behavioral dynamics crucial for effective economic policy and business strategy.

1.4. Overview of Data and Methodology

The analysis presented in this study aims to quantify these differences through robust econometric techniques, leveraging the Consumer Expenditure Survey (CEX) quarterly data of the US Bureau of Labor Statistics (BLS) to explore both short-term and long-term trends. By examining elasticity patterns across income quintiles and entertainment subcategories, this research offers deeper insights into how economic cycles influence consumption decisions, contributing to the broader discourse on inequality and consumer behavior. Adding to the poverty trap argument, this dissertation also looks at a time series analysis of aggregate spending by quintiles to analyze whether the gap in the level of entertainment spending has grown between the poor and the rich throughout the last 20 years. Table 1¹ shows the average income and the total expenditure on entertainment per quintile for years 2000, 2003, 2006 and 2009.

¹ While collecting descriptive statistics for Table 1, I only complete income reporters, as done in Tseng (2003), as well.

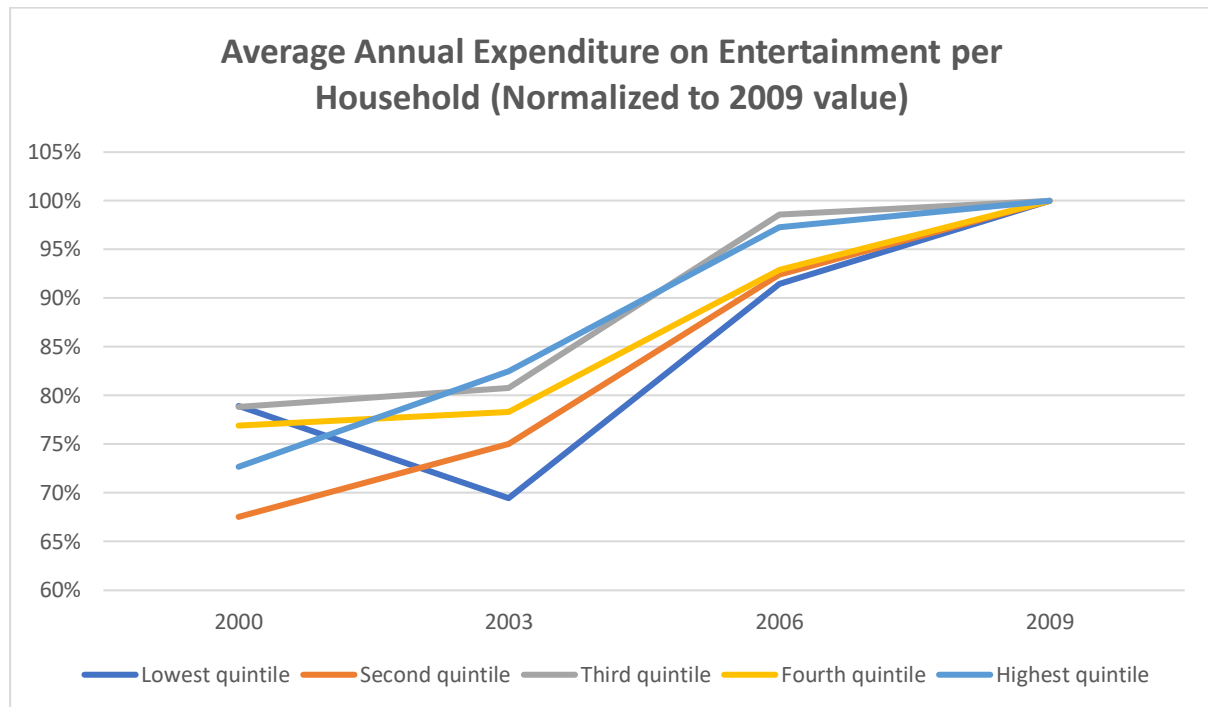
Table 1 Average After-Tax Income and Average Entertainment Spending per Household in Different Income Quintiles in years 2000, 2003, 2006 and 2009. In dollars, not CPI-adjusted.

