Veblen Goods and Urban Distinction:
The Economic Geography of Conspicuous Consumption,
A Survey of 21 Cities

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ABSTRACT

A fundamental observation of 21st century cities is that they have become great centers of consumption. Some argue that their ability to generate consumer options is part and parcel of their success, particularly with regard to attracting highly-skilled human capital (Glaeser et al. 2001; Clark 2004; Handbury 2012; Diamond 2016). While extant studies of metropolitan consumer options lump them together as a large "amenities" variable associated with growth and skills, previous work has not highlighted the relationship between different types of consumer goods and the geographical location of where they are most consumed. These distinctions have implications for the relationship between consumerism and economic development both as an extension of the literature and in its practical application.

In this paper, we seek to understand the geographic variations of consumer behavior. Using Consumer Expenditure Survey (CEX), we analyze how consumption differs across 21 major U.S. metropolitan areas, and the association between urban characteristics and consumption. We expand previous geographic analysis of consumption to include luxury goods that are socially visible (conspicuous consumption) and luxury goods that are not visible (inconspicuous consumption). Our analysis shows that conspicuous consumption is more sensitive to an urban context and the variables associated with cities influence status spending. Overall, results suggest that the conspicuous consumption of a household is positively associated with size, density, residential segregation, and regional specialization of eating and drinking places of the metropolitan area in which the household is located; it is negatively associated with the metropolitan area's income inequality, income level of reference group, and housing cost. The results indicate that the importance of surrounding urban context in understanding what people consume, especially on status goods which often attain value through social visibility.

Keywords: Conspicuous Consumption; Consumer City; Metropolitan Distinction; Veblen Good

I. Introduction

A fundamental observation of 21st century cities is that they have become great centers of consumption. Within economic geography, consumption has been explored through three frameworks: that of amenities (Glaeser et al. 2001; Diamond 2016), that of high-end, luxury retail consumption that is primarily associated with urban living (Wrigley and Lowe 1996; Handbury 2012; Clark 2004; Currid-Halkett 2013), and that of the commodification of cultures (Zukin 1989, 1998, 2008; Fainstein and Judd 1999). Some argue that cities' ability to generate consumer options is part and parcel of their success (Glaeser et al. 2001; Clark 2004; Handbury 2012; Diamond 2016), while others suggest that amenities are a key driver in the attraction of skilled human capital (Florida 2002). Still others observe the coopting of culture and its translation into a commodity as a part of urban economic development (Zukin 1989). While extant quantitative studies of metropolitan consumer options lump them together as a large "amenities" variable associated with growth and skills, we argue that there is a much greater distinction across cities in their consumer behavior, and the distinctive patterns are closely related with socio-economic and industrial mix of cities. In short, the relationship between consumption of individual households and surrounding urban context must be unbundled.

This study will focus on understanding both the individual determinants and the contextual determinants of the consumption of luxury goods and those that reveal status. In so doing, this study will be the first to focus on the consumption of two classes of luxury goods that might be differentially affected by a metropolitan areas attributes. Conspicuous consumption or the consumption of visible luxury goods for the purposes of revealing status (Veblen 1899; Charles et al. 2009; Heffetz 2011, 2012) and inconspicuous consumption or the consumption of

hidden luxury, expensive goods such as education, retirement and travel are posited to vary across places due to socially motivations and other factors. Heffetz (2011, 2012) and Charles et al. (2009) find distinctions in conspicuous consumption across race and class. While we establish inconspicuous consumption as a new unique category of goods, others have looked at nonvisible luxury spending patterns. Most famously, Bourdieu (1984) found symbolic types of consumption that suggested social positon. More recently, Chetty et al. (2017) find that socioeconomic position is significant in intergenerational mobility, particularly for admittance to Ivy League universities. While these studies do not address inconspicuous consumption, per se, the results are indicative of a type of luxury spending that is not ostensibly for status but implies social position nonetheless. For example, Chetty et al. (2017) find that children with parents in the top 1% income distribution are 77 times more likely to attend an Ivy League university.

In this analysis, we use data from the Consumer Expenditure Survey in 21 metropolitan areas to test what are the individual- and the metropolitan-level characteristics that are associated with the consumption of visible and hidden luxury goods and consumption of other goods. The analysis uses both metropolitan level fixed effects and random effects models to identify the areas and the characteristics that are linked to conspicuous and inconspicuous consumption. In short, we find that metropolitan level amenities, income inequality, and segregation, are influences for conspicuous consumption, but do not influence other forms of consumption suggesting that the consumption of status goods is influenced by social context.

II. Literature Review

Since Adam Smith's *The Theory of Moral Sentiments* (1759) and Thorstein Veblen's *The Theory of the Leisure Class* (1899), scholars have sought to understand how consumer behavior reveals socio-economic position (Leibenstein 1950; Galbraith 1958; Deaton and Muellbauer 1980; Deaton 1992; Heffetz 2011; Rank et al. 2014, among others). In the past several decades, however, the study of consumption has begun to unpack the role of myriad different variables in shaping consumer choices, including race (Charles et al. 2009), age (Cook and Settensten 1995; Lee et al. 1997), gender (De Ruijter et al. 2005), generational position (Norum 2003), and even food consumption patterns (Yen 1993; Zan and Fan 2010). Others have sought to tease out the influence of children (Lino and Carlson 2010) and marriage (Walden 2002) on consumption practices. In the tradition of Deaton and Muellbauer (1980) and Piketty (2014), a number of scholars have looked at consumer behavior as it relates to inequality (Krueger and Perri 2006; Aguilar and Bils 2015; Rank et al. 2014; Chetty et al. 2016, 2017).

Within the extant literature on consumption, a seminal line of inquiry is the study of why people buy what they do for reasons that transcend practicality. What Thorstein Veblen called "conspicuous consumption" is the purchase of goods that do not exhibit additional utility or functionality but offer status and reveal socio-economic position (Veblen 1899). Drawing from Veblen, some of the earlier work in this area focused on the role of price in influencing consumers. The phenomenon that Leibenstein (1950) and Bagwell and Bernheim (1996) termed "Veblen effects" suggests that increased price reveals luxury and encourages conspicuous consumption. The larger body of research on conspicuous consumption argues that while, as a general rule, rich households spend more on these socially visible goods than poor households, other variables also influence status spending. For example, Charles et al. (2009) find that,

controlling for income levels, blacks and Hispanics spend more than whites on conspicuous consumption and argue that this pattern is explained by relatively lower income among racial minorities. The utility from spending more on conspicuous goods depends on with whom people compare themselves. For example, Heffetz (2011, 2012) shows that the demands for conspicuous goods are coming from visibility of items and how the visibility differs across demographic groups. Heffetz argues that wealthier people gain greater utility out of conspicuous consumption due to the greater number of socially visible milieus in which they are able to display these items. As one important aspect of status consumption is revealing one's economic position vis-à-vis others, the role of negative peer effects has also been explored (Rayo and Becker 2007; Luttmer 2005; Bertrand and Morse 2016). Being friends with or in close geographic proximity to wealthier households both increases spending and financial duress and decreases happiness (Easterlin 2007; Kahneman and Deaton 2010).

While much work studying consumer behavior considers the expense of goods as a proxy for conspicuous consumption, there is an important line of research that studies the more nebulous, "inconspicuous" aspects of status. Bourdieu's (1984) study of taste and the role of what he called "habitus", suggests that many markers of status are contextual construed and rely on information more so than simply price or materiality. In Bourdieu's analysis, much of status is derived from prosaic activities and consumption habits embedded into daily life not simply expensive material objects. Lamont's (1992) study of "symbolic capital" expands this idea, where she argues that norms and practices create boundaries across income and social groups (What Khan and Jerolmack (2013) call a "learned form of capital"). These boundaries are often cultural and vis-à-vis one's peer group rather than for the purposes of revealing status to a wider population. Holt (1998) takes Bourdieu's framework and applies it to the United States,

concluding that consumer behavior and class do not always adhere to Veblen effects, but rather we make consumer decisions that rely on socio-economically exclusive information. While this literature does not use the term "inconspicuous" specifically, the analyses suggests that status is not always about conspicuous consumption, but rather it can take immaterial forms and rely on tacit social knowledge.

The geography of consumer behavior and its implications has been studied through the framework of the "consumer city" (Glaeser et al. 2001). From this perspective, the supply of certain goods and services can play an important role in attracting and retaining certain group of people as they will ultimately move to community that can maximize their personal utility (Tiebout 1956, Hirschman 1970). Indeed, Glaeser et al.'s (2001) pioneering work finds that metros with greater bundles of consumer amenities are more productive and attract greater stocks of high human capital. Also through a geographic lens, Clark (2004) looks at how different bundles of amenities, which he calls "scenes" within a "consumer city", draw different types of human capital and labor pools. Handbury (2012) and Handbury and Weinstein (2015) take this line of inquiry into a more detailed study of particular consumer items. They find that luxury goods are cheaper in urban areas, suggesting economies of scale for affluent populations, while the bigger cities provide the greater product availability as well. Others have considered the standardization of the luxury consumer experience across metro areas (Crewe and Lowe 1995; Wrigley and Lowe 1996). Diamond (2016) argues that urban "hidden amenities" such as public space and human capital, rather than material goods, drive increases in city real estate prices. More broadly, Zukin (1989, 1995, 1998, 2008) has studied the role of culture as a commodity in shaping cities and their identities, particularly looking at how consumerism creates "authenticity" and fuels gentrification processes. The trickle-down consumption, or expenditure cascades,

describes how consumption patterns of elites may influence consumption behaviors of middle income families. This type of behavior is particularly pronounced in conspicuous goods consumption, which reshapes community identification (Bertrand and Morse 2016; De Giorgi et al., 2016; Charles and Lundy 2013; Frank et al. 2014). Recent work suggests that conspicuous consumption affects real estate prices, which will ultimately influence mobility and distribution of workers (Zahirovic-Herbert and Chatterjee 2011; Lee and Mori 2015). Currid-Halkett (2014) finds that metro areas engage in significantly different consumer behavior, particularly around status goods and argues that these differences help explain distinctions in urban identity.

