

What happened to the American “Middle” class?

Class and Consumption in America

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February 2014

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ABSTRACT

The plight of the “middle class” has been a constant theme in political discourse and business press during the turn of the 20th century. Some argue that the “middle class” has been shrinking, while others contend that it is sinking or losing its ability to maintain its lifestyle. Those in the first camp see the “middle class” as a malleable cohort that can expand/contract in size over time, while those in the second group seem to define the “middle class” as a constant cohort whose income, wealth and consumption patterns vary over time. This lack of a consistent, objective and implementable definition of the “middle class” adds ambiguity to the controversy around this important segment of our society. In this study, we use a metric for socioeconomic stratification, based on the theoretical concept of Permanent Income, to classify households into the upper, middle and lower socioeconomic classes, based on data from the Survey of Consumer Expenditures (CEX), gathered by the Bureau of Labor Statistics between 1982 and 2010. Our analysis of the three major socioeconomic strata in America over the past three decades produces interesting and valuable insights into how the different strata in our society fared in the last three decades. First, we find that, despite the current debate on the plight of the “middle class” in America, households in the two middle quartiles of our society have seen some improvement in income, wealth and consumption, albeit not in the same extent as the upper quartile. Our empirical results show that the one stratum clearly left behind in the past three decades is the lower quartile, which did not see any significant improvements in income or wealth, and in fact saw a decline in their consumption budgets.

We find that the most visible shifts in the past three decades were observed on consumption, particularly on the consumption of positional (conspicuously consumed non-essential) goods and services, where the gap between the upper, middle and lower quartiles of Permanent Income have grown more dramatically. We see these discrepancies as a major source of discontent by the “middle class,” for two main reasons. First, discrepancies in consumption are more visible than discrepancies in income or wealth. Second, discrepancies in the consumption of positional goods are exacerbated by their signaling value, which results into welfare gaps not only on the direct utility of consumption but also in terms of positional losses.

KEYWORDS: consumption, middle class, consumer expenditures, social class, socioeconomic status

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Introduction

The main purpose of this study is to objectively document the changes in consumption observed across the major socioeconomic strata in America over the past three decades (1982-2010). Therefore, our study is descriptive in nature, attempting to shed some light on what has happened to the major socioeconomic classes, the so-called “middle class” in particular, of America during the turn of the past century.

Much has been said in the business and popular press about the plight of the “middle class” in America, especially within the context of political discourse. US Senator Elizabeth Warren, for example, notes that “A middle class lifestyle is increasingly out of reach for middle class families, many of whom are going broke trying to attain it,” and that “The cost of being middle class has shot out of the reach of the median family...” (Potier 2003). Some in the press argue that the middle class is shrinking or even disappearing (Kamp 2013; Morello 2012; Vigeland 2012) while others argue that the middle class is sinking or losing its ability to maintain its life style (Porter 2013; Potier 2003).

The concept of a middle class dates as far back as the writings of Aristotle, who defined this social class as being composed of property owners who serve as a moderating force in society, having both the ability and motivation to manage the state more effectively than the upper or lower classes (Aristotle in *Politics* 1295b2-1296a4). However in its long history spanning more than two millennia, the middle class has been associated with a wide range of values spanning from frugality to unbridled consumption. In the popular and business press, there is no

consensus on what constitutes the “middle class.” Even consumers don’t know whether they are “middle class” or not; a 2005 New York Times survey found that only 1% of respondents saw themselves as being in the “upper class” and only 7% considered themselves as being in the “lower class” (Cashel 2008). A 2008 Pew Survey (Taylor et al. 2008) showed that even though about 53% of the survey participants saw themselves as members of the middle class, one-third of Americans earning more than \$150,000 and 40% of those earning less than \$20,000 classified themselves in the middle class, thereby empirically demonstrating the lack of consensus on what exactly it means to be in the “middle class.” The US government, through the White House Task Force on the Middle Class, defines it based on the aspirations of a typical American family (home ownership, a car for each adult, college education for the children, health and retirement security, and family vacations) and builds the theoretical income required to meet these aspirations, reaching the conclusion that a married couple with two children would need an income between \$50,800 and \$122,800 (in 2008 dollars) to meet these aspirations. Other popular definitions of the middle-class include households with between two-thirds and double the nation’s median income (Dougherty 2013), or the middle 60% of households in terms of income (Dante 2013). These definitions of the “middle class” are too elastic and have been often stretched to the point where the concept becomes meaningless, unless more objectively defined, which is one of the purposes of our study.

In contrast to the wide discussion of the “middle class” in the popular and business press, which signifies the importance of social stratification in American society (despite the myth of America as a “classless” society), there has been limited academic research to objectively investigate the socio-economic shifts in American society, and their impact on consumption behavior. In fact, the scarce research on the measurement of social class has led the American

Psychological Association to commission a task force on this very topic, which concluded that past and current research efforts devoted to the conceptualization, measurement and impact of socioeconomic status were not commensurate to the importance and relevance of these issues to society (Saegert et al. 2006).

The importance of socioeconomic stratification to marketers cannot be left without saying, despite its obvious connection to lifestyle and consumption. According to some scholars (Deaton 1992; Friedman 1957) and public policy makers (Blank 2010) the definition of socioeconomic strata should be based on the ability to maintain a certain standard of living or lifestyle, concepts that are at the core of the marketing discipline. Socioeconomic stratification is also an essential basis for market segmentation (Wedel and Kamakura 2002). In our study, we look at the shifts in consumption patterns across the major socioeconomic strata in the US, to understand how lifestyles have changed over the past thirty years within each stratum. Therefore, rather than using it as a criterion for socioeconomic stratification, we take consumption as our dependent variable, in an effort to understand how socioeconomic shifts observed in the past three decades affected consumption within each major stratum. For marketers, it is important to detect socioeconomic shifts in a country, because they result into shifts in discretionary income across strata, which in turn have direct consequence into which consumption categories gain and lose demand. For example, the shifts in discretionary income towards the lower strata observed in Brazil in the past decade led to the emergence of a class of new consumers, with the consequent growth in the demand for consumer packaged goods (Kamakura and Mazzon 2013). In our empirical work, we show that the opposite has happened in the US in the past three decades, with increasing disparities in consumption, particularly for positional (Frank 2007) goods and services.

Next, we present a brief review of the literature on social class and socioeconomic status, in search for a theoretically supported and implementable conceptualization of socio-economic status to be define the major socioeconomic strata in America. We then develop a measurement model for socioeconomic status as a latent construct, which we apply to annual household-level data obtained from the Bureau of Labor Statistics for the 1982-2010 period, to objectively identify the upper, middle and lower classes in America in the past three decades. Once we define these three major strata and classify households in our sample according to them, we study how well these classes fared in the last three decades in terms of their ability to maintain a certain standard of living. We also study how their consumption patterns have changed in the same period, in response to price changes and their ability to pay.

We present empirical evidence that longitudinal and cross-sectional comparisons of socioeconomic strata in terms of income, wealth and consumption must be carefully done, to account for the fact that household composition varies significantly across strata and over time. Furthermore, we demonstrate that in order to compare consumption priorities across strata and over time, one must also take into account that households across strata and over time operate under distinct budgetary constraints. Therefore the observed expenditures reflect both the household's priorities and its budgetary constraints, requiring a budget allocation model to isolate these two distinct effects.

Our empirical results add objectivity to the political debate regarding the plight of the "middle class" in America, where the "middle class" is so subjectively and ambiguously defined as to render the debate meaningless. First, rather than relying on subjective and non-comparable definitions of the "middle class," we offer an unambiguous definition of this socioeconomic class, which allows us to track it over time. Second, we develop an objective stratification based

on this definition that allows us to make direct comparisons across strata and over time. While we do see that the middle class (as we define and operationalize it) has lagged behind the upper class in terms of income, wealth and consumption growth over the past three decades, we conclude that the Lower quartile of the population is the one who has been really left behind, with little real change in income and wealth, and actual decline in the consumption budget over more than a generation. Most importantly, we show that the upper class left the rest of American society behind in terms of consumption of positional goods and services (e.g. *Jewelry & Accessories, Airfare and Lodging*). Disparities in the consumption of positional goods are critical to the perceived well-being of a society because these goods/services are conspicuously consumed and are used by consumers to signal social status, thereby making the inequalities across social strata more vivid and more immediately felt.

Social Class and Socioeconomic status

Societies have been organized along a hierarchical structure from the earlier ages of humanity, since humans started to congregate in villages. The notion of social stratification has been used throughout history not only as a tool to study social relations, but also to distinguish members of any society in terms of their status, political power and economic power. In antiquity, Athenians belonged to three major classes: *Eupatridae, Metics* and *Slaves*, while Spartans were stratified into *Spartans, Perioeci*, and *Serfs*. Ancient Rome also had three major classes: *Patricians, Plebeians*, and *Slaves*. As early as the 3rd century BC, the Greek philosopher Aristotle already saw the stabilizing role of a large middle class, standing between the rich and the poor, for any society. Aristotle saw the rule of a large middle class as more moderate than oligarchy by the rich or democracy by the poor. This basic stratification into the upper, middle and lower classes has been prevalent for more than two millennia, sometimes with a division of

the middle class into an upper-middle, and lower-middle subclass (Beehgly 2004; Gilbert 2010; Thompson and Hickey 2005). While authors generally agree on the existence of these three major classes in most societies, there is still considerable ambiguity and inconsistency in the characterization of these classes within any society.

In academia there are two main streams of thought regarding class: a) the *analytical* concept of *social class*, in the Marxist and Weberian traditions, and b) the *empirical* implementation of *socio-economic status* widely utilized by marketers as a basis for market segmentation. In the *analytical* tradition, Marx (1959) characterized the class structure in a capitalist society as a conflict between two main classes: the bourgeoisie minority, who own the means of production, and the proletariat in the majority, who must sell their labor to the minority class (Wright 2005). However, Marx also acknowledged that in modern civilization “an industrial army of workmen, under the command of a capitalist requires, like a real army, officers (managers) and sergeants (foremen) who, while the work is being done, commanding the name of the capitalist” (Marx 1959, p. 332).

Max Weber’s social stratification goes beyond Marx’ focus on capital and labor (Breen 2005); his theory of social stratification is based on three factors: class (a person’s economic position), status (a person’s prestige, social honor and popularity) and power (a person’s ability to attain his/her goals). More recently, Wright (2005) started with Marx’ classic division of capital and labor, adding intermediate classes among the work force based on credentials and status, to identify 12 occupations that typify the social classes within a society. Goldthorpe, Llewellyn and Payne (1987) adapted Weber’s characterization of social classes, arriving at seven social classes based on market conditions (wages, upward mobility, economic stability) and

working conditions (production control, authority). This social stratification based solely on occupation is widely utilized in Europe (Bihagen, Neramo and Erikson 2010).

Within the *empirical* tradition, instead of focusing on the ownership, management and operation of the means of production, researchers emphasize the achievement of socioeconomic status within a society via education and income. In modern society, education prepares the citizen for the more rewarding professional careers, leading to higher income and socioeconomic status. Education also is attained early in adult life, and therefore is a lead indicator of status potential. Education and income were combined with occupation to produce the International Socioeconomic Index (Ganzeboom, De Graaf and Traiman 1992), as a measurement of socioeconomic status (Hauser and Warren 1997). However, socioeconomic stratification based on education and income carries several limitations. First, education attainment in modern societies is not defined only by access to the various levels of education, but also by the quality of the education received. In fact, much of the discussion about access to quality education in America relates to socioeconomic status (Newfield 2008). Second, formal education does not take into account on-the-job training, and other career investments that distinguish citizens with the same formal educational attainment. Third, current income is an ambiguous signal of socioeconomic status, because people also rely on social and physical assets to maintain a certain lifestyle; younger couples need more income than older people, because they are still in the process of acquiring these assets. Current income is also difficult to measure, because it comes from multiple sources, and survey respondents tend to recall more easily stable sources such as full-time salary, than less regular sources such as temporary work or dividends. Fourth, current income is not the sole basis for maintaining a certain standard of living, and socioeconomic status (Gilbert 2010). We also rely on assets (physical, social and financial) that we accumulate

throughout life. These assets include pensions, Social Security, a fully owned home and access to public services (health care, education, cultural activities, etc.).