Average Annual After-Tax Income per Household (in dollars)	2000	2003	2006	2009
Lowest quintile	8,042	8,612	9,690	10,264
Second quintile	19,202	21,514	24,692	25,584
Third quintile	32,144	36,515	41,451	43,685
Fourth quintile	50,889	58,812	66,397	70,913
Highest quintile	102,913	119,232	138,055	147,486
Average Annual Expenditure on Entertainment per Household (in dollars)	2000	2003	2006	2009
Lowest quintile	517	455	599	655
Second quintile	668	742	914	989
Third quintile	1043	1,069	1,304	1,323
Fourth quintile	1,543	1,571	1,864	2006
Highest quintile	2,467	2,799	3,303	3,394

The descriptive statistics in Table 1 already suggest heterogeneous consumption changes. For example, both after-tax income and expenditure on entertainment increased similarly, by around 26%, between 2000 and 2009 for the lowest quintile. At the same time, the expenditure on entertainment rose about 50% for the second quintile while their after tax income has only increased by 33% . In addition, the lowest quintile was the only income group to experience a decrease in entertainment spending throughout these years. Their expenditure from 2000 to 2003 dropped from 517 to 466 US dollars in this particular category. These differences already hint at visible differences between income groups when it comes to consumption changes.

Providing further background, Figure 1 illustrates the average annual expenditure on entertainment per household across different income quintiles, with the value for 2009 set at 100% for each quintile. The figure incorporates data from the years 2000, 2003, 2006, and 2009. It is clearly visible from the figure that the expenditure patterns of the lowest income quintile differ significantly from those of

Figure 1: Average Annual Expenditure on Entertainment per Household by Quintiles (Normalized to 2009)



the other quintiles. While all quintiles increase their average annual expenditure on entertainment, the lowest has a steep drop from 80% to around 70%, when taking 2009 as the 100%. While this tendency is visible from Table 1, as well, it is more straightforward from Figure 1.

Analyzing Table 1 and Figure 1 prompts crucial questions one must consider, such as whether these values remain stable over time or if they exhibit fluctuations. Additionally, can we pinpoint consistent shares among the various observations? Understanding the stability or volatility of these values is essential, as it could provide insights into underlying trends and help decision-makers in both the private and public sectors make more informed decisions. Analyzing the data for patterns or irregularities might reveal whether certain shares maintain their relevance across different time periods, or if they shift based on external factors.

2. The Methods Used

This paper uses the Consumer Expenditure Survey (CEX) quarterly data of the Bureau of Labor Statistics (BLS) on the household (a.k.a. consumer unit in the survey) level² (U.S. Department of Labor, 2025).

The dataset's income files (named “FMLI”³) are used for income and expenditure variables, and weighted estimates are calculated based on the adjustment method described by the BLS⁴. Since the FMLI data files include a great variety of demographic control variables, there is no need to include other survey datasets for the current research⁵. All the descriptive statistics and analyses of this section uses this dataset, available from the BLS website at: https://www.bls.gov/cex/pumd_data.htm#stata (U.S. Department of Labor, 2025). The only other data source used in this study is from the World Bank, available at the FRED website: <https://fred.stlouisfed.org/series/CPALCY01USQ661N>; this is where I retrieve Consumer Price Index (CPI) data for CPI adjustment (Organization for Economic Co-operation and Development, n.d.).

The independent variable is after-tax income, and the dependent variable is spending on entertainment. Then, the breakdown is made into two main categories: F&A and TRS. In addition, demographic variables are included, as described in the following section.

2.1. Models

This section presents the econometric model formulated to estimate the relationship between income and entertainment expenditures. This analysis aims to explore how household characteristics and economic conditions, particularly during recessions, influence spending behaviors across various income groups. The following

² This is publicly available on the site of BLS: https://www.bls.gov/cex/pumd_data.htm#stata

³ These files, containing “fmli” text in their names, can be found in the “Interview (zip)” files found at https://www.bls.gov/cex/pumd_data.htm#stata.

⁴ See Section 6.3 in <https://www.bls.gov/cex/pumd-getting-started-guide.htm>

⁵ Although a further breakdown of the spending categories with the help of the MTBI datasets would be useful to further analyze the topic, the more detailed dataset resulted in insufficient number of observations in the research phase of this study.

model estimates the relationship between income and entertainment expenditures in the main part of the analysis, where fixed effects regression is applied.