More generally, however, our understanding of the observed differences in consumer behavior across cities and regions and their implications is an understudied area of research in economic geography. While there is an emerging line of inquiry studying the relationship between consumption and geography there is limited if any work done on the relationship between status consumption and geography. Given that the "value" of conspicuous consumption is derived significantly from the physical and social contexts in which it is consumed, it is significant to explore these interactions within the urban milieu and the possible geographical variations of the phenomenon. In this paper we seek to unpack the geographic variations of consumer behavior across metros and how this may inform our understanding of urban differences and economic development. We study these relationships looking at both conventional and status goods, and seek to understand the interaction between consumer behavior and economic geography. What discrete variables might explain differences in consumerism across metro areas? How might our understanding of these dynamics illuminate our understanding of cities and their differences more generally?

III. Method and Data

To understand how consumption is associated within surrounding urban context in which an individual household is located, we estimate both metropolitan fixed-effects and random-effects models that include metropolitan level characteristics as regressors. The fixed-effects models enable us to control for time invariant characteristics of metropolitan areas and to highlight which metropolitan areas have higher or lower levels of unexplained consumption. We highlight how spending patterns differ across cities, even after controlling for demographic and socio-economic characteristics of individual households. The random-effects models enable us to examine how and what natural and urban amenities are associated with the consumption patterns across cities, while controlling for unobserved random effects.

The metropolitan fixed-effects model is of the form:

$$y_{ijk} = \boldsymbol{\beta X_{ijk}} + \alpha_j + \tau_t + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is the log of consumption of a household *i* in a metropolitan area *j* in a year *t*. The models are estimated for three dependent variables: conspicuous consumption, inconspicuous consumption, and other expenditures. $\boldsymbol{X_{ijt}}$ is a vector of demographic and socio-economic characteristics of a household *i* in a metropolitan area *j* in a year *t*, α_j is a time-invariant city fixed effect, and $\boldsymbol{\tau_t}$ is a year fixed effect. The city fixed-effects are of particular interest as they absorb any systemic differences in consumption patterns across cities, holding other factors constant. We estimate models separately for conspicuous consumption, inconspicuous consumption, and other spending to determine how much city differences account for differences in each category of consumption. The sampling weights are used in the regression to account for sampling design, and robust standard errors are used to correct for heteroscedasticity.

Although the fixed-effects model enables us to determine to what extent spending patterns differ across metropolitan areas, we cannot infer what explains such differences across metropolitan areas from the model. To explore what explains the geographic variations of consumer behavior, we estimate random-effects models that include metropolitan area-level urban characteristics as well as household-level individual attributes:

$$y_{ijt} = \boldsymbol{X_{ijt}\beta} + \boldsymbol{N_{jt}\gamma} + \tau_t + \zeta_j + \epsilon_{ijt} \quad (2)$$

where $\boldsymbol{N_{jt}}$ is a vector of metropolitan area characteristics of city *j* in year *t*. The random intercept ζ_j represents unobserved heterogeneity at the metropolitan area level. All other individual household level variables are the same as before. Here, we assume that the random intercept is uncorrelated with independent variables.[1]

The primary source of data used in this study is the 2007–2013 Consumer Expenditure Survey (CE) from the Bureau of Labor Statistics (BLS), a quarterly survey of the consumer habits of Americans categorized by age, race, marital status, income, and educational attainment, among other variables. The data set contains the most comprehensive and reliable source of information on consumption expenditures (Li et al. 2010; Bee et al. 2015) and has long been used in studying consumers and their buying behaviors in the United States (Charles et al. 2009; Heffetz 2011; Charles and Lundy 2013). The Consumer Expenditure Survey Interview Public-Use Microdata (PUMD) provides individual consumer unit-level consumption behaviors with hundreds of standardized expenditure item codes (referred to as the Universal Classified Codes,

[1] The Breusch-Pagan's Lagrange multiplier test strongly rejects the null hypothesis of a zero metropolitan area level variance and favors the fixed- or random-effects model over ordinary least squares (OLS) analysis. While the Hausman test statistics favors the fixed-effects model over the random effects model, the random effects model allows for testing the impact of metropolitan level characteristics directly.

UCC), and its detailed information on households enable us to analyze consumption expenditures across cities while controlling for household characteristics, including geographic, demographic, and socio-economic status.[2] Annualized expenditures are adjusted for inflation to 2015 dollars.

The dependent variables in this study are specified as the log of the amount of money spent on conspicuous consumption, inconspicuous consumption, and other spending.[3] We characterize luxury goods as conspicuousness and inconspicuousness based on designations in past literature (Bourdieu 1984; Lamont 1992; Charles et al. 2009; Heffetz 2011, 2012; Bagwell and Bernheim 1996). While conspicuous consumption is a well-established term in the literature, we also study the relationships between inconspicuous consumption and demographic and geographic variables. Using the UCC items, we apply the conventional definition for conspicuous goods as those luxury goods that are visible and portable. We categorize luxury goods that are immaterial and not directly visible as inconspicuous. Other expenditures are defined as total expenditures less conspicuous and inconspicuous consumption. The resulting consumption categories are shown in Table 1.

[insert Table 1 about here]

To test the robustness of the results, we define conspicuous consumption based on the "visibility" index developed by Heffetz (2011).[4] Heffetz (2011) measured visibility of 31

[2] In this paper, the terms consumer unit, family, and household are used interchangeably.
[3] The log terms were used to accounts for skewness in expenditures. Alternative specifications of the dependent variable did not alter the primary findings in the study.
[4] Heffetz (2011)'s survey and visibility index are based on the consumption categorization that was proposed by Harris and Sabelhaus (2005). To be consistent with Heffetz (2011)'s visibility index, we aggregated the consumption data at the UCC code level into the Harris and Sabelhaus (2005)'s consumption categories.

consumption categories through a nationally representative survey of 480 U.S. adults and examined the relationship between the visibility and income elasticities. The proposed index measures how long it would take for respondents to notice others spend more than average on a certain item (1.0 = almost immediately; 0.75 = a short while after; 0.5 = a while after; 0.25 = a long while after; and 0). Based on the visibility index and total expenditure elasticity of each consumption category presented in Heffetz (2011), we classified the items with visibility index of 0.6 or greater and total expenditure elasticity above unity as conspicuous. In the same way, the expenditure categories with visibility index of 0.4 or less and total expenditure elasticity above unity are classified as inconspicuous consumption.[5]

The variables of interest in this paper are the metropolitan characteristics that influence households' consumption behavior. Starting in the second quarter of 2006, the Consumer Expenditure Survey Interview Public-Use Microdata began providing identifiers for 21 major metropolitan areas, referred to as the primary sampling units (PSUs) in the CE, with a population greater than 1.5 million.[6] Using the 21 city identifiers, we are able to study how consumption differs across the major cities in the United States. Also, based on the counties contained in each metropolitan area, we link additional data to determine associations between what cities offer and how it links to what its inhabitants tend to consume.

[5] For example, although tobacco products are the most visible item among the 31 categories, we do not include it to conspicuous consumption category because it is an inferior good. We also tested the robustness of the results by varying the number of items for grouping, and the results were qualitatively unchanged.

[6] The primary sampling units (PSUs) consist of counties (or parts thereof) or groups of counties. The boundaries have been consistent from 2006 to 2014. The list of counties for those PSUs are provided in Table B in the Appendix.

Among the metropolitan characteristics, annual population estimates and population density per square mile are drawn from the Census Bureau's the decennial Census and the National Population Estimates. The dissimilarity index was calculated at census tract level for the metropolitan areas using the 2009–2015 American Community Survey (ACS) 5-Year Estimates. The index measures the degree of residential segregation between households in the top income quintile in each city in each year and others.[7] The median household income by racial/ethnic group are calculated based on the 2007–2013 American Community Survey (ACS) 1-Year Public-Use Microdata Sample (PUMS). Based on the householder's race/ethnicity, we assigned the median income of own racial/ethnic group and the one of other groups to examine the role of reference group income.[8]

The association between urban amenities and consumption, suggested by Glaeser et al. (2001), is examined by using location quotient (LQ) of food service and drinking places industry (NAICS 722). The index was used to represent relative concentration or specialization of restaurants and drinking places of a city based on the 2007–2013 County Business Pattern. Following Glaeser et al. (2001) and Albouy (2008), we use the mean temperature in January and number of days with greater than or equal to 0.1 inch of precipitation to capture natural amenities of metropolitan areas based on the National Climatic Data Center's the Monthly/Annual Climatological Summary data.

[7] We also tested other income thresholds such as top 10% and absolute dollar term ($200,000 in 2015 dollars). The results were consistent across those variables.

[8] Some metropolitan areas have borders that do not align with the Public Use Microdata Area (PUMA), which is the geographic unit used in the PUMS files. In these cases, we used the adjusted weights for the households within those PUMAs using the numbers of housing units as weights. Similar approach can be also found in Albouy and Lue (2015).

Lastly, cost of living differences across cities are addressed by using the 2008–2013 Regional Price Parities (RPPs) provided by the Bureau of Economic Analysis.[9] Because the index is comprised of the data on goods/services and rents, we include two cost of living variables, on goods and rents, in the model. The descriptive statistics of all metropolitan area-level variables used in this study are presented in Table 2.

[insert Table 2 about here]

We also include household-level covariates that have been considered as major determinants of consumption behaviors; namely, age, sex, race/ethnicity, marital status, and occupation of reference person, family size, whether having a child or children, log of current family income (in 2015 dollars), log of total expenditure, log of financial wealth, the highest education between reference person and his/her spouse, number of earners in household, units in structure, and housing tenure status.