Friedman (1957) argues that our standard of living is largely determined by *Permanent Income*, rather than current disposable income. Current income disregards the cumulative effects of a life of privilege or hardship (Duncan et al. 2002). Permanent Income, on the other hand, reflects the social, economic and physical assets accumulated through life, which make the citizen less susceptible to temporary downturns in the economic environment. A consumer with high Permanent Income will be less vulnerable to temporary unemployment, illness or other temporary shocks, because of the accumulated reserves. In contrast, a consumer with low Permanent Income will lack the “safety net” to face economic downturns.

However, Permanent Income is a theoretical construct that is not directly observable, and therefore must be measured as a latent variable, through observable indicators. Education and occupation are obvious indicators, because they allow individuals to accumulate Permanent Income in the form of social, financial and physical assets. Current income is also an obvious indicator, for similar reasons. Some authors (Bollen, Glanville and Stecklov 2006) posit that these are formative indicators of Permanent Income, because they build up Permanent Income. While this may be plausible on theoretical grounds, there are several reasons for using these consumer characteristics as reflective (rather than formative) indicators of Permanent Income. First, education is a precursor of occupation (because it prepares the individual for most occupations) and therefore is highly collinear with it. Second, current income is a direct consequence of education and occupation, and therefore is also highly collinear with them. These strong colinearities preclude the use of education, occupation and current income as formative indicators of current income. Most importantly, as a formative indicator, the

consequences of current income to Permanent Income should depend on the consumer's location and household composition, because the same level of current income will lead to very distinctive standards of living depending on where the consumer lives, and the type of household supported by that current income. This interaction between exogenous factors and indicators is not feasible for formative indicators; therefore, for pragmatic reasons, we measure Permanent Income as a latent variable using reflective indicators, after the proper adjustments on each indicator for household location and composition. These indicators are listed below, along with a brief justification for their inclusion in our latent measurement model:

- *Education and occupation of the head of the household* – as discussed earlier, these are indicators of the ability to accumulate Permanent Income
- *Current income* – an important, but not exclusive indicator of the ability to accumulate Permanent Income
- *Deductions for pensions* – an indicator that directly reflects the accumulation of Permanent Income for post-retirement use. One should expect that higher deductions from current income towards pensions reflect higher accumulation of Permanent Income.
- *Taxes paid* – an indicator that assumes local and federal governments are prone to tax more heavily those with higher accumulated Permanent Income. Therefore, higher taxes paid in a year reflect a higher accumulation of Permanent Income,
- *Financial assets* – this measure of accumulated financial assets is a reflective indicator of Permanent Income
- *Physical assets (automobile and home ownership)* – these measures for the two major assets in most households are reflective indicators of Permanent Income

The use of current income, education, occupation, and ownership of physical assets as reflective indicators for purposes of socioeconomic stratification is not uncommon in the literature. In fact, most schemes for socioeconomic stratification utilized by marketers across the world (particularly in emerging economies) rely on current income, education and a variety of other reflective indicators. Throughout Europe, this classification is commonly based on traditional indicators of social class (current income, education and occupation of the head of household), while in emerging economies the classification is based on a broader set of

indicators of socioeconomic status, including the possession of a variety of durable goods, as well as the traditional indicators of social class (Kamakura and Mazzon 2013).

Measuring Permanent Income

Our main goal is to define socioeconomic classes more objectively than commonly reported in the literature, business press and popular press. In order to track the consumption patterns of the major socioeconomic classes over time, we need an objective and easily implementable criterion to define these classes based on available data. We stratify the population of households in America in terms of quartiles of Permanent Income within the population of households in each time period, following the discussion in the previous section. First, we must develop a measure of Permanent Income as a latent construct. The Weberian conceptualization of social class and the European implementation of socioeconomic status, would lead us toward the utilization of income, education and occupation as formative indicators of Permanent Income (Bollen, Glanville and Stecklov 2006). Therefore, our first attempt in developing a measurement model for Permanent Income was a MIMIC formulation (Finch 2005) with education, occupation and income as formative indicators and financial and physical assets as reflective indicators. However, because of the practical limitations of formative indicators discussed earlier, we formulate our measurement model solely with reflective indicators. Moreover, the observed indicators are also explained by geo-demographic factors such as family composition and geographic location; the same current income may allow a household in Arkansas to maintain a higher standard of living than in California. Therefore, we must take into account that the same level of an indicator may signal different levels of Permanent Income, depending on household composition and geographic location, something that can be easily handled with reflective indicators.

For this purpose, we developed a flexible latent trait or item-response-theory (IRT) model that utilizes binary, continuous or count indicators (Wedel and Kamakura 2001) after adjusting for household composition and geography, to measure a latent (Permanent Income) trait of each household:

$$(1) \quad \mu_{i(t)j} = \alpha_{jt} + \sum_k \beta_{jkt} x_{ikt} + \lambda_{jt} \tau_{i(t)} + \varepsilon_{i(t)j}, \quad \text{where}$$

- $\mu_{i(t)j}$ = latent value for household i interviewed (nested) in period t and indicator j . This latent variable is linked to the observed value $y_{i(t)j}$ via an identity (for continuous indicators), logarithm (for counts), or logit (for multichotomous indicators) link function.
- α_{jt} = intercept for indicator j and period t .
- β_{jkt} = regression coefficient for indicator j on the k -th covariate for period t .
- x_{ikt} = characteristic (or indicator) k of household i for period t .
- λ_{jt} = factor loading for indicator j on the latent Permanent Income for period t .
- $\tau_{i(t)}$ = latent Permanent Income score for household i nested in period t .
- $\varepsilon_{i(t)j}$ = residual for indicator j and household i nested within period t .

The specification above is typical of latent trait or IRT models, except that we adjust each indicator for geographic and demographic differences across households, before utilizing their observed data as signals for each household's Permanent Income. In other words, we take into account that an indicator (e.g., current income) is not only reflective of the household's Permanent Income, but also of the household's geographic location and composition. For example, two households with the ability to maintain similar standards of living might show different current incomes, depending on whether they live in the south or west, or depending on the number of adults and children in the household. We also allow the estimates to vary over time periods, to account for the possibility that the observed indicators may reflect different levels of Permanent Income over time, despite the fact that many are already deflated at constant

prices. We estimate this flexible latent trait model using the iterative method described in Wedel and Kamakura (2001), except that in the maximization stage of the EM algorithm we include a regression of the observed indicators on the observed covariates x . The model in (1) is similar in intent to previous attempts to develop a Socioeconomic Index, via principal components analysis (Filmer and Pritchett 2011; McKenzie 2003), polychoric PCA (Kolenikov and Angeles 2009) or IRT (May 2006). However, the measurement model in (1) is distinct from these previous attempts in two important ways. First, rather than restricting to binary indicators as in these previous efforts, our measurement model is flexible enough to handle continuous, binary and counting indicators. Second, our measurement model accounts for the direct effects of location and household composition on the indicators, resulting in a latent measure of Permanent Income that is adjusted for these observable individual differences.

Because we allow the factor loadings to vary over time, one might have concerns regarding the comparability of scores across time periods. However, these scores do not need to be comparable across time periods, as they are only used within each time period, to sort households into quartiles of Permanent Income, only in comparison to households reporting their data in the same time period. Consequently, these factor loadings only affect comparisons within the same time period.

Socioeconomic stratification of American society from 1982 to 2010

In order to understand how the different strata of the American population fared from 1982 to 2010, we utilized the raw data gathered by the Bureau of Labor Statistics via their quarterly Consumer Expenditure Survey (CEX). A substantial portion of these data had already been extracted at the household level by the National Bureau of Economic Research, for the period from 1982 to 2003 (Harris and Sabelhaus 2000). We followed their extraction procedure

to complete the database up to 2010, obtaining a sample of 101,671 households over the 29-year period. Most importantly, this sample is representative and projectable of the US population of households in each year, via the projection weights reported by the Bureau of Labor Statistics.

Permanent Income

To measure the latent Permanent Income for each household in the CEX sample, we applied the latent-trait model in (1) to the indicators listed in Table A1 of Appendix A (and justified in an earlier section of this report), weighting each household by its projection weight (assigned by the Bureau of Labor Statistics), adjusted for attrition rates within each year, so that the sample in each year is representative of the US population of households. We isolated two components of current income (earned income and supplemental income) because it is possible that supplemental income might indicate lower rather than higher Permanent Income, something that will be determined empirically. As discussed earlier, we use taxes and other deductions as indicators because we assume the government to tax more individuals with higher Permanent Income, and because deductions signal investments in Permanent Income. Financial (cash and securities) and physical (number of automobiles, home ownership and home value) assets are directly related to wealth, an important component of Permanent Income.

Because the sample sizes for each year are relatively small (ranging from 1,353 households in 1995 to 5,208 in 2006) for identifying quartiles in the population of households, we grouped the data by periods of 5 years (4 years in the first period), increasing our sample sizes to 10,327 in the 1982-85 period and 25,297 in the 2005-10 period.

As described earlier, we adjusted each indicator of Permanent Income by the location and composition of the household, to account for the possibility that the same Permanent Income

might be reflected in different levels of the indicator, because of differences in the cost of living, jobs opportunities and other unobservable differences. For these corrections, we included geographic region (northeast, south, west) the number of adults and the number of children 18 years old or younger, which were among the limited geo-demographic data available from the CEX survey. It would be desirable to also adjust these indicators for other factors affecting the cost of living (e.g., large metropolitan areas) but this information was not available in the CEX extracts for the entire 29-year period. However, financial and other assets may serve as proxies for these adjustments, because the same current income will lead to more wealth accumulation in locations of lower cost of living or for smaller families.

The parameter estimates for the measurement model are reported in Table 1, where the first set of rows (intercept, northeast, south, west, adults and kids) show the adjustments made to each indicator for household location and composition. A glance through these estimates shows why these adjustments are necessary. For example, one can clearly see that income and home value tend to be higher in the northeast and west than in the Midwest (taken as the base) irrespective of the households' Permanent Income. Moreover, the estimates show that home value increased in value (at constant 1982 prices) over the six periods in the northeast and west, but declined in the south, in relation to the Midwest, for the same levels of Permanent Income.

TABLE 1 ABOUT HERE

The rows for "Permanent Inc" in Table 1 show the loadings for these indicators on the latent factor, suggesting that higher income and home value (in constant 1982 prices) were required in more recent years to maintain the same standard of living as in earlier years. The loadings for occupation on the latent variable show that the occupation with the strongest positive association

with Permanent Income is “Managerial, Professional”, followed by “Administrative Support, Technical, Sales, Self-Employed”, while “Not Working” and “Retired” show the strongest negative association. The loadings on Dwelling show something that may appear counter-intuitive at a first glance: that “Owned with Mortgage” is positively associated while “Fully Owned” is negatively associated with Permanent Income. This is probably due to the fact that households with full ownership of their homes tend to have older and retired heads of the household.