Equation (3) below estimates the fixed effect model:

$$\begin{aligned} \log(Y_{it}^{j,k,s}) = & \beta^{j,k,s} \cdot \log(Inc_{it}^{k,s}) + (X_{it}^{k,s})' \gamma^{j,k,s} \\ & + \delta_t^{j,k,s} + \alpha_i^{j,k,s} + \varepsilon_{it}^{j,k,s} \end{aligned} \quad (1)$$

- i : household
 - t : time (year-quarter)
 - k : income group (all groups, lowest quintile or highest quintile)
 - s : regime (pre-recession: 2005-7 or recession: 2008-10)
 - j : spending type (total entertainment, fees and admissions, or TVs, radio and sound equipment)
-
- $Y_{it}^{j,k,s}$: outcome variable — entertainment spending category j , for household i in income group k , at time t during period s
 - $\beta^{j,k,s}$: coefficient on income in period s (e.g., pre-recession vs. recession) for households in income group k spending on subcategory j
 - $Inc_{it}^{k,s}$: income for household i in income group k at time t during period s
 - $(X_{it}^{k,s})'$: vector of controls (age, family size, etc.) for household i from income group k at time t during period s
 - $\gamma^{j,k,s}$: corresponding control coefficients (vary by model) for category j during period s
 - $\delta_t^{j,k,s}$: time fixed effects (i.e. year-quarter dummies) at time t during period s for households in income group k spending on subcategory j
 - $\alpha_i^{j,k,s}$: household fixed effects for household i in income group k spending on subcategory j during period s

- $\varepsilon_{it}^{j,k,s}$: error term

The choice of control variables in the estimations is inspired by Gao and Kim (2017) and is similar to those in other papers, such as Campos-Soria, Inchausti-Sintes and Eugenio-Martin (2015). The main significant difference is the addition of both household and time fixed effects to the model.

The variables with variable names in parentheses are as follows: General CPI (*cpi*), sectoral CPIs (*cpi_entavg*, *cpi_livent*, *cpi_recre*, *cpi_audvid*, *cpi_sat*, *cpi_musicinst*), Sectoral CPIs are averaged out to produce the *cpi_entavg* variable. Number of household members over the age of 64 (*persot64*), age of the reference person in the household (*age_ref*) along with its squared form (*age²*), number of household members (*fam_size*), number of non-adults (*perslt18*), number of children (*child*), gender dummy (*male*), marital status dummy (*married*), whether the reference person attended college (*college*), whether household lives in an urban area (*urban*) and three-quarter dummies (*q1*, *q2*, *q3*). For the fixed effect regression, dummies on each quarter-year pair are used for time fixed effects (*qdate*). The squared form of age is added to model the effect of age more precisely, accounting for a possibly non-linear relationship between age and the spending variable.

The first empirical part of the study employs fixed-effects panel regression to estimate the income elasticity of entertainment expenditure. This approach controls for unobserved household-specific factors, such as cultural preferences or geographic characteristics, that might influence spending behavior. In addition, it also controls for time fixed effects.

The second empirical part of the study employs pseudo-panel regression. The primary model here is a regression equation where the dependent variable is the cohort-level average expenditure on the different entertainment subcategories (Fees and Admissions (FA), and Televisions, Radios, and Sound Equipment (TRS)), and the main independent variable is the cohort-level average after-tax income, adjusted for inflation using the Consumer Price Index (CPI). The model also includes cohort-level measures of income volatility and demographic control variables (age, household size, education level, and urban/rural status) in the regression to account for potential confounding factors.

A general form of the pseudo-panel regression equation for a specific entertainment subcategory j could be represented as:

$$\begin{aligned} \log(Y_{it}^j) = & \beta_1^{(j)} \cdot \log(\text{Inc}_{it}) + \beta_2^{(j)} \\ & \cdot [\log(\text{Inc}_{it}) \times \text{Recession}_t] + X_{it}'\gamma^{(j)} \\ & + D_t'\theta^j + \alpha_i + \varepsilon_{it}^j \end{aligned} \quad (2)$$

- i : cohort
- t : time (year)
- j : spending type (total entertainment, fees and admissions, or tvs radio and sound equipment)
- Y_{it}^j : cohort-average spending outcome of type j at time t
- $\beta_1^{(j)}$: coefficient on income
- Inc_{it} : average log income of cohort i at time t
- $\beta_2^{(j)}$: coefficient on the interaction term of income and recession
- Recession_t : dummy = 1 if time t is in a recession
- X_{it}' : cohort-aggregated control variables (age, family size, etc.) for cohort i at time t
- $\gamma^{(j)}$: corresponding control coefficients (vary by model) for category j
- D_t' : seasonal dummies (Quarter 2 to Quarter 4 dummies)
- θ^j : Seasonal parameters
- α_i : cohort fixed effects for cohort i
- ε_{it}^j : error term