IV. Results

a. Descriptive statistics

Table 3 presents descriptive statistics on income and expenditures for the sample of consumer households from 2007 to 2013 by 21 cities, or primary sampling units. As is evident in Table 3, there are substantial differences in income and consumption across the metropolitan

[9] The Regional Price Parities (RPPs) were used as a cost-of-living index rather than the Consumer Price Index, since the latter one cannot be used for comparison among the areas. The time periods not covered by the RPPs were estimated by using the percentage changes in the CPI-U index in each metropolitan area since the CPI measures how much prices change over time in an individual metropolitan area.

areas. For example, on average, residents in Washington, D.C. spent the most on conspicuous goods ($13,056 in 2015 dollars); the lowest average conspicuous consumption could be found among the New Yorkers ($7,152 in 2015 dollars). These differences may simply reflect the levels of income and total expenditures in a metropolitan area. In contrast to the substantial gap in average expenditure on conspicuous consumption, the share of total expenditure spent on conspicuous consumption by residents in New Yorkers was 11.9 percent of total expenditures on all goods, and residents in Washington allocate 13.0 percent of their total expenditures to conspicuous consumption. The greatest share of conspicuous consumption is among residents of Phoenix, who spend about 15.4 percent; the lowest share is among residents of New York City at 11.9 percent. The highest inconspicuous consumption was again reported in Washington, D.C. ($11,108 in 2015 dollars); the lowest was found in Miami ($4,254 in 2015 dollars). As the share of total expenditures, residents in Seattle reported the highest inconspicuous consumption share (12.4%), while residents in Miami had the lowest share (6.7%). The share of expenditures spent on other items ranges from 73.9 percent (Seattle) to 81.1 percent (Miami).

[insert Table 3 about here]

Notably, the cities with lower housing costs tend to have a larger share of conspicuous consumption. For example, the top 5 metropolitan areas by conspicuous consumption share are Phoenix (15.4%), Dallas (14.9%), Detroit (14.7%), Houston (14.6%), and Chicago (14.0%), where have relatively lower housing costs, which might suggest the ability to spend a larger share of household income on luxury items. However, the same relationship does not apply with the consumption of non-visible luxury goods. The top 5 cities ranked by the inconspicuous consumption share is Seattle (12.4), Minneapolis (12.0), Washington, D.C. (11.9%), Connecticut

cities (11.2%), and Boston (11.1%), which includes metropolitan areas that have high housing costs.

On the other hand, the variation in conspicuous and inconspicuous consumption might be partially explained by the characteristics of residents, such as age and educational attainment. For example, the metropolitan areas with younger heads of household (e.g. Phoenix, Houston, and Dallas) tend to spend more money on conspicuous goods compared to those cities with more seniors (e.g. Cleveland, Connecticut cities, and Philadelphia). The cities with relatively well educated people (e.g. Washington D.C., Baltimore, and San Francisco) tend to have lower share of expenditures on conspicuous goods, and cities with opposite characteristics (e.g. Dallas, Houston, and Phoenix) tend to have the higher share. In the analysis below, we estimate models to determine what characteristics are associated with the level of consumption.

b. Individual determinants of consumption

We first present the impacts of individual determinants of conspicuous consumption across three models in Table 4. Model 1 contains no fixed effects or random effects. Model 2 contains the metropolitan fixed effects, and model 3 contains the metropolitan level characteristics and random effects. Table 5 presents the same models with inconspicuous consumption as the dependent variable.

[insert Table 4 and 5 about here]

Most results on the determinant of individual household characteristics conform with expectations and what has been found in previous studies. The amount of money spent on

conspicuous consumption, which consists of many durable goods, tends to decrease with age, while that on inconspicuous consumption, which includes housekeeping and healthcare services, exhibits a U-shaped curve, suggesting the impacts of age. On average, Hispanic households spend 9.2 percentage more money on conspicuous goods and services, while other racial/ethnic groups are not statistically different from non-Hispanic Whites. However, racial/ethnic minority groups spend less money on inconspicuous consumption, ranging from 5.7 percent (African American) to 16.9% (Hispanic). These difference in consumption between groups might be at least partially explained by the differences in preferences and in status-seeking behavior (Heffetz 2012; Charles et al. 2009).

The relationship between education and the consumption of both conspicuous and inconspicuous consumption is consistent with other literature on conspicuous consumption (Currid-Halkett 2017). Invisible luxury goods (Table 5) are much more likely to be consumed by those with high levels of education. At the same time, levels of conspicuous consumption (Table 4) decline with education. This suggests that education may alter decisions of households to save more for retirement or purchase more insurance, which do not reveal their social status (Currid-Halkett 2017), but that have long term impacts.

Finally, we note that both the coefficient on total expenditures in both Table 4 and Table 5 are above unity. This estimated elasticity is consistent with the conclusion that both conspicuous and inconspicuous goods are luxurious ones.

c. Metropolitan Fixed Effects

Despite the large set of household-level controls and year fixed effects, the city where people are living in remains a strong predictor for explaining conspicuous consumption (Table 6). For example, Bostonians on average spend 15.6 percent less on conspicuous goods compared to their counterparts in Chicago, controlling for other covariates. The cities that have the greatest unexplained effect on conspicuous consumption are Detroit, Dallas, and Cleveland, and the metropolitan areas with the smallest effect are Boston, Washington, D.C., and San Francisco. The gap (31 percent) between the city with the highest unexplained consumption (Detroit) and the lowest (Boston) is quite substantial. The gap in conspicuous consumption across cities becomes even more dramatic when it is compared to the gap in inconspicuous consumption. The magnitudes of estimated coefficients across cities for inconspicuous consumption are typically smaller than those for conspicuous consumption.[10] The places with the greatest fixed-effects on inconspicuous consumption are Seattle, Minneapolis, and Phoenix, while the least fixed-effects are found in New Jersey cities, Miami, and San Diego.

[insert Table 6 about here]

In sum, the results of the household-level analysis indicate that consumption does differ across cities, accounting for individual household characteristics, and that these differences among cities are larger for conspicuous consumption. The latter part can be explained by the fact that the value and meaning of conspicuous goods are created and determined within a social

[10] Additional statistics also support this finding. For example, the estimate of the between-subject standard deviation, measuring variances between cities, from the conspicuous consumption model is 0.093, while that from the non-conspicuous consumption model is 0.087. The interclass correlation, which indicates how much variances in overall consumption are explained by between-city component, from the conspicuous consumption is 0.0129, while that from the non-conspicuous consumption is 0.007.

context and the interactions that occur *in situ*. These results suggest that conspicuous consumption is an inherently *urban* feature (Veblen 1899; Simmel 1903). The less dramatic results for inconspicuous consumption is a corollary to this result: inconspicuous consumption has less visible impact and the motivations for spending may be less oriented around social positioning than quality of life (Currid-Halkett 2017; Chetty et al. 2017). Thus, the particular social and urban context may matter less for inconspicuous consumption. In the next section, we examine how the much of the unexplained variation across cities in conspicuous consumption can be explained by the urban context and variables within.

d. Random-Effects Models

To determine which metropolitan characteristics are correlated with consumption patterns, we estimate the random-effects models with controls for various city attributes. In the model, we include four types of metropolitan characteristics that may influence consumer behavior based on previous research: urban size and population density (Handbury 2012; Handbury and Weinstein 2015; Diamond 2016; Simmel 1903), socio-economic metropolitan area characteristics (Charles et al. 2009; Charles and Lundy 2013), urban amenities (Glaeser et al. 2001; Clark 2004; Florida 2002), and natural amenities (Glaeser et al. 2001; Albouy 2008).

The results of the random-effects models are shown in Table 7. The first column in Table 7 indicates that city size (population) and population density are positively associated with conspicuous consumption. This result corroborates Glaeser and Gottlieb (2006) who find that consumer options are strongly associated with urban density. As Simmel (1903) noted more than a hundred years ago, greater anonymity in the bigger and denser cities may paradoxically

heighten the need to accentuate individual differences. Economies of scale might enable those bigger cities to provide more diverse conspicuous goods and services at cheaper prices, which make not only top earners but also middle class spend more money on those items (Handbury 2012; Handbury and Weinstein 2015; Bertrand and Morse 2016; Di Giorgi et al. 2016; Frank et al. 2014).

[insert Table 7 about here]

Holding other covariates constant, including city size and population density, income and population distributions within a city are also strong predictors of conspicuous consumption. There is a negative relationship between income inequality, measured by the Gini coefficient, and conspicuous consumption. Using slightly different methods and data, Charles and Lundy (2013) found a similar negative association between income inequality and visible goods (e.g. vehicles and jewelry). The same authors found a positive association between income inequality and expenditures on food and shelter, which they explain by noting that households in high-inequality metropolitan areas (e.g. New York, Miami, and Los Angeles) have to allocate more money on necessary goods (food and shelter) and thus less on conspicuous goods, compared to the families in low-inequality areas (e.g. Minneapolis, Phoenix., and Riverside). On the other hand, residential segregation, measured by the dissimilarity index, is positively related to conspicuous consumption. The more income-segregated cities (e.g. Houston, Dallas, and Los Angeles) may have stronger notions of social class, which may influence their residents to spend more money on status goods as a positioning device than people in relatively less income-segregated cities (e.g. Baltimore, Minneapolis, and Seattle).

The coefficients on median income of own race/ethnic group within a metropolitan area and median income of others groups are consistent with the theories of status-signaling and conspicuous consumption suggested by Charles et al. (2009). In this paper, the authors argue that people may have different incentives to spend money on conspicuous goods as individuals belong to different group. For example, racial/ethnic minority persons may have greater needs to buy status goods to distinguish themselves from their economically disadvantaged group. Our results confirm this story: Conspicuous consumption is positively associated with the median income of own racial/ethnic group within the same metropolitan area but not with the median income of other groups.