Socio-Economic Stratification

The latent scores $\tau_{i(t)}$ obtained from our measurement model are taken as measures of Permanent Income, which we then use to sort households into quartiles (weighted by the BLS projection weights) of Permanent Income within each 5-year period. According to the Middle Class Task Force at the Office of the Vice President of the United States (Blank 2010), most economic analyses of the middle class use current (rather than permanent) income as the sole defining measure (Frank 2007; Isaacs, Sawhill and Haskins 2008), which may be misleading for the reasons discussed earlier. Even when using a single indicator such as current income, researchers do not agree on the definition of the strata within society. Gilbert (2010), Thompson and Hickley (2005) and Beeghley (2004) classify between 45% and 47% of Americans in the same class. However, these authors place the “middle class” far from the middle; they see only 1% of the US population ahead of the middle class.

We define the two median quartiles as our “middle class,” following a common practice among economists and sociologists (Smeeding 2010), except that we define these quartiles in terms of permanent, rather than current income. While the stratification into quartiles may seem

similar to what is commonly found in the literature (Frank 2007, Isaac et al. 2008), one must be reminded that here, the stratification is done on the basis of the ability to maintain a certain standard of living, measured via the latent construct Permanent Income, while the common practice in the literature is to stratify based on current income. A comparison between our stratification scheme and the one based solely on current per-capita income shows a match of 69% across the three major strata, about halfway between perfect (100%) and random (33%) matching.

TABLE 2 AND FIGURE 1 ABOUT HERE

Table 2 and Figure 1 display the profiles of the three socioeconomic strata in terms of the indicators of Permanent Income across the six 5-year periods. First, Table 2 shows dramatic improvements in education over the past three decades for the three strata, although these improvements were observed at different levels for each stratum. The Upper and Median quartiles saw an increase in college graduates from 1982-85 (22% and 9%, respectively) to 2006-10 (36% and 18%), while the Lower quartile saw a substantial increase in high school graduation and some college attendance (from 38% in 1982-85 to 55% in 2006-10). Home ownership increased for the Upper and Median quartiles, but decreased within the Lower quartile, showing that one of the main aspirations for a “middle class” status (home ownership) is slipping away from the Lower quartile, with more than 56% of households in this stratum living in rented houses.

Regarding occupation, households with heads in managerial, professional positions increased their representation in the Upper quartile from 52% in 1982-85 to 61% in 2006-10, while households with heads in administrative support, technical, sales and self-employed positions

have seen their representation in the Upper quartile decrease in the same period (from 25% to 16%). Households with heads who are not in the working force or are retired have consistently represented the majority (over 60%) in the Lower quartile. These results show that households in the Upper quartile are distancing themselves from the other quartiles in the professions they choose and in the qualifications they accumulate from formal education.

The most dramatic shifts in the past three decades are found in income and wealth (Figure 1), with the Upper quartile observing dramatic gains in income and assets (financial and physical, measured in constant 1982 prices). More telling is the fact that the Median quartiles also observed considerable gains in income and wealth (albeit not in the same order of magnitude as the Upper quartile), while the Lower quartile has seen little change in income and wealth over the past three decades. The obvious consequence is a dramatic increase in the disparity among these strata, particularly between the Lower quartile and all other households. Therefore, in terms of wealth and current income, the stratum that has seen the greatest and growing disparity from the rest of society is the Lower quartile, rather than the widely cited “middle class,” which in fact saw some palpable improvements in income and wealth. At constant prices, the Lower quartile has seen virtually no change in disposable household income (all income net of taxes and other deductions), with an average annual increase of only 0.2% per year in the past three decades, compared to 0.5% for the Median quartiles and 1.8% for the Upper quartile. While the relative wealth and income of the “middle class” has not grown as much as the Upper quartile, it has clearly seen an improvement in real terms, particularly since 1996. The wealth (financial assets plus market value of owned home) of the Upper quartile grew by an average of 3.5% per year in real terms (constant prices) in the past three decades, compared to 1.7% for the Median quartiles and 0.3% for the Lower quartile. Once again, rather than the “Middle Class,” the

Lower quartile has been clearly left behind in the last three decades, leading to a visible increase in disparity both in income and wealth relative to the Middle and Upper quartiles. Aside from the lack of a discernible improvement in income and wealth over almost three decades, the Lower quartile saw its relative standing drop quite considerably, particularly in relation to the Upper quartile; in the first (1982-1985) period, the Upper quartile had an average disposable income that was 3.8 times larger than the Lower quartile. This ratio grew to 5.5 in the last (2006-2010) period.

Geo-demographic Profile of the Socioeconomic Strata

Given the substantial changes in the distribution of income and wealth across the strata, it is important to know the geo-demographic profile of these strata over the years, to see what type of American gained or lost in relative socioeconomic standing in the past three decades. For this purpose, we estimated a multinomial logistic regression of class membership as a function of geo-demographic characteristics. The results, displayed in Table A2 of the Appendix, lead to the following conclusions:

- Households headed by men in their 30s to 50s fared better than those with younger (30 and under) and older (61 and older) heads. However, the situation for households with heads older than 60 has been improving in recent years.
- Households with male heads are more likely to be in the Upper and Middle quartiles than those headed by females.
- The larger the number of adults and kids living in the household, the greater the likelihood of being in the Median quartiles. Historically, households with more adults and kids were less likely to be in the Upper quartile.
- Households with Caucasian heads are more likely to be in the Median quartiles, while those headed by African–Americans are more likely to be in the Lower quartile.
- Households living in the south and Midwest are more likely to be in the Median quartiles than those in the west, while those living in the northeast are more likely to be in the Upper quartile than those living in the west.

Class and Consumption in America from 1982 to 2010

The main purpose of this study is to document the changes in consumption over the past three decades across the major social strata in America. Therefore, aside from the indicators of Permanent Income utilized to stratify the population of households, we also gathered data on consumption expenditures from the same sample households in the CEX surveys. For this extraction, we followed the process described in the NBER family-level extracts (Harris and Sabelhaus 2000), but created different categories, which were best matched with the BLS category-level price indices. These categories are listed in the Appendix (Table A3), along with the price indices we utilized for each consumption category.

Consumption and Price Data Summary

Figure 2 displays summaries for some of these expenditures over the 29-year period (at constant 2010 prices), grouped in four major groups of products/services with the most substantial changes in consumption in the past three decades. Two expenditure groups with substantial decline in quantity consumed in the past three decades were *Personal Care* and *Food & Beverages*, probably due to the reduction in the average household size (from 2.70 members in 1982-85 to 2.53 in 2006-10) in the CEX sample. On the other hand, despite the decline in household size, Figure 2 shows an increase in the quantity consumed on *Housing*, suggesting that Americans, on average, were upgrading their housing facilities in the past three decades. Similar growth in consumption was observed in *Other (Recreation, Education, Charity and Lodging)*.

FIGURE 2 ABOUT HERE

The comparison of expenditures at constant prices in Figure 2 gives a clear indication about the growth or decline in the volume consumed, but hides away some dramatic differences in price inflation across categories. These dramatic differences in price trajectories can be seen

in Figure 3, comparing the price indices for selected consumption categories. While *Apparel* prices grew by less than 50% over the past three decades, the price of *Tobacco & Smoking Products* grew nine-fold in the same period. The second highest price increase was found in *Hospital & Related Services* (almost 600%), followed by *Education* (500%), *Prescription Drugs* (350%) and *Motor-Vehicles* and *Health Insurance* (300%). Notice that except for *Tobacco & Smoking Products*, these categories with extreme price inflation in the past three decades are all in the aspiration set for the so-called “middle class” (health security, college for the kids, car for each adult, retirement security and family vacations), according to the Middle Class Task Force (Blank 2010).

FIGURE 3 ABOUT HERE

Consumption by Socioeconomic Stratum

Most importantly, the longitudinal shifts in consumption shown in Figure 2 were not evenly distributed across socioeconomic strata. Figure 4 breaks down the expenditure data (at constant 2010 prices) by our three socioeconomic strata. From Figure 4 one can see that the quantity consumed in *Personal Care* products/services declined much more in the Upper and Median quartiles than among households in the Lower quartile, even though all three social strata reduced their consumption on this non-essential group, probably to shift the consumption budget to more pressing needs such as *Housing*, where consumption has increased across all strata. However, households in the Upper quartile still consume over 4 times more in *Personal Care* than those in the Lower quartile.

FIGURE 4 ABOUT HERE

In contrast, the quantity of *Medical* goods and services consumed by households in the Lower quartile dropped substantially since 1991, and now households in the Upper quartile spend more than twice as much as those in the Lower quartile in the *Medical* group. Consumption of *Medical* goods and services grew in the Upper quartile, but declined in the other two strata, indicating that the only stratum attaining greater *Health* security, considered one of the major aspirations of the “middle class” (Blank 2010), was the Upper quartile; the Median and Lower quartiles consumed less *Medical* goods and services in 2006-10 than they did in 1982-85. For the Lower quartile, the drop in *Medical* consumption was quite substantial, from \$3150 to \$2090 at 2010 prices, indicating that in almost 30 years, the Lower quartile reduced its consumption of *Medical* goods and services by 32%. Unless this drop in consumption was replaced by public health, these results should represent a considerable degradation of health in the Lower quartile.

Two other expenditure groups where the disparity in consumption has grown are *Housing*, and *Other Expenses* (Recreation, Education, Charity and Lodging Out). The Upper quartile now spends almost twice as much in *Housing* and more than four times as much in *Other Expenses*, as those in the Lower quartile. Moreover, these two categories saw considerable growth in consumption in the Upper and Median quartiles. The Upper quartile consumed 39% more in *Housing* in 2006-10 than in 1982-85, compared to 14% more in the Median quartiles and 20% in the Lower quartiles, all at constant prices. This increase in the consumption of *Housing* is particularly significant because this expenditure group represents a considerable portion of the household budget across the three strata, and therefore this increase in consumption must have come in detriment of other consumption groups such as *Health* (for the Lower quartile) and *Personal Care* (across all strata). In *Other Expenses* (Recreation,

Education, Charity and Lodging out), the Upper quartile consumed 37% more in 2006-10 than in 1982-85, while the growth in consumption between the same periods for the Median and Lower quartiles was 28% and 20%, respectively.

The increasing disparity in consumption across the three major socioeconomic strata is more troubling than the disparity in income and wealth, because consumption is a direct reflection of the life styles afforded by households in each stratum. As recently noted by several scholars (Dynan and Ravina 2007; Frank 2007), inequalities in consumption are a critical source of unhappiness in a society. This is particularly true for “positional goods” (Frank 2007; Kamakura and Du, 2012), non-essential goods and services that are conspicuously consumed. This category of goods/services provides value to consumers not only from direct consumption but also from their signaling or “status” value, leading to competitive consumption, where consumers are induced to “up the ante” faced by the signaling of others. This “positional arms race” (Frank 2007, pg.5) leads to increasing disparities in the consumption of positional goods as income and wealth inequalities increase. This phenomenon is documented in Figure 5, which shows the disparity in consumption between the two extreme quartiles of Permanent Income for positional and essential goods/services in the past three decades. The top panel of Figure 5 shows the ratio of average expenditures between the Upper and Lower quartiles for goods/services that are non-essential and conspicuously consumed (i.e., positional), while the bottom panel shows a similar chart for essential goods/services. As one would expect, the disparity in consumption is much greater for positional than for essential goods/services. Most importantly, Figure 5 also shows that this disparity has grown quite dramatically in the past three decades for the positional categories, particularly for those where the inequality was already large (e.g., *Lodging, Jewelry & Accessories, and Airfare*). This increasing inequality in

positional consumption must have contributed more to the growing voice of discontent on the lower strata of America than the inequalities in income and wealth, because disparities in consumption are more visible than those in income and wealth, and because of the strong signaling value of positional goods, which makes the lower strata feel even further behind the upper strata.