3. Scientific Results of the Dissertation

3.1. Fixed Effect Estimation of the Income Elasticity of Expenditure on Entertainment Goods and Services

This subsection examines how the total spending on entertainment changes with income for the different income groups both in recession and boom years. The total includes a wide variety of spending categories, for instance, spending on theatre or sports event tickets, recreational activities, art lessons, audio CDs, or even satellite TV subscriptions, while a breakdown to two categories (fees and admissions and TVs, radio and sound equipment) is also presented. The results presented in Tables 2 and 3 are from the model estimated by equation (3), where income groups (k) are in the separate columns for all, low- and high-income households, and regime (s) and spending type (j) take different values as described during the interpretation of the tables. For simplicity, the coefficients on year-quarters are excluded from these tables. This booklet only contains the results for spending type (j) taking the value all entertainment spending, while the output tables for subcategories F&A and TRS can be found in the main dissertation.

This thesis booklet only highlights the results when spending type (j) is total entertainment spending. These are presented in Table 2 for pre-recession years as the regime (s) and Table 3 for recession years as regime (s). The findings suggest substantial differences between the lower and higher income groups in the income elasticities and also in the change of elasticities in the recession. The tables show that the income elasticity of expenditure on entertainment products is estimated to be approximately 0.1 in boom and 0.05 in recession years when the whole sample is analyzed. More formally, a household with approximately the same characteristics (as per the control variables) but 1% higher income is expected to spend 0.1% more on entertainment in normal and 0.05% more in bad economic times. The elasticity in the case of the lowest quintile is 0.06 (with a standard error of 0.02) in both normal economic times and downturns – roughly speaking, this stays around 0. For the highest quintile, the elasticity experiences a decrease in the recession – from 0.36 to 0.25, both values significant at the 1% level, with standard errors around 0.06 for both time periods.

Table 2: Pre-recession Fixed Effect Results for Regressing Log Total Entertainment
Spending on Log After Tax Income (2005-2007)

VARIABLES	(1) All Income Groups	(2) Lowest Quintile	(3) Highest Quintile
linc	0.10*** (0.010)	0.06*** (0.021)	0.36*** (0.057)
age_ref	-0.00 (0.003)	-0.01 (0.006)	-0.00 (0.009)
fam_size	0.05** (0.021)	0.05 (0.062)	-0.01 (0.038)
perslt18	-0.06* (0.034)	-0.14 (0.106)	-0.08 (0.065)
child	-0.01 (0.047)	-0.02 (0.153)	0.10 (0.074)
persot64	-0.05 (0.048)	0.04 (0.112)	-0.26** (0.117)
male	0.14* (0.084)	-0.23 (0.279)	0.39 (0.247)
married	0.03 (0.105)	-0.15 (0.328)	0.45* (0.266)
white	-0.22** (0.108)	-0.14 (0.251)	-0.81*** (0.255)
college	-0.23** (0.097)	0.09 (0.238)	-0.62* (0.350)
Constant	5.93*** (0.240)	5.87*** (0.481)	3.51*** (1.019)
Observations	38,095	6,545	8,218
R-squared	0.03	0.01	0.04
Number of panelid	10,535	2,828	3,071

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 Recession Fixed Effect Results for Regressing Log Total Entertainment Spending on Log After Tax Income (2008-2010)

VARIABLES	(1) All Income Groups	(2) Lowest Quintile	(3) Highest Quintile
linc	0.05*** (0.008)	0.06*** (0.020)	0.25*** (0.058)
age_ref	-0.00 (0.003)	0.00 (0.006)	-0.00 (0.010)
fam_size	0.06*** (0.023)	0.00 (0.057)	0.10* (0.056)
perslt18	-0.07** (0.033)	0.11 (0.120)	-0.09 (0.072)
child	-0.01 (0.043)	-0.11 (0.124)	-0.07 (0.099)
persot64	-0.05 (0.042)	0.08 (0.101)	-0.10 (0.062)
male	0.06 (0.120)	-0.69** (0.308)	-0.16 (0.238)
married	0.19* (0.104)	0.04 (0.272)	0.30 (0.202)
white	0.21 (0.159)	0.32** (0.139)	0.66*** (0.179)
college	0.03 (0.117)	-0.18 (0.232)	-0.08 (0.291)
Constant	6.07*** (0.266)	5.49*** (0.437)	3.84*** (1.007)
Observations	38,082	6,712	8,131
R-squared	0.03	0.01	0.05
Number of panelid	10,617	2,783	2,893

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

These results imply the presence of visible inequality between the lowest and highest income groups when it comes to changing entertainment consumption as a reaction to income changes. On the other hand, entertainment can be considered a normal good at all and high-income levels in both normal and bad economic times with below-the-unit elasticity. Still, it seems to be inelastic for the lower quintile in both cycles. Although being a normal good for both the so-called poor and rich, elasticities of 0.06 and 0.36 or 0.25 are fundamentally different.