Not all urban characteristics are related to conspicuous consumption. Although the relative specialization of restaurants and bars are positively associated with conspicuous consumption, natural amenities such as average temperature in January and number of rainy days are not related with consumption patterns. The cost of housing is found to be negatively correlated with conspicuous consumption, which is likely due to households possessing less discretionary income.

While there are many associations between conspicuous consumption and metropolitan area characteristics, there are only few urban characteristics that are related to inconspicuous consumption (city size and median income of own race/ethnic group) and other consumption (income inequality and median income of own race/ethnic group). Metropolitan characteristics are most likely to predict conspicuous, status-driven consumption. Our analysis suggests that the differences across consumption types in those relationships indicate that a specific urban context in important with regard to socially visible status consumption.

V. Additional tests

We conduct three additional tests to explore the robustness of the results. First, we use the Heffetz (2011)'s visibility index and total expenditure elasticity to determine conspicuous and inconspicuous consumption.[11] Table 8 compares estimated coefficients for the models based on our categories and the ones based on the Heffetz (2011). In both fixed-effects model and random-effects model, the estimated coefficients have strikingly similar magnitudes and statistical significances. For example, when we plot the estimated coefficients for the fixed-effects regression models of conspicuous and inconspicuous consumption, the r-squared was 0.827 and 0.718, respectively. For the random-effects model, the magnitudes of estimated coefficients are quite similar, while the models based on our own consumption categories tend to show stronger statistical significances. These give us more confidence in our measure of conspicuousness and inconspicuousness.

[insert Table 8 about here]

Second, there might be another concern on that large cities such as New York and Los Angeles could disproportionately impact the results. Because these cities have some unique urban characteristics, such as significantly larger city size and population density, some might be concerned that the results are mainly driven by these big cities, and thus the findings are not generalizable to many other cities. In Table 9, the models are estimated without New York and Los Angeles. The differences in estimated coefficients are not large.

The final issue is that our measures of consumption contain many categories with zero consumption. To account for left censorship at zero, we estimate Tobit models and display

[11] Heffetz (2011)'s visibility index and consumption categories are shown in Table A in Appendix.

marginal effects in Table 9. There are some changes in magnitudes and statistical significance of coefficients, but the overall patterns are similar.

[insert Table 9 about here]

VI. Conclusion

In this study, we unbundled the relationship between consumption and the metropolitan context in which a household resides. We do this by using the Bureau of Labor Statistics' Consumer Expenditure Survey (CEX) to estimate first how individual consumption patterns vary across 21 major metropolitan areas. To our knowledge, the CEX has not until now been used to study city consumption patterns. Equally, our approach is innovative in its granular specificity to the study of consumption in both the analysis of between-cities consumption and the particular consumption habits associated with these differences. To our knowledge, this is the first study that empirically measures the geographical differences in consumption across an array of different types of consumption, and quantifies the variables that might explain these distinctions.

We find that there are discrete differences in consumer behavior in the three forms of consumption we study: inconspicuous consumption, conspicuous consumption and general expenditures. However, the most interesting story is that of conspicuous consumption. We find that metropolitan area strongly influences such spending, but has little effect on the other categories of consumption. Our work quantifies and articulates the role of conspicuous consumption and social positioning in cities and the variables that influence this type of spending.

To understand this result, we then used the unexplained variation within metropolitan areas to determine how urban context might explain differences in urban consumer behavior. By studying the association between specific urban consumption patterns and city characteristics we address the "why" in previous literature on consumption and cities (Glaeser et al. 2001; Handbury 2012). Through this approach, we were able to identify both the geographical variations in consumption and also the attributes that might help explain these unique patterns. We find that the city and its unique characteristics influence how its denizens conspicuously consume.

Our analysis goes beyond simply looking at individual household characteristics. We study the qualities of the urban milieu itself and its characteristics. While our analysis indicates differences in consumption behavior across different types of spending, most significantly, we find that conspicuous consumption is influenced by the urban context and specific variables within. Our results indicate that while consumer behavior varies across metropolitan areas, the differences in spending on conspicuous consumption are the largest. The metropolitan level analysis reveals that the variance in conspicuous consumption across cities is closely associated with a number of discrete variables: population size and density, age structure, share of top earners, urban amenities, and cost of living of those cities. Our work addresses and confirms a line of inquiry theorized in many of the early 20th century theories of the city and its features of density, anonymity, eccentricity and need for denizens to differentiate themselves (Veblen 1899; Simmel 1903; Mills 1956; Park et al. 1925; Molotch 1996, 2002).

Like many other social and economic phenomena, much of what we understand about consumption manifests in geography. In short, people consume goods in particular places. With this fact in mind, how then might place inform consumption and vice versa? To that end, an

emerging, but limited, line of research in geography looks at how and what we consume reveals important differences across cities and regions. This work corresponds to the larger body of research on the study of the attributes and amenities that comprise place and what those differences across metros might mean (Glaeser and Saiz 2004; Romer 1986; Bell 1973, among others). While our work gets closer to the specific differences in consumer habits, we have yet to explore what these differences might mean for economic development or human capital mobility. For example, Diamond (2016) finds that between 1980 and 2000, the population of college-educated New Yorkers increased by almost three-quarters while simultaneously the population of non-college educated decreased by 15%. Diamond's finding corresponds to a general trend across the country in metro areas with high concentrations of high human capital where the uptick in the educated is rapid and parallels with an erosion of lower skilled workers.

The extant literature suggests that consumption plays an important role in economic development through amenities, retail and the transformation of culture into a commodity. These processes are thought to be at least partially responsible for how cities attract skilled labor pools (Florida 2002). For example, Diamond (2016) finds that these luxury cities with high human capital offer "hidden amenities", one of which is the desire for educated human capital to be located near each other. Our understanding of the role of consumption thus far has been relegated to specific qualitative case studies (particularly of New York City) and quantitative analysis that offers broad generalizations around amenities and human capital. In short, the variables underpinning this relationship have not been fully explored in comparative detail across a wide scale of metro areas. While amenities are thought to explain human capital mobility, our work indicates that cities offer significantly different amenities from one another, which suggests perhaps different motivations for human capital mobility. In our research, the causal direction is

not yet evident but one worth unpacking in future work. Do we shape consumer options (i.e. does the urban market respond to its denizens) or do they shape us? Do we self-select into particular types of cities with specific amenities or urban context or do we respond to what is already on offer? These are important questions that may help us understand the role of consumerism in shaping urbanity and, conversely, urbanity's role in shaping our consumption and how these interactions shape social and economic behavior.

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Table 1. List of conspicuous and inconspicuous consumption items

Consumption categories and UCC codes
Conspicuous Consumption
Food
Meals at restaurants, carry-outs and other (790410)
Alcoholic beverages
Alcoholic beverages at restaurants, taverns (790420)
Housing
Cellular phone and service (270102), Household textiles (280110-280900), Sofas (290210), Living room chairs (290310), Living room tables (290320), Kitchen, dining room furniture (290410), Infants' furniture (290420), Outdoor furniture (290430), Floor coverings, nonpermanent (320111), Cooking stoves, ovens (300311, 300312), Flatware (320330), Dinnerware, glassware, serving pieces (320345), Window coverings (320120), Infants' equipment (320130), Outdoor equipment (320150), Lamps, lighting fixtures, ceiling fans (320221), Clocks and other household decorative items (320233), Office furniture for home use (320901), Indoor plants, fresh flowers (320903), Luggage (430130)
Apparel and services
Men and boys (360110-370904), Women and girls (380110-390902), Children under 2 (410110-410901), Footwear (400110-400310), Watches (430110), Jewelry (430120)
Transportation
New cars (450110), New trucks (450210), New motorcycles (450220), Car/truck lease payments (450350)
Entertainment
Televisions (310140), Personal digital audio players (310314), Stereos, radios, speakers, and sound components (310316), Boat without motor and boat trailers (600121), Purchase of boat with motor (600132)
Personal care products and services
Wigs and hairpieces (640130)
Inconspicuous Consumption
Alcoholic beverages
Beer and wine (790310), Other alcoholic beverages (790320), Beer, wine, other alcohol (790330)
Housing
Property management (230901, 230902), Management and upkeep services for security (340911, 340912), Babysitting and child care (340211, 340212), Care for elderly, invalids, handicapped, etc. (340906), Adult day care centers (340910), Day care centers, nursery, and preschools (670310), Housekeeping services (340310), Gardening, lawn care service (340410), Household laundry and dry cleaning, sent out (340520), Home security system service fee (340915), Lodging on out-of-town trips (210210), Mattress and springs (290110)
Apparel
Shoe repair and other shoe service (440110), Alteration, repair and tailoring of apparel (440130), Watch and jewelry repair (440150), Apparel laundry and dry cleaning not coin-operated (440210)
Transportation

Airline fares (530110), Taxi fares and limousine services on trips (530411, 530412), Ship fares (530901), Automobile service clubs (620113)

Healthcare

Physician's services (560110), Dental services (560210), Eyecare services (560310)

Entertainment

Recreation expenses, out-of-town trips (610900), Social, recreation, health club membership (620111), Fees for participant sports (620121), Participant sports, out-of-town trips (620122), Movie, theater, amusement parks, and other (620211, 620212), Play, theater, opera, concert (620213), Movies, parks, museums (620214), Admission to sporting events (620221), Admission to sports events, out-of-town trips (620222), Fees for recreational lessons (620310), Other entertainment services, out-of-town trips (620903), Musical instruments and accessories (610130), Rental and repair of musical instruments (620904), Rental of video cassettes, tapes, films, and discs (620912), Pet purchase, supplies, medicine (610320), Pet services (620410), Vet services (620420), Toys, games, arts and crafts, and tricycles (610110), Stamp and coin collecting (610140), Playground equipment (610120), Rental non-camper trailer (520904), Rental of boat (520907, 620906), Rental of motorized camper (620909, 620921), Rental of other RV's (620919, 620922), Docking and landing fees (520901), Athletic gear, game tables, and exercise equipment (600210), Bicycles (600310), Camping equipment (600410), Hunting and fishing equipment (600420), Winter sports equipment (600430), Water sports equipment (600901), Other sports equipment (600902), Rental and repair of miscellaneous sports equipment (620908), Film (610210), Photo processing (620330), Repair and rental of photographic equipment (620905), Photographic equipment (610230), Photographer fees (620320), Live entertainment for catered affairs (680310),

Rental of party supplies for catered affairs (680320),

Personal care products and services

Personal care services (650310)

Reading

Newspaper, magazine by subscription (590310, 590410), Books (590220, 590230), Encyclopedia and other sets of reference books (660310)

Education

College tuition (670110), Elementary and high school tuition (670210)

Miscellaneous

Legal fees (680110), Accounting fees (680902), Dating services (680904), Vacation clubs (680905), Credit card memberships (620112), Shopping club membership fees (620115)

Cash contributions

Cash contributions to charities and other organizations (800821), Cash contributions to church, religious organizations (800831), Cash contribution to educational institutions (800841), Cash contribution to political organizations (800851)

Note: Among the UCC codes for apparel and services, uniforms were excluded (e.g. men's uniforms (360901), boy's uniforms (370903), women's uniforms (380902), and girl's uniforms (390901)).