FIGURE 5 ABOUT HERE

Socioeconomic Stratification and Consumption Budget

The comparison of expenditures by category in Figures 2 and 3 makes it difficult to assess how the total consumption budget for the typical household in each socioeconomic stratum has changed over the past three decades. This comparison of consumption budgets across socioeconomic strata is shown in Table 3, in real terms (at 2010 prices). However, a direct comparison of average household budgets (left panel of Table 3) is confounded by the fact that household composition and geographic distribution has changed within each socioeconomic class (see Table A2 in the appendix) in the past three decades. For a more objective comparison of consumption budgets, we applied a generalized linear model on the observed annual household budgets, including the same geo-demographic characteristics and interactions utilized in our previous geo-demographic analysis (Table A2 in the Appendix), and report the marginal averages on the right panel of Table 3, which represent adjusted household budgets after accounting for differences in household composition and location. These results clearly show that the Upper and Median quartiles have seen an increase in the budget available for consumption, while the consumption budget for the Lower quartile actually declined in real adjusted terms over the past three decades. Once again, we see that the socioeconomic stratum

being left behind over the last three decades is the Lower quartile, rather than the “middle class,” or Middle quartiles. The fact that consumption budgets are increasing much more at the Upper quartile, and actually decreasing in real terms in the Lower quartile, carries important implications to marketers, depending on the type of consumption expenditures they compete for. As shown next, consumption priorities among households in the Upper quartile are distinct from the other strata, favoring non-essential categories. As consumption budgets expanded in the upper strata and shrunk in the lower stratum, demand shifted from essential towards non-essential goods and services.

TABLE 3 ABOUT HERE

Engel Curves

For a better understanding of the differences in consumption behavior across socioeconomic strata (and also within strata), we now look at the annual consumption by households surveyed in the last period (2006-2010), first categorizing their annual budget (at constant 2010 prices) into deciles, and then plotting the share of the annual budget devoted to each consumption group by households in each budget decile and socioeconomic stratum. These budget-allocation plots, known as Engel curves (Kamakura and Mazzon 2013), help understand consumption priorities across strata. Figure 5 shows the Engel curves for the six major consumption groups, displaying only results based on samples larger than 400 households to minimize sampling error.

The Engel curve for Food & Beverages is typical of an essential good, with allocated shares dropping as the consumption budget increases, and showing a steep decline, with the smallest budget (in the Lower quartile) allocating more than 30% to this category, and the largest

budget (in the Upper quartile) devoting less than 20% to it. Surprisingly, for the same budget levels (e.g., \$30,000), the Middle quartiles devote a slightly lower share than the Upper or Lower quartiles to this expenditure group.

The Engel curve for Personal Care is typical of a non-essential good, with allocated shares increasing with the consumption budget. As one would expect, for the same budget, households in the Lower quartile allocate a smaller share to this non-essential group than those in the Middle quartiles, who in turn devote a lower share than those in the Upper quartile. A similar pattern is shown for Other Expenses (Recreation, Education, Charity and Lodging Out).

The Engel curve for Medical implies an essential good for the Lower and Middle quartiles, but a non-essential for the largest consumption budgets among Upper quartile households. A similar pattern is found for Transportation, with the Lower quartile allocating its consumption budget to this group as an essential good, and the Upper quartile treating it as a non-essential, probably because for the former stratum this consumption group represents basic, mass transportation, while for the later it represents personal luxury vehicles and vacation trips, treated as positional goods.

The opposite pattern is shown for Housing where, at the lower levels of the annual consumption budget, allocations imply a non-essential good, with decreasing shares as the budget increases, and lower shares for the same budget as one moves from the Lower quartile to the Median and Upper quartiles. In contrast, at higher budget levels for the Upper stratum, allocated shares increase, suggesting an essential good. This is probably a distortion caused by measuring the rent-equivalent cost for owned housing as a proportion of the house's market value, which confounds investment value with rent-equivalence.

Another valuable insight one may extract from the Engel curves in Figure 5 is that households (in the Lower quartile) with the lowest annual budget devote more than 70% of their annual consumption budget to Housing and Food & Beverages, contrasted with less than 45% of the annual budget for households (from the Upper quartile) in the top budget decile, illustrating the stringent budgetary constraints faced by households in the Lower quartile.

If the trends observed in the past three decades persist, with the consumption budget growing much faster at the Upper quartile than among other households in real terms, then one can expect consumption to shift to the right in Figure 6 along the dotted line (for the Upper quartile), further reducing the share allocated to Food & Beverages, Medical and Transportation, and increasing the shares allocated to Personal Care, Other Expenses and, possibly, Housing.

FIGURE 6 ABOUT HERE

Consumption Priorities of the Socioeconomic Strata

The expenditure patterns of the three strata across consumption groups over the six time periods previously shown in Figure 4 suggest that households in the Median quartiles tend to behave more similarly to those in the Lower quartile than those in the Upper quartile. However, one must take into account that the geo-demographic profiles are quite distinct across these strata, as previously discussed (Table A2 in the Appendix). Therefore, some of the similarities and differences in consumption behavior across strata might be due to differences in location (weather, customs, etc.) and household composition (family size, life-stage, etc.). Consequently, any comparison of the consumption priorities across the three strata must also take into account these geo-demographic differences. In order to parse out these geo-demographic effects from the socio-economic effects on consumption priorities, we estimated

the budget allocation model described in Du and Kamakura (2008). This budget allocation model offers many benefits for the analysis of annual consumer expenditures. First, it takes into account the multivariate nature of the decision making process, assuming that each household had to allocate its discretionary income across multiple competing consumption categories, to meet its needs throughout the year. Second, the model handles the unique characteristics of the observed allocations, with many categories receiving zero budget allocations that vary considerably across households, and a clear budget constraint that also varies across households. Third, this budget allocation model allows us to isolate two important drivers of the observed allocations: a) consumption priorities, which determine how a household prioritizes the allocation of the limited discretionary income across the various consumption categories, to meet the needs of the household, and b) a budget effect, which forces households with more limited discretionary incomes to focus their allocations towards essential consumption categories, and allow wealthier households to “splurge” on non-essential consumption. Finally, and most importantly for our purposes, this budget allocation model allows us to explain the differences in consumption priorities across households due to geography, household composition and socioeconomic stratification, thereby allowing us to isolate the impact of socioeconomic stratification on consumption, from other household characteristics. This is important for this study because a separate stratification analysis for each geo-demographic group would result into very small sample sizes within each group, rendering the results unreliable. The budget allocation model allows us to “borrow” information from all households to obtain more robust estimates of the longitudinal socio-geo-demographic effects.

Following Du and Kamakura (2008), we assume that household i maximizes a direct utility function $G(q_i)$ over a set of J non-negative quantities $q_i = (q_{1i}, q_{2i}, \dots, q_{ji})$ for all

consumption categories, subject to a budget constraint $p'q_i \leq m_i$, where $p = (p_1, p_2, \dots, p_J)' > 0$ contain the price for the competing consumption categories, and m_i is household i 's total (exogenous) consumption budget. Following Du and Kamakura (2008), we use the Stone-Geary utility function, which has the form:

$$(2) \quad G(q_i) = \sum_{j=1}^J \alpha_{ji} \ln(q_{ji} - \beta_j)$$

where $\alpha_{ji} > 0$ is a household-specific ‘‘taste’’ parameter defining its consumption priorities for category i and $(q_{ji} - \beta_j) > 0$. This budget allocation problem implies that the household

incrementally allocates its disposable income to the consumption category that produces the

highest marginal utility per dollar, $\frac{\partial G(q_i)}{\partial q_{ji}} \frac{1}{p_j} = \frac{\alpha_{ji}}{(p_j q_{ji} - p_j \beta_j)}$, given the current consumption levels

q_i , until the budget limit is reached, or $\sum_{j=1}^J p_j q_{ji} = m_i$. A useful metric for comparing consumer i

priorities across the J consumption categories is the initial marginal utility per unit (before any

unit is consumed on any consumption category), $\frac{\partial G(q_i=0)}{\partial q_{ji}} = \frac{\alpha_{ji}}{-\beta_j}$. This initial marginal utility per

unit allows a *ceteris paribus* comparison across consumption categories because at this initial

point (before the budget allocation starts) all consumption categories are at the same

consumption level.

Instead of allowing only for unobserved heterogeneity (i.e., diversity in underlying preferences not accounted by the observed predictors) in the taste parameter (α_{ji}) for each category i , as in Du and Kamakura (2008), we also explain the households' consumption priorities using descriptors of the households' composition and their socioeconomic classification, captured by the predictor vector ($W_{i(t)}$)

$$(3) \quad \alpha_{ji(t)} = \exp(\gamma_j + \delta_j W_{i(t)} + \lambda_j Z_{i(t)} + \varepsilon_{ji(t)}),$$

where

- γ_j = intercept for consumption category j .
- $Z_{i(t)}$ = k -dimensional factor scores for household i within period t that capture unobserved heterogeneity in consumption priorities across households.
- λ_j = k -dimensional factor loadings for category j , which capture correlations among consumption categories due to unobserved differences in consumption priorities across households.
- $W_{i(t)}$ = vector of exogenous characteristics of household i , nested within period t , to account for longitudinal geo-demographic effects on consumption priorities. The following exogenous socio-economic and geo-demographic characteristics, available in the CEX database, are considered:
 - number of adults and number of kids in the household
 - region where household is located
 - race of the head of household
 - age of head of household
 - Socio-economic stratum according to the proposed stratification model
 - 5-year periods
 - 2-way interactions between each predictor and time period to account for trends
- δ_j = vector of regression coefficients.
- $\varepsilon_{ji(t)}$ = random error (assumed as independently identically distributed, because correlations across categories and households are captured by the latent factor structure $(\lambda_j Z_{i(t)})$).

We estimated the budget allocation model with the direct utility function described in (2) and (3) with 1 to 8 latent factors, and based on the Bayesian Information Criterion concluded that a 6-factor model offered the best balance between accounting for unobserved heterogeneity and model parsimony. Table A4 in the Appendix shows how well the model fit to the observed consumption data across over a hundred thousand households. The second column of Table A4

shows the incidence rate for each category, showing the proportion of the 101,671 Households reporting some (non-zero) expenses in the category. As one would expect the incidence rate is relatively low for consumption categories such as Hospitals (15%), Airfare (30%) and Tobacco (38%). One consumption category with surprisingly low incidence rate (30%) was Non-Prescription Drugs, probably because some of these expenses might have been reported in the Personal Care group. The third column of Table A4 displays the hit-rate, or proportion of times the budget allocation model correctly predicted whether the household would (or would not) spend some of its budget on each category. Generally, one can see that categories with lower incidence rates are more difficult to predict than those with higher incidence rates. The last column shows the percentage of variance explained for individual expenses in each category, among households that reported non-zero expenditures. As with the hit rates, the percentage of variance in expenditures explained by the budget allocation model was generally better for high-incidence categories than for the lower-incidence ones. Considering that these measures of fit are computed across more than a hundred-thousand households, the budget allocation performed fairly well on the CEX database.