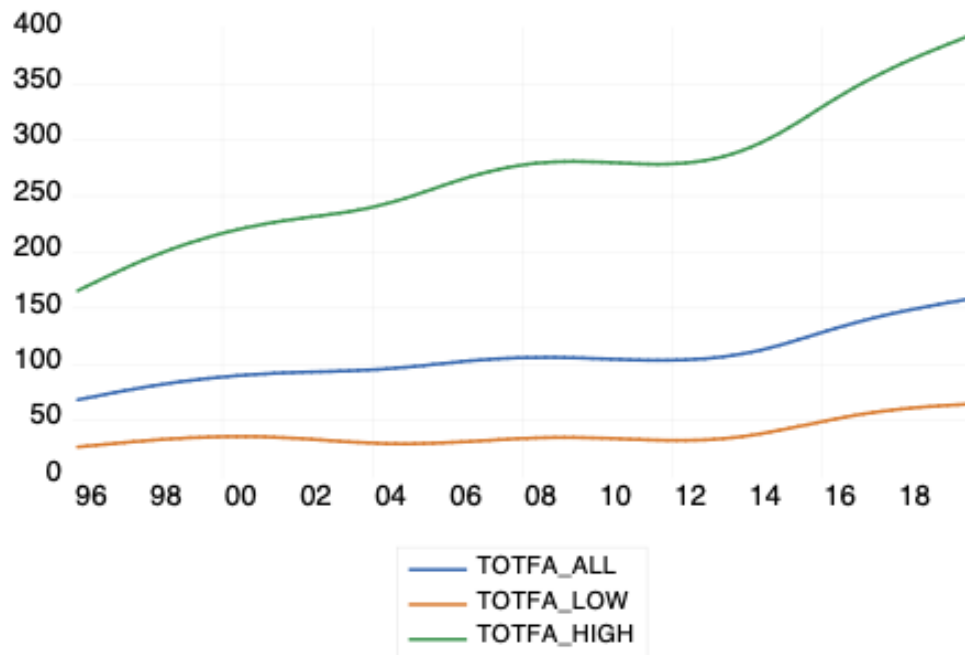
In the case of spending type “Televisions, Radios and Sound Equipment (TRS)” spending subcategory the results are similar, showing that the same inequality is there in boom years. While high-income households can, the lower-income households are not able to adjust their elasticity in recession years. The results for the subcategory “Fees and Admissions”, that is, when spending type (j) takes the value of fees and admissions, show that consumer behavior is similar to the case of TRS category. The results suggest that F&A tends to be a normal good with income elasticity below one for all and high-income households in both periods. However, the wealthy (i.e. highest income quintile) are more responsive to income changes in their F&A spending. The recession had a small, but positive impact on the income elasticity of F&A for the average consumer while the income responsiveness for the lowest income group remained around the same comparing the two regimes. This highlights the varying effects of economic downturns on discretionary spending across different income levels.

The varying income elasticities across entertainment subcategories reveal distinct spending behaviors. For instance, 'Fees and Admissions' expenditures exhibited greater responsiveness to income changes in pre-recession periods, potentially reflecting their more discretionary nature compared to 'Televisions and Radios,' which demonstrated lower income elasticity. Interestingly, the analysis suggests that higher-income households tend to adjust their spending on these entertainment categories during economic downturns, leading to a decrease in their income elasticity of expenditure for total spending and TVs, radios and sound equipment subcategory, while a slight increase is observable for the fees and admissions category. This contrasts with lower-income households, whose entertainment spending elasticity remains near zero for all the three analyzed spending types. At the same time, there is a decrease in recession years when looking at all income groups for all three spending types. After the current results, the study turns to the second part of this analysis, which employs time series methods, including seasonal adjustments and the Hodrick-Prescott (HP) filter, to further explore the underlying trends in entertainment expenditures over a longer period and across income groups.