Table 2. Mean values for metropolitan level variables, by primary sampling units (MSAs)

	Pop. (in 000s)	Pop. Density	Median Household Income				
			White	Black	Asian & PI	Hispanic	Other
Atlanta	5,237	693.7	64,684	42,464	67,586	40,154	50,142
Baltimore	2,096	831.7	79,522	46,617	85,371	60,535	55,515
Boston	7,404	739.7	71,561	44,871	78,326	35,732	51,012
Chicago	9,534	1,303.5	71,828	36,708	79,833	49,354	52,135
Cleveland	2,880	800.2	55,176	28,051	68,472	36,860	37,291
CT cities	8,042	1,101.2	86,823	55,105	103,071	53,209	64,385
Dallas	6,532	639.0	67,729	39,671	74,579	41,800	50,628
Detroit	5,338	817.5	58,804	32,197	79,509	41,960	41,104
Houston	5,966	675.8	74,551	40,064	76,321	43,317	53,711
Los Angeles	12,877	2,655.9	78,647	43,470	70,646	48,535	63,340
Miami	4,292	1,381.1	61,821	39,134	69,007	43,632	52,820
Minneapolis	3,481	447.6	66,858	29,537	67,342	44,523	45,288
NJ cities	6,953	1,583.9	83,859	48,515	108,876	51,502	63,925
New York	8,214	27,140.4	75,149	43,305	56,752	36,898	56,186
Philadelphia	6,493	1,101.9	72,058	38,629	71,587	38,557	50,337
Phoenix	4,211	289.1	60,742	42,165	70,498	41,438	42,758
Riverside	5,054	173.7	65,842	51,519	79,832	51,804	56,896
Seattle	4,036	560.8	68,507	43,690	72,442	46,622	54,811
San Diego	3,102	737.3	73,655	50,020	82,027	46,920	62,836
San Francisco	3,102	737.3	87,015	46,987	95,009	55,377	70,526
Washington, DC	5,893	863.7	93,006	64,294	101,814	66,227	80,631

	Gini Coef.	Dissimilarity Index	Restaurants & bars LQ	Temp. in Jan (°F)	No. of rainy days	Regional Price Parities	
						Goods	Rents
Atlanta	0.46	0.36	1.05	44.3	106.4	106.4	97.9
Baltimore	0.44	0.33	1.05	34.5	118.9	118.9	100.7
Boston	0.46	0.34	0.92	30.5	126.9	126.9	98.4
Chicago	0.46	0.37	0.93	25.0	132.6	132.6	103.7
Cleveland	0.45	0.37	0.96	27.7	159.1	159.1	93.7
CT cities	0.47	0.35	0.83	29.3	128.7	128.7	97.7
Dallas	0.46	0.41	1.02	46.7	82.7	82.7	97.9
Detroit	0.45	0.38	1.02	26.0	135.3	135.3	98.7
Houston	0.47	0.42	1.01	53.0	92.9	92.9	97.7
Los Angeles	0.48	0.39	0.98	58.7	33.4	33.4	102.9
Miami	0.49	0.39	1.05	69.0	139.3	139.3	99.2
Minneapolis	0.43	0.33	0.88	15.2	114.0	114.0	100.6
NJ cities	0.46	0.39	0.74	33.6	122.9	122.9	99.9
New York	0.53	0.39	0.81	33.8	126.1	126.1	107.5
Philadelphia	0.46	0.38	0.85	34.8	123.1	123.1	103.4
Phoenix	0.44	0.39	1.05	53.9	33.7	33.7	100.4
Riverside	0.44	0.37	1.19	55.7	30.7	30.7	98.9
Seattle	0.44	0.32	0.96	41.1	164.6	164.6	105.3
San Diego	0.45	0.36	1.12	57.2	37.0	37.0	103.4
San Francisco	0.45	0.36	1.12	57.2	37.0	37.0	103.4
Washington, DC	0.44	0.37	0.94	37.5	115.9	115.9	106.1

Note: All figures are inflation adjusted to 2015 dollars. The location quotients are computed for "Food Services and Drinking Places (NAICS 722)." The values are averages from 2007 to 2013.

Table 3. Descriptive statistics on income and consumption by primary sampling units (MSAs)

	Family	Total	Amount of Dollars Spent on			% of Total Expenditures		
	Income	Spending	Cons	Incons	Other	Cons	Incons	Other
All 21 PSUs	77,172	60,923	10,315	8,156	42,452	13.2	10.1	76.7
	(83,442)	(53,839)	(23,851)	(19,991)	(29,734)	(12.6)	(10.9)	(16.2)
Atlanta	73,785	53,308	9,514	6,588	37,206	13.9	9.2	76.9
	(73,404)	(41,481)	(20,692)	(12,921)	(22,399)	(12.4)	(10.2)	(15.4)
Baltimore	92,673	60,506	9,051	8,065	43,391	12.1	10.1	77.8
	(104,900)	(48,360)	(18,620)	(16,979)	(29,129)	(11.7)	(10.9)	(15.5)
Boston	83,317	64,418	10,834	9,380	44,203	12.6	11.1	76.3
	(90,891)	(61,591)	(32,625)	(21,728)	(29,081)	(12.6)	(11.4)	(16.3)
Chicago	76,536	61,085	10,909	8,506	41,670	14.0	10.5	75.5
	(77,791)	(48,443)	(22,023)	(16,256)	(26,218)	(13.3)	(11.0)	(16.6)
Cleveland	62,977	49,892	8,950	5,821	35,121	13.0	9.1	77.8
	(66,947)	(40,629)	(19,951)	(10,526)	(23,351)	(13.0)	(9.7)	(16.3)
Connecticut	89,874	74,123	12,192	10,956	50,974	12.9	11.2	76.0
Cities	(90,386)	(61,342)	(25,414)	(23,948)	(32,906)	(12.6)	(11.2)	(16.4)
Dallas	71,788	56,686	10,945	6,343	39,398	14.9	9.1	75.9
	(69,413)	(42,508)	(22,685)	(10,072)	(24,505)	(13.4)	(9.2)	(15.6)
Detroit	65,554	53,467	10,346	6,865	36,256	14.7	9.9	75.5
	(73,757)	(42,263)	(21,872)	(12,591)	(22,253)	(13.5)	(10.6)	(16.6)
Houston	74,241	58,382	11,681	7,030	39,671	14.6	9.3	76.1
	(88,361)	(50,958)	(27,451)	(12,696)	(26,393)	(13.6)	(9.3)	(16.1)
Los Angeles	67,264	58,595	9,594	8,291	40,711	13.1	9.8	77.1
	(74,888)	(56,636)	(22,809)	(29,318)	(28,052)	(12.2)	(12.4)	(16.8)
Miami	52,071	47,674	8,205	4,254	35,216	12.3	6.7	81.1
	(55,651)	(53,657)	(25,767)	(12,178)	(30,200)	(12.5)	(8.4)	(15.3)
Minneapolis	75,904	59,278	10,577	8,679	40,023	13.7	12.0	74.3
	(72,753)	(51,450)	(26,059)	(16,904)	(23,952)	(13.3)	(11.6)	(16.9)
New Jersey	91,108	67,491	10,488	8,903	48,099	12.4	9.8	77.8
Cities	(92,901)	(54,963)	(25,762)	(19,200)	(28,363)	(11.6)	(10.5)	(15.3)
New York	59,626	48,706	7,152	6,716	34,838	11.9	8.7	79.4
	(72,707)	(48,659)	(15,855)	(23,181)	(25,030)	(11.1)	(11.4)	(16.3)
Philadelphia	68,496	56,554	9,081	7,594	39,879	12.1	9.4	78.5
	(78,078)	(48,602)	(20,837)	(18,261)	(26,557)	(12.3)	(11.0)	(16.3)
Phoenix	63,015	55,227	11,214	6,379	37,634	15.4	9.9	74.7
	(68,882)	(47,363)	(23,779)	(9,962)	(30,775)	(15.1)	(10.2)	(17.4)
Riverside	67,753	56,597	9,372	5,856	41,370	12.9	8.7	78.4
	(66,966)	(41,564)	(21,402)	(9,849)	(25,991)	(12.4)	(9.3)	(14.9)
Seattle	75,994	68,088	11,545	10,233	46,309	13.7	12.4	73.9
	(65,909)	(65,747)	(23,941)	(33,637)	(40,997)	(12.7)	(11.5)	(16.4)
San Diego	75,516	57,713	8,322	6,716	42,676	12.0	9.2	78.9
	(69,135)	(42,777)	(17,877)	(12,013)	(26,360)	(11.1)	(10.0)	(14.9)
San	75,516	57,713	8,322	6,716	42,676	12.0	9.2	78.9
Francisco	(111,916)	(67,269)	(22,014)	(25,988)	(42,470)	(11.7)	(11.6)	(15.9)
Washington,	112,449	76,523	13,056	11,108	52,359	13.0	11.9	75.2
D.C.	(103,029)	(60,041)	(29,941)	(18,333)	(30,786)	(12.5)	(11.4)	(16.2)

Note: All figures are inflation adjusted to 2015 dollars. The sampling weight variables in the Consumer Expenditure Survey data are used to make the estimates nationally representative. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013.