The parameter estimates for the budget allocation model are reported in the Web Appendix on Table A5. These parameter estimates are left on an Appendix because they are too numerous and difficult to interpret directly, because the impact of each predictor on the direct utility for each consumption category is only interpretable in relation to all other categories, similar to the way one would interpret the results from a multinomial choice model.

As discussed earlier, the main purpose for estimating this complex budget allocation model was to isolate the longitudinal differences in consumption priorities due to socio-economic status from longitudinal differences that are explained by households' geo-

demographic profiles or unobserved heterogeneity. In other words, one main goal for this budget allocation model was to tease out the intrinsic differences in consumption priorities from other observed and unobserved influences. The second goal was to isolate consumption priorities from differences in budget allocation that are caused by budget effects (the fact that poorer households must meet their basic needs before spending on non-essential products and services, while wealthier households have more freedom to “splurge” on these non-essentials).

For a more intuitive interpretation of the relevant parameters of the budget allocation model, we convert the initial ($q=0$) marginal utilities per unit for each category and social class over time into “preference shares” (Du and Kamakura 2008, pg. 121), which reflect the consumption priorities assigned by households in each socioeconomic stratum. However, in order to isolate the socioeconomic differences from geo-demographic ones, we estimate and compare the preference shares for the same household geo-demographic profile (2 adults, 2 kids, Caucasian male household head 31-40 years old, living in the Northeast) across the socioeconomic strata. These preference shares or consumption priorities are displayed in Figure 6 for the three major socioeconomic strata over the past three decades. The most obvious conclusion one draws from Figure 6 is that, in contrast to the dramatic differences in actual consumption observed across the three socioeconomic strata (Figure 4), the consumption priorities are relatively similar across the three strata, albeit following general patterns that resemble those observed on actual consumption. For example, consumption priorities for essential categories such as Food & Beverage and Housing increase as one goes down the socioeconomic ladder, while the relative importance for non-essential consumption such as Personal Care, and Other Expenses (Recreation, Education and Charity) decrease down the socioeconomic stratification. Another obvious pattern in consumption priorities is found over

time, with Personal Care decreasing substantially in relative importance over the past three decades, and Transportation and Other Expenses increasing in importance during the same period.

FIGURE 7 ABOUT HERE

The substantial discrepancies between consumption priorities shown in Figure 7 and actual expenditures (Figure 4) are due mostly to the large differences in consumption budget (shown in Table 3), which have two effects. First, a larger budget will result in greater expenditures on all categories. Second, a larger consumption budget allows the household to “splurge” on non-essential consumption that is not as feasible to households operating under more stringent budgetary constraints, leading to a greater emphasis on non-essential consumption, something we discussed earlier as the “budget effect”. Another source of differences between observed expenditures and consumption priorities is the fact that the later have been adjusted for geo-demographic factors that also affect consumption, because our main goal was to isolate the differences in consumption priorities that are inherent to the socioeconomic strata. However, one must take into consideration that consumption priorities are marginal preferences, conditional on the current levels of consumption. In other words, as the household spends more of its budget on any consumption category, the marginal value of that category decreases. Therefore, the consumption priorities displayed in Figure 6 reflect only the *ex-ante* household’s initial priorities, before the budget allocation started (i.e. when $q=0$).

For a better appreciation of the *ex-post* differences in consumption priorities across socioeconomic strata and their implications to consumption behavior, we applied the estimated budget allocation model in policy simulations, where we simulated the budget allocations for the

same 101,671 households in our sample under two different scenarios. In these policy simulations we used the estimated unobserved heterogeneity in consumption priorities and the households' actual socio-economic classification and actual category prices, but manipulated the geo-demographic profiles and consumption budgets. Once again, in order to control for geo-demographic differences in consumption needs, we assume the same "standard" geo-demographic profile (a household headed by a 41 to 50 -year old Caucasian male, with 2 adults and 2 children living in the Northeast) for all households. The results of these policy simulations are reported in Table 4.

TABLE 4 ABOUT HERE

In the first scenario, we simulated how the "standard" households would allocate their actual consumption budget. Comparing the average simulated allocations (second set of rows in Table 4) with the observed allocations (first set of rows) we can see the impact of geo-demographic differences in the households onto their budget allocations. While there are substantial differences between the observed and simulated allocations, the differences in allocations across socioeconomic strata tend to be greater than the differences between the simulated and observed allocations.

In the second scenario, we simulate how the "standard" households would allocate the same consumption budget, fixed to the median annual budget in the Lower quartile. This second scenario shows the inherent differences in consumption priorities across strata, after discounting for differences in consumption due to budget effects and geo-demographic profile.

Comparing the average simulated allocations under the second scenario and the first one, we can see the magnitude of the budget effect on consumption. When allocating their actual

consumption budgets (as opposed to the limited budget fixed in the second simulation), allocations to Housing decrease while allocations to Food & Beverages decrease for all socioeconomic strata, although the differences between the two simulation scenarios are not as substantial as those observed across strata. The results from the second (fixed budget) scenario indicate that the lower strata place higher priorities on essential goods such as Housing and Foods & Beverages than the higher strata, while the opposite happens for non-essential categories such as Personal Care, and Other Expenses (Recreation, Education and Culture).

As the reader may recall, these results confirm what we found for the last quinquennium, when analyzing the Engel curves in Figure 6. However, the three sets of results shown in Table 4 parse out geo-demographic (first scenario) and budget effects (second scenario). A comparison of the three sets in Table 4 shows that, as we parse out the geo-demographic and budget effects, the differences across strata become more accentuated, although the general conclusions drawn from the observed allocations still hold.

The empirical evidence in Table 4 strongly suggests that allocations of the consumption budget across product/service categories are affected more substantially by socio-economic status than by geo-demographic differences across households, or by the budget effect. This empirical evidence supports the widespread use of socioeconomic status as a basis for market segmentation, particularly in Emerging Economies (Kamakura & Mazzon 2013, Corrales, Barberena & Schmeichel 2006).

Conclusions and Directions for Future Research

Contrary to what is often said about the plight of the “middle class” in America (which should represent the core of the US population, as in any other society), we find that this

socioeconomic stratum was not the one most negatively affected by the concentration of income and wealth observed in the past three decades. Our empirical evidence clearly shows that the poorest lower quartile of our society did not benefit from the economic growth observed in the past thirty years. While the income and wealth of this lower stratum has not deteriorated in real terms, one must look at this stagnation in light of the 48% growth in the inflation-adjusted per capita GDP in the US during the same period. Most importantly, the standing of the Lower quartile in relation to all other households has deteriorated quite considerably, due to the substantial gains attained by the upper echelons, particularly in the upper quartile of Permanent Income.

As for consumption (which was, after all, the main focus of our research effort), the situation for the Lower quartile was even worse than for income and wealth. The geo-demographically adjusted consumption budget in the Lower quartile for the last quinquennium, measured at constant prices, was in fact 2% lower than in the first quinquennium within our sampling period of 29 years. In other words, the Lower quartile consumed less in real terms now than 30 years ago, despite the fact that the US per capita GDP grew by 48% in the same period. In comparison, the same geo-demographically adjusted budget grew by 6% for the Middle quartiles and by 20% for the Upper quartile in the same period.

The disparity in consumption between the two extremes of America are even more troublesome when drilled down to specific consumption categories, particularly for positional goods and services, where the inequalities between the Upper and Lower quartiles have grown dramatically in the past three decades. This growing inequality in positional consumption is more troublesome than the disparity in income and wealth for two main reasons. First, positional consumption has signaling value, in addition to the direct utility consumers accrue from

consumption. Therefore, those who were left behind felt the distance from the rest of society growing both directly (in consumption value) and indirectly (in positional value). Second, positional consumption is conspicuous by definition (Kamakura & Du 2013) and therefore, inequalities in positional consumption are more immediately noticeable than those in income or wealth.

We should remind the reader that the CEX surveys are applied to independent samples over time and therefore its database is not gathered from a longitudinal panel. Consequently, all longitudinal comparisons we reported in this study refer to cohorts represented by different samples in each time period. In other words, when we concluded that the Lower quartile was left behind the rest of society in the past three decades, we did not imply that households who were in the Lower quartile in the earlier quinquennia were left behind in subsequent periods. Because we tracked quartiles, rather than individual households over time, our results and conclusions only apply to these broad cohorts, which were represented by different sampled households in each year. It is possible that individual households have moved up and down the quartiles of Permanent Income over time but, because we did not track the same panel of households over time, we have no information to draw any inferences about upward or downward mobility in America. For this form of longitudinal inference, one would need a longitudinal panel such as the University of Michigan's Panel Study of Income Dynamics (PSID). Because our main focus was on consumption (not covered in the PSID study), we chose to rely on the independent CEX surveys.

As we disclaimed at the very beginning of our empirical work, our conclusions relied on relatively small samples in each year, despite the fact that we combined the annual samples into larger quinquennial samples. The validity of our results depends on the representativeness and

projectability of the CEX sample to the population of households in each 5-year period, based on the projection weights provided by the data source. Because of the limited sample, we refrained from making volumetric inferences about total consumption in each expenditure category or about the concentration of income, wealth and consumption across strata. Inferences regarding the concentration of income and wealth would be best drawn from Census data or at the very least from the PSID study, which relies on a much larger sample of households, who are individually tracked over time.

Because the main focus of our study was on consumption, we relied on the CEX surveys, which allowed us to relate consumption to Permanent Income, measured via multiple indicators. However, we did not have enough information to learn about how this Permanent Income was accumulated within each household, nor about the contribution by each household member to its Permanent Income. It is often mentioned in the popular press that the growing number of dual-income households in the US in the past decades was a reaction by the “middle class” in order to maintain or enhance its status in terms of Permanent Income and consumption. In order to understand the real facts regarding this phenomenon, one would need more detailed information not only about the income contributions by each household member, but also about the contributions in non-monetary terms. A dual-earner household might enhance its socioeconomic status in Permanent Income, but this gain might not reflect into the comparable improvements in the standard of living, if the additional income comes in detriment of other services previously provided within the household. This substitution between time and income could only be detected by a joint study of time use and consumption. Unfortunately, time-use sources (e.g., the Bureau of Labor Statistics US Time Use Survey) do not match the sources of Permanent Income

indicators, and therefore some integrated “data-fusion” model would be required to concatenate the analyses of time and consumption, which we leave for future research.