The results from the HP filter reveal a growing disparity in entertainment spending between low- and high-income households in general. Over the analyzed period of 1996 to 2019, high-income households increased their entertainment

expenditure, while low-income groups exhibited stagnation, except for the case of TRS spending. This difference reveals the structural inequalities that exist within discretionary spending capabilities among different income groups. Low-income households, in particular, face a significant lock-in effect, which restricts their ability to modify their consumption patterns with the exception of TRS spending category, where they also increase their expenditures through time. Even during periods of economic recovery, these households encounter barriers that prevent them from taking advantage of improved financial conditions. As a result, their limited financial flexibility perpetuates a cycle of disadvantage, making it challenging for them to invest in opportunities that could enhance their quality of life. This situation highlights the urgent need for targeted policies that address these inequalities and support vulnerable households in navigating economic changes. The widening gap is most visible in the case of fees and admission spending type, for which the HP filter result is presented in Figure 2.

Figure 2: Smoothed Data (HP Filter) for Total Spending on Fees and Admissions Covering All, Low-Income and High-Income Groups between 1996 and 2019



3.2. Results of the Pseudo-Panel Analysis of Cohort-Level Data

Table 4 displays the estimated coefficients for the determinants of overall entertainment expenditure (*all*), total Fees and Admissions expenditure (*totfa*), and total Televisions, Radio and Other Sound Equipment expenditure (*tottr*) based on equation (5), where the separate values of spending type (j) are in separate columns taking values for total entertainment (column 1), F&A (column 2) and TRS (column 3) spending categories.

Table 4: Pseudo-Panel Regression Results

VARIABLES	(1) Total Entertainment	(2) Fees and Admissions	(3) TVs Radio and Sound Eq.
linc	0.42** (0.137)	0.43* (0.203)	0.32** (0.114)
recinc	0.16** (0.047)	0.21 (0.114)	0.17* (0.080)
recession	-1.91** (0.576)	-2.59 (1.401)	-2.09* (0.973)
popsize	0.16 (0.152)	-0.17 (0.121)	0.17 (0.166)
age_ref	0.02** (0.006)	0.00 (0.012)	0.03*** (0.007)
fam_size	-0.13 (0.337)	0.29 (0.207)	-0.07 (0.082)
perslt18	0.21* (0.110)	-0.21* (0.109)	0.11 (0.091)
child	0.33 (0.592)	1.03*** (0.278)	0.43 (0.321)
persot64	-0.08 (0.045)	0.02 (0.069)	0.05 (0.060)
male	0.13 (0.207)	0.15 (0.504)	0.11 (0.166)
married	0.08 (0.470)	-1.46** (0.424)	-0.14 (0.386)
white	1.60** (0.648)	1.25** (0.446)	1.05* (0.551)
college	0.54 (0.555)	0.57 (0.781)	0.32 (0.445)
urban	1.08* (0.487)	2.58*** (0.429)	2.25*** (0.610)
quarter2	0.06** (0.020)	0.06** (0.019)	-0.03* (0.014)
quarter3	0.05** (0.015)	0.05* (0.020)	0.00 (0.020)
quarter4	0.22*** (0.025)	-0.10*** (0.021)	0.28*** (0.025)
Constant	-1.78 (1.163)	-3.05 (1.905)	-2.64** (1.044)
Observations	352	352	352
R-squared	0.51	0.52	0.72
Number of cohort	8	8	8

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The findings offer several points of discussion when viewed through the lens of the Life-Cycle Hypothesis (LCH) and broader macroeconomic implications. The strong positive income elasticity of expenditure on entertainment across all measures aligns with the LCH's understanding that as permanent income rises over the life cycle, consumption of normal goods, such as entertainment, should also increase. The fact that this elasticity is slightly higher for Fees and Admissions might suggest a shift in preferences toward experiential leisure activities as households accumulate more resources over their lifetime.

Adding to this point, the significant role of demographic composition – such as marriage status, the presence of children or the location of residence – highlights that consumer behavior is heterogeneous and context-dependent. When interpreted alongside the income elasticities, these findings advance the current dissertation's central contribution: documenting how entertainment expenditures respond differently across income groups and business cycle phases (as seen in Section 3), and lifecycle stages, and different demographic characteristics (as seen in the current section). The findings that entertainment expenditures increase with income but less than proportionally indicates that these categories behave as normal, relatively inelastic goods at the cohort level. This suggests that while spending rises with greater resources, entertainment is not necessarily treated as a pure luxury. In addition, the significant recession interaction terms might imply that some positive cyclical adjustment occurs according to the idea of the lipstick effect. By disaggregating consumer behavior in this way, the analysis demonstrates that both lifecycle stage (coefficient on age and age composition of cohorts) and demographic structure are crucial for understanding how households change their entertainment consumption, thereby revealing heterogeneity that might have important direct implications for policy design and business strategy.