Table 4. Regression results (Dependent variable: log of conspicuous consumption)

	Model 1		Model 2		Model 3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Age of householder (ref: 15 to 24)						
25 to 34	–0.151	***	–0.157	***	–0.158	***
	(0.016)		(0.016)		(0.029)	
34 to 44	–0.288	***	–0.290	***	–0.293	***
	(0.016)		(0.016)		(0.032)	
45 to 54	–0.386	***	–0.381	***	–0.384	***
	(0.017)		(0.017)		(0.035)	
55 to 64	–0.444	***	–0.433	***	–0.437	***
	(0.018)		(0.018)		(0.035)	
65 to 74	–0.418	***	–0.405	***	–0.408	***
	(0.020)		(0.020)		(0.037)	
75 and over	–0.589	***	–0.570	***	–0.575	***
	(0.024)		(0.024)		(0.046)	
Female householder	–0.022	**	–0.018	**	–0.018	*
	(0.006)		(0.006)		(0.008)	
Race/Ethnicity of householder (ref: Non-Hispanic White)						
African American	0.020		–0.001		–0.107	**
	(0.010)		(0.010)		(0.041)	
Asian and Pacific Islander	–0.019		0.008		0.022	
	(0.012)		(0.012)		(0.029)	
Hispanic	0.093	***	0.092	***	–0.001	
	(0.009)		(0.010)		(0.041)	
Other	–0.045		–0.031		–0.088	
	(0.028)		(0.028)		(0.060)	
Marital status of householder (ref: Married couple)						
Widowed	–0.050	**	–0.045	**	–0.046	*
	(0.017)		(0.017)		(0.019)	
Divorced	0.013		0.014		0.013	
	(0.012)		(0.012)		(0.018)	
Separated	0.016		0.020		0.019	
	(0.021)		(0.021)		(0.027)	
Never married	0.052	***	0.065	***	0.063	***
	(0.012)		(0.012)		(0.017)	
Composition of earners (ref: Single earner)						
No earners	–0.010		–0.013		–0.011	
	(0.015)		(0.015)		(0.020)	
Dual earners	–0.051	*	–0.051	*	–0.051	
	(0.020)		(0.020)		(0.031)	
Other cases	–0.015		–0.015		–0.014	
	(0.017)		(0.016)		(0.024)	
Household size	–0.025	***	–0.026	***	–0.026	***
	(0.003)		(0.003)		(0.006)	
Having a child/children	–0.066	***	–0.063	***	–0.064	***
	(0.010)		(0.009)		(0.013)	
Highest education attainment (ref: High school dropouts)						
High school graduate	–0.031	*	–0.025		–0.026	
	(0.014)		(0.014)		(0.020)	
Some college	–0.004		0.001		0.001	
	(0.013)		(0.013)		(0.019)	
Bachelor's degree	–0.070	***	–0.059	***	–0.058	**

	(0.015)		(0.015)		(0.022)	
Master's degree or higher	–0.146	***	–0.131	***	–0.131	***
	(0.016)		(0.016)		(0.024)	
Occupation (ref: Manager, professional)						
Admin, sales, tech	0.014		0.013		0.013	
	(0.009)		(0.009)		(0.009)	
Service	0.014		0.017		0.015	
	(0.010)		(0.010)		(0.014)	
Operator and assembler	0.002		–0.003		–0.003	
	(0.014)		(0.014)		(0.019)	
Mechanic and mining	–0.051	**	–0.047	**	–0.045	*
	(0.018)		(0.018)		(0.021)	
Farming and fishing	0.033		0.055		0.049	
	(0.038)		(0.038)		(0.069)	
Missing occupation info.	–0.037	**	–0.035	**	–0.038	
	(0.013)		(0.013)		(0.020)	
Units in structure (ref: Single-family housing)						
Multi-family housing	0.033	***	0.049	***	0.051	***
	(0.008)		(0.009)		(0.013)	
Mobile home or other	0.125	***	0.129	***	0.129	***
	(0.017)		(0.017)		(0.022)	
Owner	–0.015		–0.025	**	–0.024	
	(0.009)		(0.009)		(0.017)	
log(income)	–0.010	**	–0.009	**	–0.008	
	(0.003)		(0.003)		(0.004)	
log(wealth)	–0.003		–0.001		–0.001	
	(0.003)		(0.003)		(0.003)	
Missing wealth info.	–0.006		0.004		0.006	
	(0.027)		(0.027)		(0.026)	
log(total expenditures)	1.372	***	1.390	***	1.390	***
	(0.009)		(0.009)		(0.024)	
MSA Fixed-Effects	No		Yes		No	
MSA Characteristics	No		No		Yes	
MSA Random-Effects	No		No		Yes	
Number of observations	75,433		75,433		75,433	
R-Squared	0.5411		0.5464		0.5460	

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded. The robust standard errors are used to correct for heteroscedasticity.

Table 5. Regression results (Dependent variable: log of inconspicuous consumption)

	Model 1		Model 2		Model 3	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Age of householder (ref: 15 to 24)						
25 to 34	–0.234	***	–0.229	***	–0.231	***
	(0.023)		(0.023)		(0.032)	
34 to 44	–0.311	***	–0.301	***	–0.308	***
	(0.024)		(0.024)		(0.039)	
45 to 54	–0.269	***	–0.257	***	–0.262	***
	(0.024)		(0.024)		(0.039)	
55 to 64	–0.227	***	–0.212	***	–0.218	***
	(0.025)		(0.025)		(0.041)	
65 to 74	–0.080	**	–0.062	*	–0.069	
	(0.027)		(0.027)		(0.046)	
75 and over	0.110	***	0.128	***	0.120	
	(0.030)		(0.030)		(0.063)	
Female householder	0.097	***	0.096	***	0.098	***
	(0.008)		(0.008)		(0.012)	
Race/Ethnicity of householder (ref: Non-Hispanic White)						
African American	–0.070	***	–0.057	***	–0.171	**
	(0.014)		(0.014)		(0.065)	
Asian and Pacific Islander	–0.162	***	–0.161	***	–0.153	***
	(0.017)		(0.017)		(0.037)	
Hispanic	–0.184	***	–0.169	***	–0.270	***
	(0.013)		(0.013)		(0.062)	
Other	–0.017		–0.030		–0.084	
	(0.037)		(0.037)		(0.062)	
Marital status of householder (ref: Married couple)						
Widowed	0.069	***	0.076	***	0.072	*
	(0.019)		(0.019)		(0.032)	
Divorced	–0.021		–0.022		–0.023	
	(0.016)		(0.016)		(0.021)	
Separated	0.036		0.034		0.039	
	(0.027)		(0.027)		(0.043)	
Never married	0.061	***	0.063	***	0.060	**
	(0.016)		(0.016)		(0.022)	
Composition of earners (ref: Single earner)						
No earners	–0.168	***	–0.172	***	–0.165	***
	(0.019)		(0.019)		(0.029)	
Dual earners	–0.170	***	–0.175	***	–0.168	***
	(0.025)		(0.025)		(0.035)	
Other cases	–0.279	***	–0.282	***	–0.277	***
	(0.021)		(0.021)		(0.028)	
Household size	–0.069	***	–0.069	***	–0.070	***
	(0.005)		(0.005)		(0.010)	
Having a child/children	0.211	***	0.213	***	0.213	***
	(0.013)		(0.013)		(0.020)	
Highest education attainment (ref: High school dropouts)						
High school graduate	0.136	***	0.150	***	0.142	***
	(0.018)		(0.018)		(0.035)	
Some college	0.323	***	0.328	***	0.322	***
	(0.017)		(0.018)		(0.040)	
Bachelor's degree	0.436	***	0.448	***	0.440	***

	(0.019)		(0.019)		(0.052)	
Master's degree or higher	0.557	***	0.571	***	0.565	***
	(0.020)		(0.020)		(0.049)	
Occupation (ref: Manager, professional)						
Admin, sales, tech	–0.030	*	–0.029	*	–0.031	**
	(0.012)		(0.012)		(0.011)	
Service	–0.107	***	–0.099	***	–0.106	***
	(0.014)		(0.014)		(0.022)	
Operator and assembler	–0.164	***	–0.168	***	–0.171	***
	(0.020)		(0.020)		(0.023)	
Mechanic and mining	–0.111	***	–0.115	***	–0.111	**
	(0.024)		(0.024)		(0.037)	
Farming and fishing	–0.114	*	–0.111	*	–0.115	
	(0.050)		(0.050)		(0.061)	
Missing occupation info.	–0.102	***	–0.099	***	–0.103	***
	(0.016)		(0.016)		(0.024)	
Units in structure (ref: Single-family housing)						
Multi-family housing	0.090	***	0.101	***	0.102	***
	(0.011)		(0.011)		(0.023)	
Mobile home or other	0.072	**	0.067	**	0.071	*
	(0.022)		(0.022)		(0.034)	
Owner	0.301	***	0.305	***	0.302	***
	(0.012)		(0.012)		(0.031)	
log(income)	0.007		0.007		0.008	
	(0.004)		(0.004)		(0.006)	
log(wealth)	0.032	***	0.030	***	0.031	***
	(0.004)		(0.004)		(0.003)	
Missing wealth info.	0.215	***	0.207	***	0.212	***
	(0.034)		(0.034)		(0.034)	
log(total expenditures)	1.473	***	1.477	***	1.477	***
	(0.010)		(0.010)		(0.029)	
MSA Fixed-Effects	No		Yes		No	
MSA Characteristics	No		No		Yes	
MSA Random-Effects	No		No		Yes	
Number of observations	75,433		75,433		75,433	
R-Squared	0.5308		0.5333		0.5319	

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded. The robust standard errors are used to correct for heteroscedasticity.