Table 1a – Parameter estimates of the Latent Trait model measuring Permanent Income

Period	Covariate	Income	Income supplement	Deductions	Pensions	Taxes	Cash	Securities	Home value	Number of autos
Years 82-85	Intercept	6655	1877	477	1996	1317	8588	13390	40094	-0.028
Years 86-90	Intercept	5869	1681	394	634	906	6753	12860	31533	-0.005
Years 91-95	Intercept	5016	1545	366	479	883	5582	10650	31543	-0.004
Years 96-00	Intercept	9544	1469	727	744	2166	10039	45751	41939	0.027
Years 01-05	Intercept	7885	1268	623	1088	1806	7653	43616	43033	0.016
Years 06-10	Intercept	8911	1592	733	1011	1342	10069	59016	52209	0.031
Years 82-85	Northeast	1666	370	38	-1102	47	-1238	211	6347	-0.052
Years 86-90	Northeast	3796	812	264	568	915	760	-686	39628	0.010
Years 91-95	Northeast	2779	796	176	193	1048	1439	1018	33131	-0.008
Years 96-00	Northeast	1787	588	40	112	237	545	4650	17536	-0.040
Years 01-05	Northeast	3026	608	165	-43	91	3032	3884	29517	0.000
Years 06-10	Northeast	2779	537	66	131	590	649	-10436	43646	-0.023
Years 82-85	South	960	-645	14	-953	157	-1664	437	3029	-0.046
Years 86-90	South	1580	-441	76	-61	186	627	30	7740	0.001
Years 91-95	South	1687	-224	90	134	79	944	1930	4376	-0.023
Years 96-00	South	-1406	71	-145	-41	-759	-242	1163	-5903	-0.054
Years 01-05	South	-1996	9	-173	-200	-426	-374	-1607	-4370	-0.033
Years 06-10	South	-2337	-392	-223	-274	-363	-2139	-6242	-308	-0.028
Years 82-85	West	3652	220	184	-748	701	201	2611	34398	-0.030
Years 86-90	West	5112	409	428	354	1151	1442	2579	39260	-0.045
Years 91-95	West	3661	790	317	452	1174	1184	5677	40633	-0.040
Years 96-00	West	1595	830	109	482	285	854	6948	40236	-0.064
Years 01-05	West	-388	1090	-5	142	296	1874	19212	66330	-0.020
Years 06-10	West	2467	235	161	544	1190	3006	2787	81099	-0.027
Years 82-85	Adults	7400	-52	431	245	968	865	-362	6092	0.245
Years 86-90	Adults	8359	51	572	271	1016	1466	351	7621	0.230
Years 91-95	Adults	8234	-27	588	256	899	1105	575	7369	0.225
Years 96-00	Adults	7983	52	575	272	696	348	-843	7579	0.213
Years 01-05	Adults	10379	285	705	227	684	1233	5800	13747	0.190
Years 06-10	Adults	9207	316	638	165	602	690	1659	12461	0.166
Years 82-85	kids	349	461	57	-400	-114	-2771	-4413	34	0.004
Years 86-90	kids	-277	501	26	-221	-252	-3010	-4522	-1819	0.006
Years 91-95	kids	601	566	106	-98	8	-2275	-3291	-477	-0.003
Years 96-00	kids	697	324	86	-136	-115	-2821	-16060	-1527	-0.001
Years 01-05	kids	688	44	82	-173	-194	-2880	-20767	-328	-0.016
Years 06-10	kids	1097	101	102	-143	-24	-2824	-27159	-1307	-0.029
Years 82-85	Permanent Inc	16226	-615	968	864	3948	3330	5468	16144	0.101
Years 86-90	Permanent Inc	16872	-559	1205	940	3684	4368	5204	18957	0.099
Years 91-95	Permanent Inc	16346	-378	1307	946	3632	3608	4064	18768	0.082
Years 96-00	Permanent Inc	20547	186	1384	1288	4191	7024	31279	27961	0.068
Years 01-05	Permanent Inc	22594	350	1421	1392	3870	7570	33400	43461	0.058
Years 06-10	Permanent Inc	22800	439	1432	1644	3769	9115	55264	44593	0.062
Years 82-85	Standard Dev	7969	2508	616	5956	5686	16833	22695	34950	
Years 86-90	Standard Dev	8617	3245	699	2694	4485	17252	21677	38150	
Years 91-95	Standard Dev	7166	2914	680	2359	4928	15042	21315	39100	
Years 96-00	Standard Dev	11068	3145	771	2756	4474	27354	135735	58010	
Years 01-05	Standard Dev	11566	3313	767	2976	5300	26449	202636	84053	
Years 06-10	Standard Dev	11277	2990	810	3193	5523	32548	223702	87621	

Table 1b – Parameter estimates of the Latent Trait model measuring Permanent Income

Indicator level	Covariate	Years 82-85	Years 86-90	Years 91-95	Years 96-00	Years 01-05	Years 06-10
Occupation (managerial, professional)	Intercept	0.48	0.30	0.17	0.64	0.79	0.66
Occupation (administ support, technical, sales, self-employed)	Intercept	0.32	0.66	0.54	0.77	0.61	0.42
Occupation (service, military)	Intercept	-0.63	-0.56	-0.43	-0.31	-0.27	-0.27
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	Intercept	-0.10	-0.17	-0.11	-0.07	-0.20	-0.28
Occupation (precision production, crafts, repair)	Intercept	-1.03	-1.08	-1.25	-1.42	-1.35	-1.31
Occupation (retired)	Intercept	1.07	1.10	1.11	1.01	1.03	1.08
Occupation (not working)	Intercept	-0.12	-0.26	-0.02	-0.64	-0.62	-0.29
Occupation (managerial, professional)	Northeast	0.10	0.22	0.14	0.14	0.04	0.17
Occupation (administ support, technical, sales, self-employed)	Northeast	-0.07	0.15	0.15	0.01	-0.02	-0.05
Occupation (service, military)	Northeast	0.17	0.15	0.22	0.07	0.12	0.22
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	Northeast	-0.32	-0.40	-0.45	-0.39	-0.51	-0.43
Occupation (precision production, crafts, repair)	Northeast	-0.06	-0.19	-0.26	-0.11	-0.06	-0.14
Occupation (retired)	Northeast	0.07	0.06	0.12	0.14	0.11	0.09
Occupation (not working)	Northeast	0.12	0.00	0.08	0.14	0.32	0.14
Occupation (managerial, professional)	South	0.31	0.26	0.31	-0.06	-0.04	-0.11
Occupation (administ support, technical, sales, self-employed)	South	0.03	0.07	0.25	0.05	-0.08	-0.07
Occupation (service, military)	South	0.10	0.35	0.05	-0.10	0.16	0.29
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	South	-0.32	-0.38	-0.34	-0.35	-0.43	-0.47
Occupation (precision production, crafts, repair)	South	0.15	-0.11	-0.11	0.08	-0.05	-0.10
Occupation (retired)	South	-0.23	-0.10	-0.09	0.02	0.01	0.11
Occupation (not working)	South	-0.04	-0.10	-0.08	0.35	0.43	0.35
Occupation (managerial, professional)	West	0.41	0.40	0.36	0.28	-0.06	0.18
Occupation (administ support, technical, sales, self-employed)	West	0.16	0.33	0.38	0.15	-0.01	0.10
Occupation (service, military)	West	0.19	0.21	0.26	0.03	0.13	0.27
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	West	-0.37	-0.33	-0.50	-0.53	-0.40	-0.52
Occupation (precision production, crafts, repair)	West	0.28	0.07	0.15	0.10	-0.02	-0.05
Occupation (retired)	West	-0.34	-0.27	-0.22	-0.09	0.07	-0.01
Occupation (not working)	West	-0.34	-0.41	-0.42	0.06	0.30	0.03
Occupation (managerial, professional)	Adults	0.01	0.02	0.05	-0.08	-0.08	-0.04
Occupation (administ support, technical, sales, self-employed)	Adults	0.12	0.06	-0.02	-0.12	0.00	0.02
Occupation (service, military)	Adults	0.01	-0.05	0.00	0.04	0.00	0.02
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	Adults	0.21	0.28	0.28	0.20	0.09	0.09
Occupation (precision production, crafts, repair)	Adults	0.27	0.32	0.36	0.31	0.24	0.15
Occupation (retired)	Adults	-0.22	-0.18	-0.16	-0.21	-0.24	-0.23
Occupation (not working)	Adults	-0.41	-0.45	-0.51	-0.14	0.00	-0.01
Occupation (managerial, professional)	kids	0.16	0.16	0.21	0.21	0.15	0.16
Occupation (administ support, technical, sales, self-employed)	kids	0.19	0.14	0.21	0.20	0.15	0.20
Occupation (service, military)	kids	0.23	0.25	0.24	0.27	0.25	0.20
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	kids	0.37	0.34	0.30	0.29	0.30	0.20
Occupation (precision production, crafts, repair)	kids	0.36	0.32	0.33	0.30	0.25	0.24
Occupation (retired)	kids	-1.45	-1.51	-1.53	-1.50	-1.39	-1.30
Occupation (not working)	kids	0.14	0.30	0.23	0.23	0.28	0.30
Occupation (managerial, professional)	Permanent Inc	1.31	1.37	1.32	1.38	1.20	1.16
Occupation (administ support, technical, sales, self-employed)	Permanent Inc	0.84	0.79	0.72	0.50	0.40	0.37
Occupation (service, military)	Permanent Inc	-0.33	-0.33	-0.10	-0.20	-0.29	-0.08
Occupation (operator, assembler, laborer, farming,fishing, groundskeepin)	Permanent Inc	0.20	0.22	0.07	-0.03	-0.21	-0.27
Occupation (precision production, crafts, repair)	Permanent Inc	0.56	0.50	0.55	0.52	0.28	0.09
Occupation (retired)	Permanent Inc	-0.94	-0.80	-0.79	-0.93	-0.76	-0.59
Occupation (not working)	Permanent Inc	-1.63	-1.75	-1.77	-1.25	-0.63	-0.69

Table 1c – Parameter estimates of the Latent Trait model measuring Permanent Income

Indicator level	Covariate	Years 82-85	Years 86-90	Years 91-95	Years 96-00	Years 01-05	Years 06-10
Education (8th grade or less)	Intercept	-0.48	-0.41	-0.63	-1.33	-1.46	-1.73
Education (incomplete HS)	Intercept	-0.03	-0.01	-0.15	-0.48	-0.57	-0.62
Education (complete HS)	Intercept	0.89	0.96	0.96	0.90	0.84	0.76
Education (some college)	Intercept	0.56	0.59	0.68	1.05	1.10	1.13
Education (complete college)	Intercept	-0.23	-0.29	-0.11	0.48	0.52	0.69
Education (graduate school)	Intercept	-0.70	-0.85	-0.75	-0.62	-0.44	-0.24
Education	Northeast	0.05	0.11	0.07	0.06	0.07	0.01
Education	South	0.07	0.10	0.08	-0.09	-0.08	-0.14
Education	West	0.24	0.27	0.25	0.16	0.06	0.09
Education	Adults	-0.06	-0.03	-0.03	-0.04	-0.01	-0.04
Education	kids	0.02	0.00	0.01	-0.02	-0.04	-0.03
Education	Permanent Inc	0.51	0.52	0.50	0.61	0.60	0.57
Dwelling (Rented or occupied without pa	Intercept	0.98	0.86	0.80	0.73	0.50	0.53
Dwelling (Owned with mortgage)	Intercept	-0.90	-0.94	-0.84	-0.68	-0.47	-0.39
Dwelling (Fully owned)	Intercept	-0.08	0.08	0.04	-0.05	-0.03	-0.14
Dwelling (Rented or occupied without pa	Northeast	0.35	0.38	0.38	0.27	0.25	0.22
Dwelling (Owned with mortgage)	Northeast	-0.18	-0.10	-0.15	-0.18	-0.20	-0.17
Dwelling (Fully owned)	Northeast	-0.17	-0.28	-0.23	-0.09	-0.04	-0.05
Dwelling (Rented or occupied without pa	South	0.25	0.21	0.22	0.05	0.10	0.09
Dwelling (Owned with mortgage)	South	0.03	0.07	0.04	-0.05	-0.10	-0.14
Dwelling (Fully owned)	South	-0.27	-0.29	-0.26	0.00	0.00	0.04
Dwelling (Rented or occupied without pa	West	0.42	0.47	0.46	0.34	0.40	0.34
Dwelling (Owned with mortgage)	West	0.12	0.18	0.13	0.00	-0.07	-0.02
Dwelling (Fully owned)	West	-0.54	-0.65	-0.59	-0.35	-0.33	-0.32
Dwelling (Rented or occupied without pa	Adults	-0.56	-0.55	-0.56	-0.49	-0.44	-0.44
Dwelling (Owned with mortgage)	Adults	0.42	0.45	0.41	0.40	0.36	0.32
Dwelling (Fully owned)	Adults	0.15	0.09	0.15	0.09	0.08	0.11
Dwelling (Rented or occupied without pa	kids	0.19	0.21	0.23	0.17	0.19	0.19
Dwelling (Owned with mortgage)	kids	0.36	0.30	0.31	0.27	0.27	0.25
Dwelling (Fully owned)	kids	-0.55	-0.51	-0.53	-0.44	-0.47	-0.44
Dwelling (Rented or occupied without pa	Permanent Inc	-0.32	-0.39	-0.45	-0.40	-0.56	-0.59
Dwelling (Owned with mortgage)	Permanent Inc	0.66	0.74	0.70	0.69	0.69	0.63
Dwelling (Fully owned)	Permanent Inc	-0.34	-0.35	-0.25	-0.29	-0.13	-0.05