This heterogeneity might have implications for aggregate consumption patterns and the effectiveness of macroeconomic policies targeting different segments of the population. For instance, policies aimed at stimulating consumption during a recession might have varying impacts depending on these demographic characteristics and their propensity to adjust entertainment spending. The findings emphasize the importance of considering this heterogeneity when analyzing aggregate consumption responses to economic fluctuations and when formulating targeted policy

interventions. The observed seasonal patterns further suggest that factors beyond long-term life-cycle planning, such as within-year income fluctuations or seasonal preferences, also significantly influence entertainment expenditure. This highlights the complex interplay of various factors shaping consumption behavior, extending beyond the core assumptions of the basic LCH.

4. Main references

- Abadir, K., and Talmain, G. (2002). Aggregation, persistence and volatility in a macro model. *The Review of Economic Studies*, 69(4), 749–779. <https://doi.org/10.1111/1467-937x.00225>
- Aguiar, M., and Hurst, E. (2013). Deconstructing Life Cycle Expenditure. *Journal of Political Economy*, 121(3), 437–492. <https://doi.org/10.1086/670740>
- Bell, M., Popov, D., Karlsberg, S., Caldwell-Jones, G., Kearney, E., Bakes, J. (2024). Culture and Heritage Capital: Monetising the Impact of Culture and Heritage on Health and Wellbeing. *Frontier Economics*. https://assets.publishing.service.gov.uk/media/678e2ecf432c55fe2988f615/rpt_-_Frontier_Health_and_Wellbeing_Final_Report_09_12_24_accessible_final.pdf
- Campos-Soria, J. A., Inchausti-Sintes, F., and Eugenio-Martin, J. L. (2015). Understanding tourists' economizing strategies during the global economic crisis. *Tourism Management*, 48, 164–173.
- Chao, E. L., and Utgoff, K. P. (2006). 100 Years of U.S. Consumer Spending Data for the Nation, New York City, and Boston. *Bureau of Labor Statistics*. <https://www.bls.gov/opub/100-years-of-u-s-consumer-spending.pdf>
- Coibion, O., Georgarakos, D., Gorodnichenko, Y., Kenny, G., and Weber, M. (2021). The effect of macroeconomic uncertainty on household spending. *National Bureau of Economic Research*. <https://doi.org/10.3386/w28625>
- Dao, M., Jirasavetakul, F. L., Zhou, J. (2024). Drivers of Post-COVID private consumption in the U.S. IMF Working Paper, 2024(128), 1. <https://doi.org/10.5089/9798400281044.001>
- Deaton, A. (2005). Franco Modigliani and the Life Cycle Theory of Consumption. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.686475>
- De Giorgi, G., and Gambetti, L. (2015). Business cycle fluctuations and the distribution of consumption. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2646039>