Table 6. Summarized results of the fixed-effects regressions

Dependent variable:	ln(conspicuous)			ln(inconspicuous)			ln(other)		
	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.
Metropolitan area FEs (ref: Chicago)									
Atlanta	0.042	(0.018)	*	–0.013	0.024		–0.018	0.005	**
Baltimore	–0.106	(0.022)	***	–0.079	0.029	**	0.013	0.006	*
Boston	–0.156	(0.017)	***	0.027	0.020		0.020	0.005	***
Cleveland	0.075	(0.023)	**	–0.048	0.029		–0.022	0.007	**
Connecticut cities	–0.151	(0.016)	***	–0.063	0.020	**	0.050	0.005	***
Dallas	0.102	(0.015)	***	0.037	0.021		–0.012	0.005	*
Detroit	0.113	(0.017)	***	0.007	0.022		–0.027	0.005	***
Houston	0.040	(0.018)	*	0.055	0.023	*	–0.018	0.005	**
Los Angeles	–0.072	(0.014)	***	0.043	0.019	*	0.017	0.004	***
Miami	–0.037	(0.022)		–0.183	0.029	***	0.025	0.006	***
Minneapolis	–0.066	(0.019)	***	0.137	0.024	***	–0.025	0.006	***
New Jersey cities	–0.137	(0.016)	***	–0.192	0.022	***	0.061	0.005	***
New York	–0.053	(0.017)	**	–0.049	0.022	*	0.022	0.005	***
Philadelphia	–0.107	(0.016)	***	–0.070	0.020	**	0.026	0.005	***
Phoenix	0.051	(0.021)	*	0.075	0.027	**	–0.033	0.007	***
Riverside	–0.061	(0.019)	**	–0.028	0.024		0.036	0.005	***
San Diego	–0.141	(0.019)	***	–0.099	0.026	***	0.061	0.006	***
San Francisco	–0.196	(0.016)	***	–0.021	0.020		0.065	0.005	***
Seattle	–0.086	(0.018)	***	0.156	0.023	***	0.014	0.006	*
Washington, DC	–0.156	(0.016)	***	0.015	0.021		0.038	0.005	***
Number of observations		75,433			75,433			75,433	
R-Squared		0.5464			0.5333			0.8485	

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded. The robust standard errors are used to correct for heteroscedasticity.

Table 7. Summarized results of the random-effects regressions

Dependent variable:	ln(conspicuous)			ln(inconspicuous)			ln(other)		
	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.
Metropolitan characteristics									
log(population)	0.043	(0.012)	**	0.101	(0.041)	*	–0.016	(0.009)	
log(population density)	0.052	(0.012)	***	0.020	(0.030)		–0.012	(0.007)	
Gini coefficient (%)	–0.016	(0.005)	**	–0.022	(0.013)		0.006	(0.003)	*
Dissimilarity index (%)	0.010	(0.003)	**	–0.011	(0.009)		–0.000	(0.002)	
log(own race's income)	–0.209	(0.055)	***	–0.213	(0.075)	**	0.050	(0.019)	**
log(others' income)	–0.005	(0.059)		0.004	(0.099)		0.053	(0.032)	
Restaurants and bars LQ	0.407	(0.137)	**	0.176	(0.263)		–0.079	(0.063)	
Avg. temp in Jan (°F)	–0.000	(0.001)		0.000	(0.002)		0.000	(0.000)	
No. of rainy days	–0.000	(0.000)		–0.000	(0.000)		0.000	(0.000)	
RPP (goods)	0.002	(0.003)		0.006	(0.004)		–0.001	(0.001)	
RPP (rents)	–0.002	(0.000)	***	–0.001	(0.001)		0.001	(0.000)	**
Number of observations		75,433			75,433			75,433	
R-Squared		0.5460			0.5319			0.8480	

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded. The robust standard errors are used to correct for heteroscedasticity.

Table 8. Summarized regression results, consumption categories based on Heffetz (2011)'s visibility index and total expenditure elasticity

Dependent variable:	ln(conspicuous)				ln(inconspicuous)			
	Our own		Heffetz (2011)		Our own		Heffetz (2011)	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Fixed-Effects Model								
Metropolitan area FEs (ref: Chicago)								
Atlanta	0.042	*	0.034		–0.013		0.070	**
	(0.018)		(0.022)		(0.024)		(0.026)	
Baltimore	–0.106	***	–0.114	***	–0.079	**	–0.011	
	(0.022)		(0.026)		(0.029)		(0.030)	
Boston	–0.156	***	–0.153	***	0.027		–0.054	*
	(0.017)		(0.019)		(0.020)		(0.021)	
Cleveland	0.075	**	0.070	**	–0.048		–0.008	
	(0.023)		(0.026)		(0.029)		(0.032)	
Connecticut cities	–0.151	***	–0.155	***	–0.063	**	0.001	
	(0.016)		(0.018)		(0.020)		(0.021)	
Dallas	0.102	***	0.094	***	0.037		0.188	***
	(0.015)		(0.018)		(0.021)		(0.023)	
Detroit	0.113	***	0.055	**	0.007		0.087	***
	(0.017)		(0.020)		(0.022)		(0.023)	
Houston	0.040	*	0.009		0.055	*	0.228	***
	(0.018)		(0.021)		(0.023)		(0.025)	
Los Angeles	–0.072	***	–0.079	***	0.043	*	0.025	
	(0.014)		(0.017)		(0.019)		(0.020)	
Miami	–0.037		–0.154	***	–0.183	***	–0.297	***
	(0.022)		(0.028)		(0.029)		(0.032)	
Minneapolis	–0.066	***	–0.009		0.137	***	0.226	***
	(0.019)		(0.022)		(0.024)		(0.025)	
New Jersey cities	–0.137	***	–0.164	***	–0.192	***	–0.157	***
	(0.016)		(0.019)		(0.022)		(0.022)	
New York	–0.053	**	–0.039	*	–0.049	*	–0.036	
	(0.017)		(0.020)		(0.022)		(0.024)	
Philadelphia	–0.107	***	–0.109	***	–0.070	**	–0.059	**
	(0.016)		(0.019)		(0.020)		(0.022)	
Phoenix	0.051	*	0.011		0.075	**	0.093	**
	(0.021)		(0.026)		(0.027)		(0.031)	
Riverside	–0.061	**	–0.045	*	–0.028		0.082	**
	(0.019)		(0.022)		(0.024)		(0.026)	
San Diego	–0.141	***	–0.114	***	–0.099	***	0.014	
	(0.019)		(0.023)		(0.026)		(0.027)	
San Francisco	–0.196	***	–0.153	***	–0.021		–0.050	*
	(0.016)		(0.018)		(0.020)		(0.022)	
Seattle	–0.086	***	–0.034		0.156	***	0.194	***
	(0.018)		(0.021)		(0.023)		(0.025)	
Washington, DC	–0.156	***	–0.146	***	0.015		0.078	**
	(0.016)		(0.019)		(0.021)		(0.023)	
Number of observations	75,433		68,807		75,433		68,807	
R-Squared	0.5464		0.4991		0.5333		0.3835	

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded. The robust standard errors are used to correct for heteroscedasticity.

Table 8. (Continued)

Dependent variable:	ln(conspicuous)				ln(inconspicuous)			
	Our own		Heffetz (2011)		Our own		Heffetz (2011)	
	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.	Coef.	Sig.
Random-Effects Model								
Metropolitan characteristics								
log(population)	0.043	**	0.038	**	0.101	*	0.029	
	(0.012)		(0.014)		(0.041)		(0.059)	
log(population density)	0.052	***	0.039	*	0.020		0.039	
	(0.012)		(0.016)		(0.030)		(0.049)	
Gini coefficient (%)	–0.016	**	–0.013	*	–0.022		–0.024	
	(0.005)		(0.005)		(0.013)		(0.020)	
Dissimilarity Index (%)	0.010	**	0.005		–0.011		0.002	
	(0.003)		(0.005)		(0.009)		(0.013)	
log(own race's median income)	–0.209	***	–0.223	**	–0.213	**	–0.097	
	(0.055)		(0.065)		(0.075)		(0.127)	
Log (other groups' median income)	–0.005		–0.004		0.004		0.141	
	(0.059)		(0.086)		(0.099)		(0.150)	
Restaurants and drinking places LQ	0.407	**	0.354	*	0.176		0.451	
	(0.137)		(0.143)		(0.263)		(0.361)	
Avg. temperature in January (°F)	–0.000		–0.001		0.000		–0.002	
	(0.001)		(0.001)		(0.002)		(0.003)	
Days with 0.1+ in. of precipitation	–0.000		–0.000		–0.000		–0.001	
	(0.000)		(0.000)		(0.000)		(0.001)	
RPP Index (goods)	0.002		0.006		0.006		0.008	
	(0.003)		(0.003)		(0.004)		(0.006)	
RPP Index (rents)	–0.002	***	–0.002	***	–0.001		–0.002	*
	(0.000)		(0.001)		(0.001)		(0.001)	
Number of observations	75,433		68,807		75,433		68,807	
R-Squared	0.5460		0.4984		0.5319		0.3798	

Note: *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded. The robust standard errors are used to correct for heteroscedasticity.