Table 3 – Average Annual Consumption Budget by Socioeconomic Stratum from 1982 to 2010

Period	Annual Budget (2010 prices)			Adjusted for geodemography (2010 prices)					
	Upper quartile	Median quartiles	Lower quartile	Upper quartile	% change	Median quartiles	% change	Lower quartile	% change
1982-85	\$41,697	\$27,254	\$20,321	\$40,886		\$28,481		\$19,892	
1986-90	\$44,972	\$27,890	\$20,117	\$44,955	10.0%	\$29,680	4.2%	\$19,084	-4.1%
1991-95	\$44,009	\$26,504	\$19,744	\$43,899	-2.3%	\$28,615	-3.6%	\$18,757	-1.7%
1996-00	\$44,671	\$27,167	\$19,716	\$44,817	2.1%	\$28,727	0.4%	\$18,781	0.1%
2001-05	\$45,987	\$27,433	\$20,365	\$46,078	2.8%	\$29,413	2.4%	\$19,002	1.2%
2006-10	\$48,488	\$28,165	\$21,008	\$48,894	6.1%	\$30,102	2.3%	\$19,506	2.7%

Table 4 – Policy simulations

		Upper quartile						Middle quartiles						Lower quartile					
		82-85	86-90	91-95	96-00	02-05	06-10	82-85	86-90	91-95	96-00	02-05	06-10	82-85	86-90	91-95	96-00	02-05	06-10
Observed	Food & Beverages	24%	24%	22%	21%	20%	21%	26%	25%	25%	24%	23%	23%	28%	29%	28%	27%	26%	27%
	Personal Care	14%	15%	14%	12%	10%	9%	12%	11%	11%	10%	8%	7%	10%	10%	9%	8%	7%	6%
	Medical	5%	6%	7%	7%	7%	8%	7%	7%	9%	8%	9%	10%	8%	10%	10%	10%	10%	9%
	Transportation	15%	14%	15%	15%	15%	14%	15%	14%	14%	15%	15%	15%	14%	11%	12%	12%	12%	13%
	Other Expenses	17%	19%	20%	21%	24%	23%	12%	13%	14%	15%	16%	15%	9%	8%	8%	10%	10%	11%
	Housing	24%	23%	22%	23%	24%	26%	29%	29%	28%	28%	29%	31%	31%	32%	33%	33%	34%	36%
Actual Budget	Food & Beverages	21%	21%	20%	20%	20%	21%	23%	23%	22%	23%	23%	25%	26%	27%	26%	26%	27%	28%
	Personal Care	13%	13%	12%	10%	8%	6%	11%	11%	10%	8%	7%	5%	9%	8%	7%	7%	5%	4%
	Medical	6%	8%	10%	11%	11%	12%	7%	8%	10%	11%	11%	11%	6%	7%	9%	10%	10%	9%
	Transportation	13%	12%	14%	14%	14%	15%	12%	12%	13%	13%	14%	15%	10%	9%	10%	11%	11%	12%
	Other Expenses	13%	14%	15%	15%	15%	13%	9%	10%	10%	11%	10%	9%	7%	6%	7%	7%	7%	6%
	Housing	34%	32%	30%	29%	33%	33%	38%	37%	34%	34%	35%	36%	42%	42%	41%	39%	41%	41%
Fixed budget	Food & Beverages	21%	21%	20%	20%	19%	20%	23%	23%	23%	22%	22%	22%	27%	27%	26%	25%	24%	24%
	Personal Care	13%	14%	13%	11%	10%	8%	11%	11%	10%	10%	8%	7%	9%	9%	8%	8%	7%	5%
	Medical	9%	9%	11%	11%	10%	11%	9%	9%	10%	11%	10%	10%	7%	8%	8%	9%	8%	8%
	Transportation	13%	13%	13%	14%	14%	14%	13%	12%	13%	13%	13%	14%	10%	9%	10%	10%	11%	12%
	Other Expenses	13%	13%	14%	14%	14%	13%	9%	9%	10%	10%	10%	9%	6%	6%	6%	7%	7%	7%
	Housing	34%	33%	32%	33%	36%	37%	38%	37%	37%	37%	39%	40%	42%	42%	43%	43%	44%	45%

Figure 1 – Profile of the Socio-Economic Classes (Income and Assets)

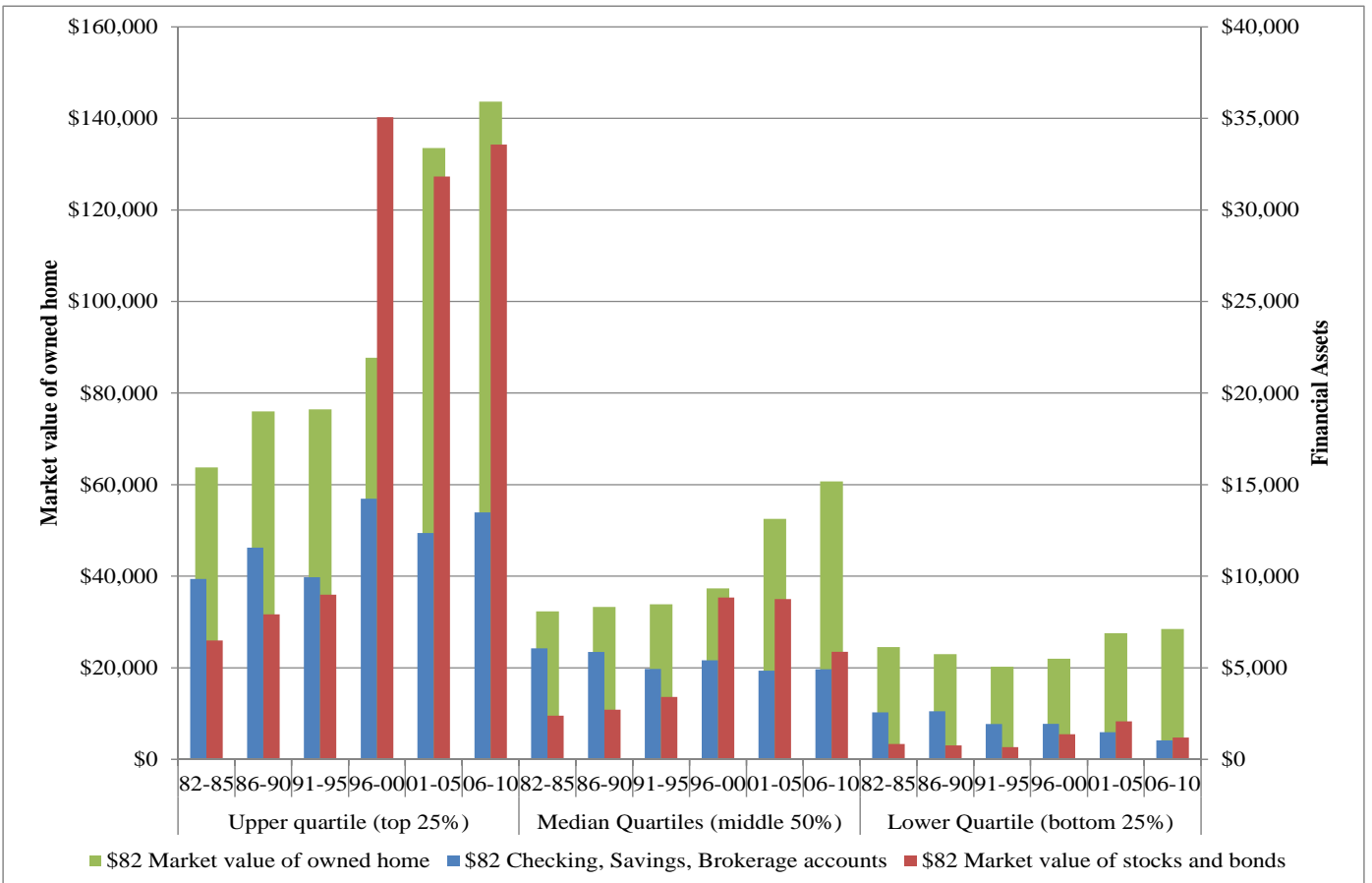
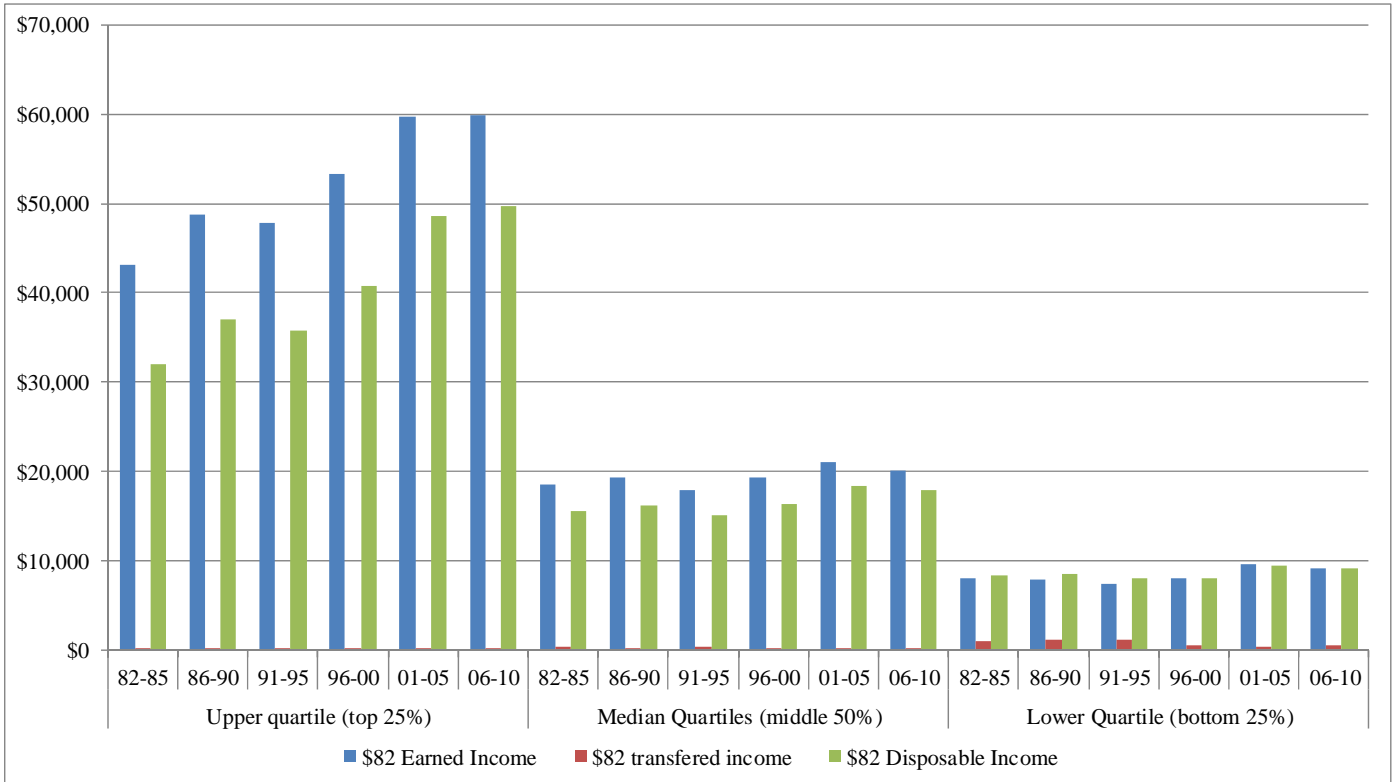