- De Nardi, Mariacristina, French, E., and Benson, D. (2012). Consumption and the Great Recession (February 8, 2012). *Economic Perspectives*, 36(1).
<https://ssrn.com/abstract=2017759>
- Devlin-Foltz, Sebastian, and John Sabelhaus. "Heterogeneity in Economic Shocks and Household Spending in the US." *Fiscal Studies*, vol. 37, no. 1, Mar. 2016, pp. 153–192, <https://doi.org/10.1111/j.1475-5890.2016.12082>
- Forni, M., and Lippi, M. (1997). Aggregation and the microfoundations of dynamic macroeconomics. In Oxford University Press eBooks.
<https://doi.org/10.1093/oso/9780198288008.001.0001>
- Forni, M., and Lippi, M. (1999). Aggregation of linear dynamic microeconomic models. *Journal of Mathematical Economics*, 31(1), 131–158.
[https://doi.org/10.1016/s0304-4068\(98\)00060-3](https://doi.org/10.1016/s0304-4068(98)00060-3)
- Foster, A. C. (2015). Movies, music, and sports: U.S. entertainment spending, 2008–2013. *Prices and Spending, Bureau of Labor Statistics*, 4(6).
- Friedman, M. (1957). A Theory of the Consumption Function. National Bureau of Economic Research, 63.
https://ia801203.us.archive.org/22/items/in.ernet.dli.2015.136983/2015.136983.A-Theory-Of-The-Consumption-Function_text.pdf
- Friedman, M., and Becker, G. S. (1957). A Statistical Illusion in Judging Keynesian Models. *Journal of Political Economy*, 65(1), 64–75.
<https://doi.org/10.1086/257882>
- Gil, R., Ravid, S. A., and Sorenson, O. (2025). Talent and technology in creative industries: introduction to the special issue. *Journal of Cultural Economics*.
<https://doi.org/10.1007/s10824-025-09543-3>
- Granger, C. (1980). Long memory relationships and the aggregation of dynamic models. *Journal of Econometrics*, 14(2), 227–238.
[https://doi.org/10.1016/0304-4076\(80\)90092-5](https://doi.org/10.1016/0304-4076(80)90092-5)
- Hall, R. E., and Economic Research, N. B. (1986). *The Role of Consumption in Economic Fluctuations*. National Bureau of Economic Research.
- Hsiao, C., Shen, Y., and Fujiki, H. (2004). Aggregate vs Disaggregate Data Analysis - A Paradox in the Estimation of a Money Demand Function of Japan Under the Low Interest Rate Policy. SSRN Electronic Journal.
<https://doi.org/10.2139/ssrn.648704>

- Kim, H., and Gao, L. (2017). Consumer Spending on Entertainment and the Great Department of Economics, Auburn University.
- Lewbel, A. (1992). Aggregation with Log-Linear Models. *The Review of Economic Studies*, 59(3), 635. <https://doi.org/10.2307/2297869>
- Lewbel, A. (1994). Aggregation and simple dynamics. *American Economic Review*, 84(4), 905–918. <https://dialnet.unirioja.es/servlet/articulo?codigo=390537>
- Meyer, B. D., and Sullivan, J. X. (2013). Consumption and Income Inequality and the Great Recession. *American Economic Review*, 103(3), 178–183. <https://doi.org/10.1257/aer.103.3.178>
- Modigliani, F., Brumberg, R. E. (1954). "Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data" in K. K. Kurihara, ed., *Post-Keynesian Economics*. New Brunswick 1954.
- Organization for Economic Co-operation and Development (n.d.), *Consumer Price Index: Total, All Items for the United States [CPALCY01USQ661N*. (2021, June 22). <https://fred.stlouisfed.org/series/CPALCY01USQ661N>.
- Pesaran, M. H. (2003). Aggregation of linear dynamic models: an application to life-cycle consumption models under habit formation. *Economic Modelling*, 20(2), 383–415. [https://doi.org/10.1016/s0264-9993\(02\)00059-7](https://doi.org/10.1016/s0264-9993(02)00059-7)
- Reed, S., and Crawford, M. (2014). How does consumer spending change during boom, recession, and recovery? *Prices and Spending, Bureau of Labor Statistics*, 3(15).
- Reisch, L. A., and Zhao, M. (2017). Behavioural Economics, Consumer Behaviour, and Consumer Policy: State of the Art. *Behavioural Public Policy*, 1(2), 190–206. <https://doi.org/10.1017/bpp.2017.1>
- Stoker, T. M. (1993). Empirical Approaches to the Problem of Aggregation Over Individuals. *Journal of Economic Literature*, 31(4), 1827–1874. JSTOR. <https://doi.org/10.2307/2728329>
- Tseng, N. (2003). Expenditures on Entertainment. *Consumer Expenditure Survey Anthology. Bureau of Labor Statistics*. <https://www.bls.gov/cex/anthology/csxanth10.pdf>
- U.S. Department of Labor (2004). 2003 Consumer Expenditure Interview Survey Public Use Microdata Documentation. *Bureau of Labor Statistics*. <https://www.bls.gov/cex/2003/cex/csxintvw.pdf>

- U.S. Department of Labor (2025). Consumer Expenditure Surveys: PUMD Data Files. *Bureau of Labor Statistics*. https://www.bls.gov/cex/pumd_data.htm#stata. Accessed on March 4, 2022
- Vogel, H. L. (2007). Entertainment Industry Economics: A Guide for Financial Analysis. Cambridge University Press. https://api.pageplace.de/preview/DT0400.9780511276507_A23676925/preview-9780511276507_A23676925.pdf