Table 9. Summarized regression results with different subsample and estimation method

< Conspicuous Consumption >

	All cities			Exclude NY and LA			Tobit model (dy/dx)		
	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.
log(population)	0.043	(0.012)	**	0.079	(0.029)	**	0.203	(0.021)	***
log(population density)	0.052	(0.012)	***	0.019	(0.033)		0.075	(0.020)	***
Gini coefficient (%)	–0.016	(0.005)	**	–0.016	(0.008)	*	–0.063	(0.008)	***
Dissimilarity Index (%)	0.010	(0.003)	**	0.008	(0.004)	*	0.001	(0.004)	
log(own race's income)	–0.209	(0.055)	***	–0.218	(0.076)	**	–0.315	(0.076)	***
log(others' income)	–0.005	(0.059)		0.007	(0.081)		–0.044	(0.069)	
Restaurants and bars LQ	0.407	(0.137)	**	0.620	(0.216)	**	0.546	(0.107)	***
Avg. temp in Jan (°F)	–0.000	(0.001)		–0.001	(0.001)		0.001	(0.001)	
Rainy Days	–0.000	(0.000)		–0.000	(0.000)		–0.001	(0.000)	***
RPP Index (goods)	0.002	(0.003)		0.002	(0.002)		0.005	(0.002)	*
RPP Index (rents)	–0.002	(0.000)	***	–0.002	(0.001)	***	–0.004	(0.001)	***
Number of observations		75,433			52,149			84,253	
R-Squared		0.5460			0.5533			0.1242	

Note: *: p < 0.05, **: p < 0.01, ***: p < 0.001. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded for the first and second column. For the third column, a Tobit model was estimated and the corresponding marginal effects are reported above. The robust standard errors are used to correct for heteroscedasticity.

< Inconspicuous Consumption >

	All cities			Exclude NY and LA			Tobit model (dy/dx)		
	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.	Coef.	S.E.	Sig.
log(population)	0.101	(0.041)	*	0.108	(0.026)	***	0.250	(0.026)	***
log(population density)	0.020	(0.030)		–0.177	(0.029)	***	–0.007	(0.024)	
Gini coefficient (%)	–0.022	(0.013)		–0.009	(0.007)		–0.050	(0.010)	***
Dissimilarity Index (%)	–0.011	(0.009)		–0.004	(0.004)		–0.022	(0.005)	***
log(own race's income)	–0.213	(0.075)	**	–0.101	(0.124)		–0.484	(0.092)	***
log(others' income)	0.004	(0.099)		0.208	(0.115)		–0.028	(0.082)	
Restaurants and bars LQ	0.176	(0.263)		–0.019	(0.192)		0.045	(0.131)	
Avg. temp in Jan (°F)	0.000	(0.002)		–0.000	(0.001)		–0.004	(0.001)	**
Rainy Days	–0.000	(0.000)		0.001	(0.000)	*	–0.001	(0.000)	***
RPP Index (goods)	0.006	(0.004)		0.003	(0.002)		–0.002	(0.003)	
RPP Index (rents)	–0.001	(0.001)		–0.001	(0.001)		0.001	(0.001)	
Number of observations		75,433			52,149			84,253	
R-Squared		0.5319			0.5337			0.1122	

Note: *: p < 0.05, **: p < 0.01, ***: p < 0.001. The sample includes consumer units in the Primary Sampling Units from 2007 to 2013. The consumer units with zero expenditure on conspicuous, inconspicuous, or other consumption are excluded for the first and second column. For the third column, a Tobit model was estimated and the corresponding marginal effects are reported above. The robust standard errors are used to correct for heteroscedasticity.

APPENDIX

Table A. Consumption categories and their values of visibility index

Consumption Categories	Spending Items	Visibility Index	Conspicuous/ Inconspicuous
Cig	Tobacco products like cigarettes, cigars, and pipe tobacco	0.76	
Car	The purchase of new and used motor vehicles such as cars, trucks, and vans	0.73	Conspicuous
Clo	Clothing and shoes, not including underwear, undergarments, and nightwear	0.71	Conspicuous
Fur	Home furnishings and household items, like furniture, appliances, tools, and linen	0.68	Conspicuous
Jwl	Jewelry and watches	0.67	Conspicuous
Ot1	Computers, games, TVs, video, audio, musical and sports equipment, tapes, CDs	0.66	Conspicuous
FdO	Dining out at restaurants, drive-through, etc., excluding alcohol; including food at school	0.62	Conspicuous
AlH	Alcoholic beverages for home use	0.61	
Brb	Barbershops, beauty parlors, hair dressers, health clubs, etc.	0.60	
AlO	Alcoholic beverages at restaurants, bars, cafeterias, cafe´s, etc.	0.60	
Ot2	Cable TV, pets and veterinarians, sports, country clubs, movies, and concerts	0.58	
Bks	Books, including school books, newspapers and magazines, toys, games, and hobbies	0.57	
Edu	Education, from nursery to college, like tuition and other school expenses	0.56	
FdH	Food and nonalcoholic beverages at grocery, specialty, and convenience stores	0.51	
Hom	Rent, or mortgage, or purchase, of their housing	0.50	
Cel	Mobile phone services	0.47	
Air	Airline fares for out-of-town trips	0.46	
Htl	Lodging away from home on trips and housing for someone away at school	0.46	
Bus	Public transportation, both local and long distance, like buses and trains	0.45	
CMn	Vehicle maintenance, mechanical and electrical repair and replacement	0.42	
Gas	Gasoline and diesel fuel for motor vehicles	0.39	
Med	Medical care, including health insurance, drugs, dentists, doctors, hospitals, etc.	0.36	
Cha	Contributions to churches or other religious organizations, and other charities	0.34	Inconspicuous
Lry	Laundry and dry cleaning	0.34	
Utl	Home utilities such as electricity, gas, and water; garbage collection	0.31	
Tel	Home telephone services, not including mobile phones	0.30	
Fee	Legal fees, accounting fees, and occupational expenses like tools and licenses	0.26	Inconspicuous
CIn	Vehicle insurance, like insurance for cars, trucks, and vans	0.23	
HIn	Homeowner's insurance, fire insurance, and property insurance	0.17	Inconspicuous
LIn	Life insurance, endowment, annuities, and other death benefits insurance	0.16	Inconspicuous
Und	Underwear, undergarments, nightwear, and sleeping garments	0.13	

Source: Heffetz (2011)'s visibility index based on Harris and Sabelhaus (2005)'s spending categories.

Table B. Geographic areas in the consumer expenditure survey's primary sampling units

PSU	PSU Name	Definition (County, State)
A109	New York, NY	Bronx, Kings, New York, Queens, Richmond, NY
A110	New York-Connecticut Suburbs	Fairfield, Hartford, Litchfield, Middlesex, New Haven, Tolland, CT; Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk, Westchester, NY
A111	New Jersey Suburbs	Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, Warren, NJ
A102	Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD	New Castle, DE; Cecil, MD; Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Salem, NJ; Bucks, Chester, Delaware, Montgomery, Philadelphia, PA
A103	Boston-Brockton-Nashua, MA-NH-ME-CT	Windham, CT; Bristol, Essex, Hampden, Hampshire, Middlesex, Norfolk, Plymouth, Suffolk, Worcester, MA; York, ME; Hillsborough, Merrimack, Rockingham, Strafford, NH
A207	Chicago-Gary-Kenosha, IL-IN-WI	Cook, DeKalb, Du Page, Grundy, Kane, Kankakee, Kendall, Lake, McHenry, Will, IL; Lake, Newton, Porter, IN; Kenosha, WI
A208	Detroit-Ann -Arbor-Flint, MI	Genesee, Lapeer, Lenawee, Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, Wayne, MI
A210	Cleveland-Akron, OH	Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, Summit, OH
A211	Minneapolis-St. Paul, MN-WI	Anoka, Benton, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Stearns, Washington, Wright, MN; Pierce, St. Croix, WI
A312	Washington, DC-MD-VA-WV	District of Columbia, DC; Calvert, Charles, Frederick, Montgomery, Prince George's, Washington, MD; Alexandria city, Arlington, Clarke, Fairfax, Fairfax city, Falls Church city, Fauquier, Fredericksburg city, King George, Loudoun, Manassas Park city, Manassas city, Prince William, Rappahannock, Spotsylvania, Stafford, Warren, VA; Berkeley, Jefferson, WV
A313	Baltimore, MD	Anne Arundel, Baltimore, Baltimore city, Carroll, Harford, Howard, Queen Anne's, MD
A316	Dallas-Fort Worth, TX	Collin, Dallas, Delta, Denton, Ellis, Henderson, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, Wise, TX
A318	Houston-Galveston-Brazoria, TX	Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, San Jacinto, Waller, TX
A319	Atlanta, GA	Cleburne, AL; Barrow, Bartow, Butts, Carroll, Cherokee, Clayton, Cobb, Coweta, Dawson, De Kalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Haralson, Henry, Newton, Paulding, Pickens, Pike, Rockdale, Spalding, Walton, GA
A320	Miami-Fort Lauderdale, FL	Broward, Miami Dade, FL
A419	Los Angeles-Orange, CA	Los Angeles, Orange, CA
A420	Los Angeles Suburbs, CA	Riverside, San Bernardino, Ventura, CA
A422	San Francisco-Oakland-San Jose, CA	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma, CA
A423	Seattle-Tacoma-Bremerton, WA	Island, King, Kitsap, Pierce, Snohomish, Thurston, WA
A424	San Diego, CA	San Diego, CA
A429	Phoenix-Mesa, AZ	Maricopa, Pinal, AZ

Source: The Bureau of Labor Statistics (BLS). *Consumer Expenditure Survey Metropolitan Areas.* Retrieved from: http://www.bls.gov/regions/ce_areadef.pdf

Note: The list includes only "A" size PSUs with a population greater than 1.5 million, which are identified on the 2006–2014 Consumer Expenditure Survey Public Use Microdata.