Figure 2 – Average Annual Expenditures for Selected Categories at Constant (2010) Prices

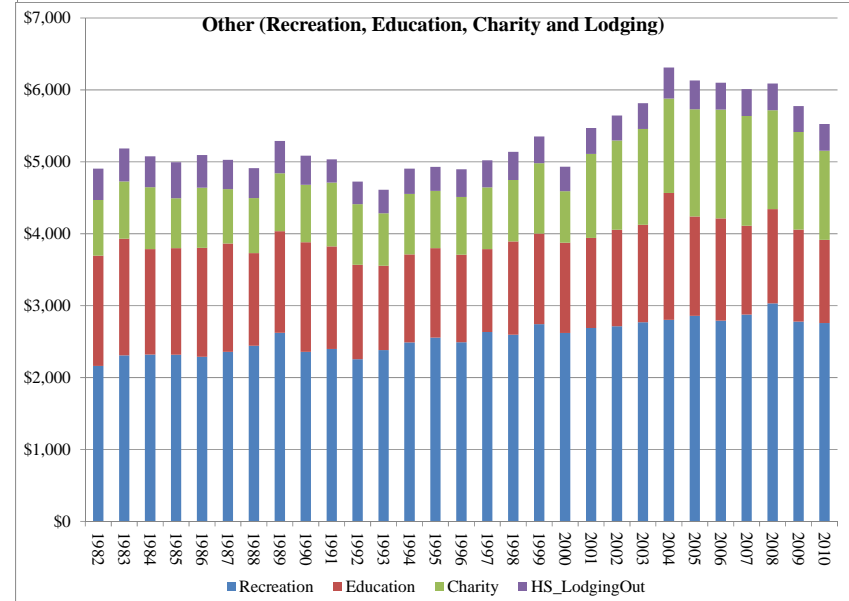
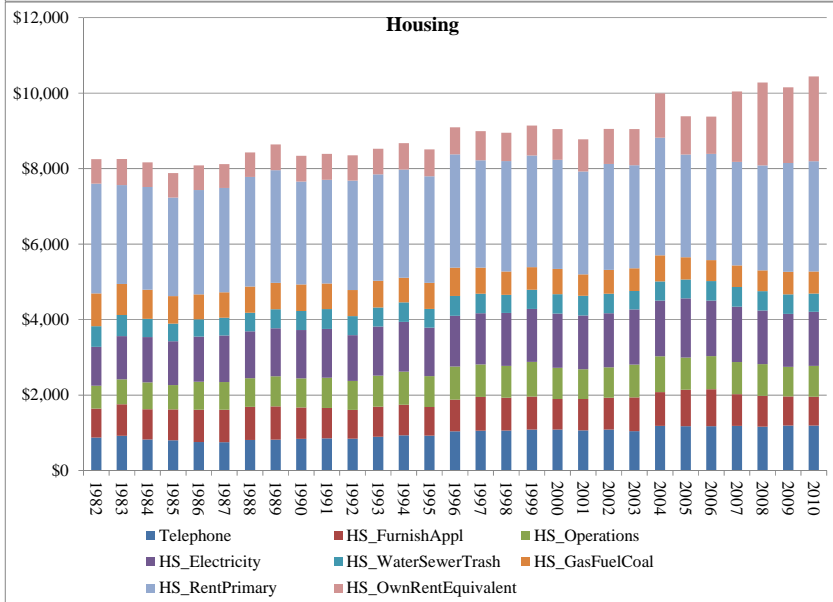
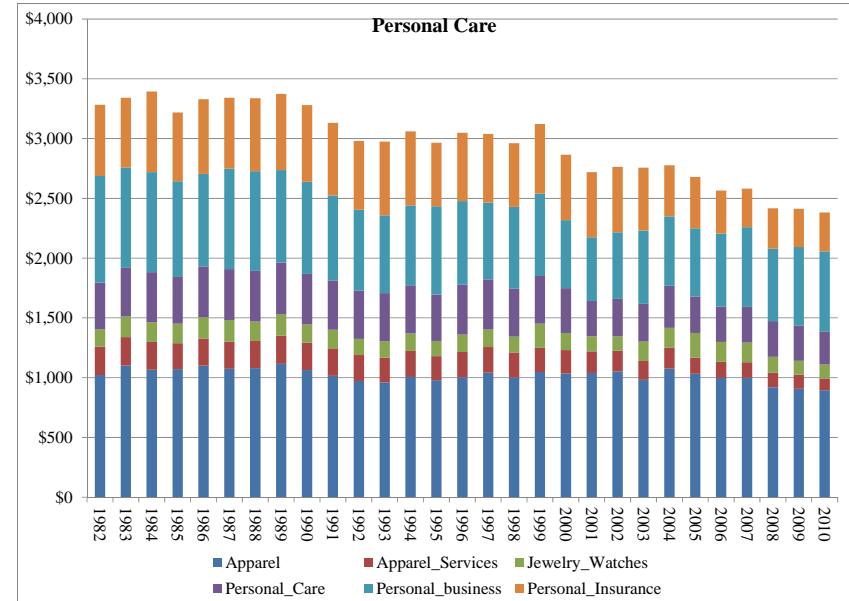
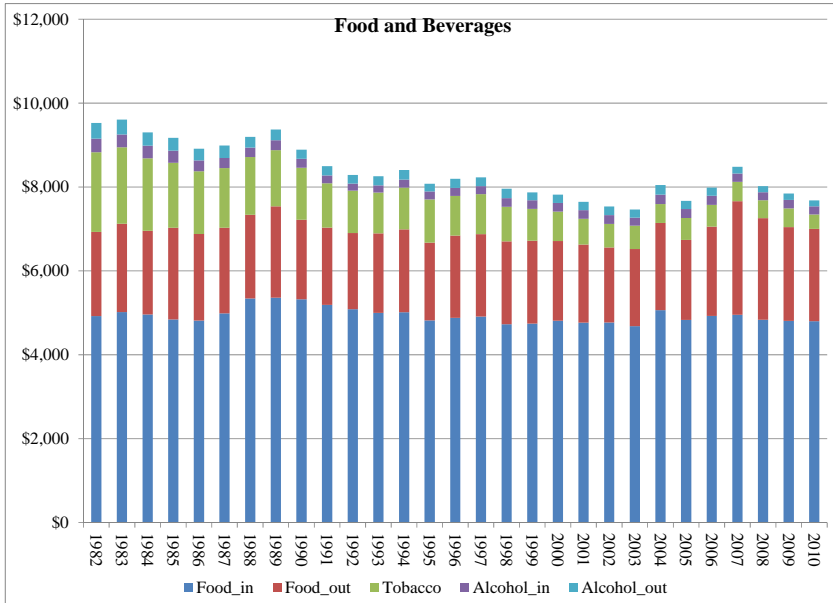


Figure 3 – Price indices for selected categories

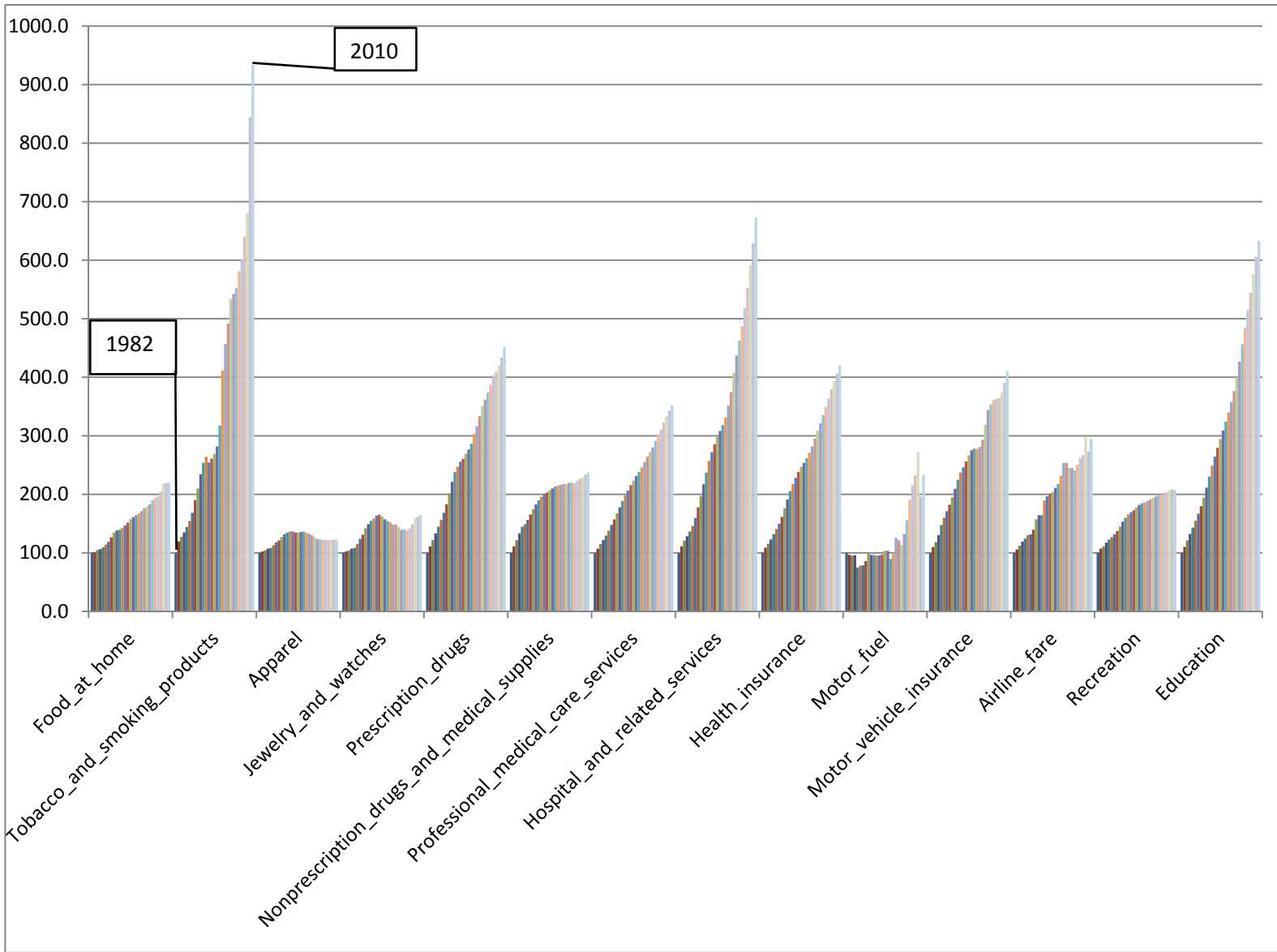


Figure 4a – Expenditure by Consumption Category and Socioeconomic Class (2010 prices)

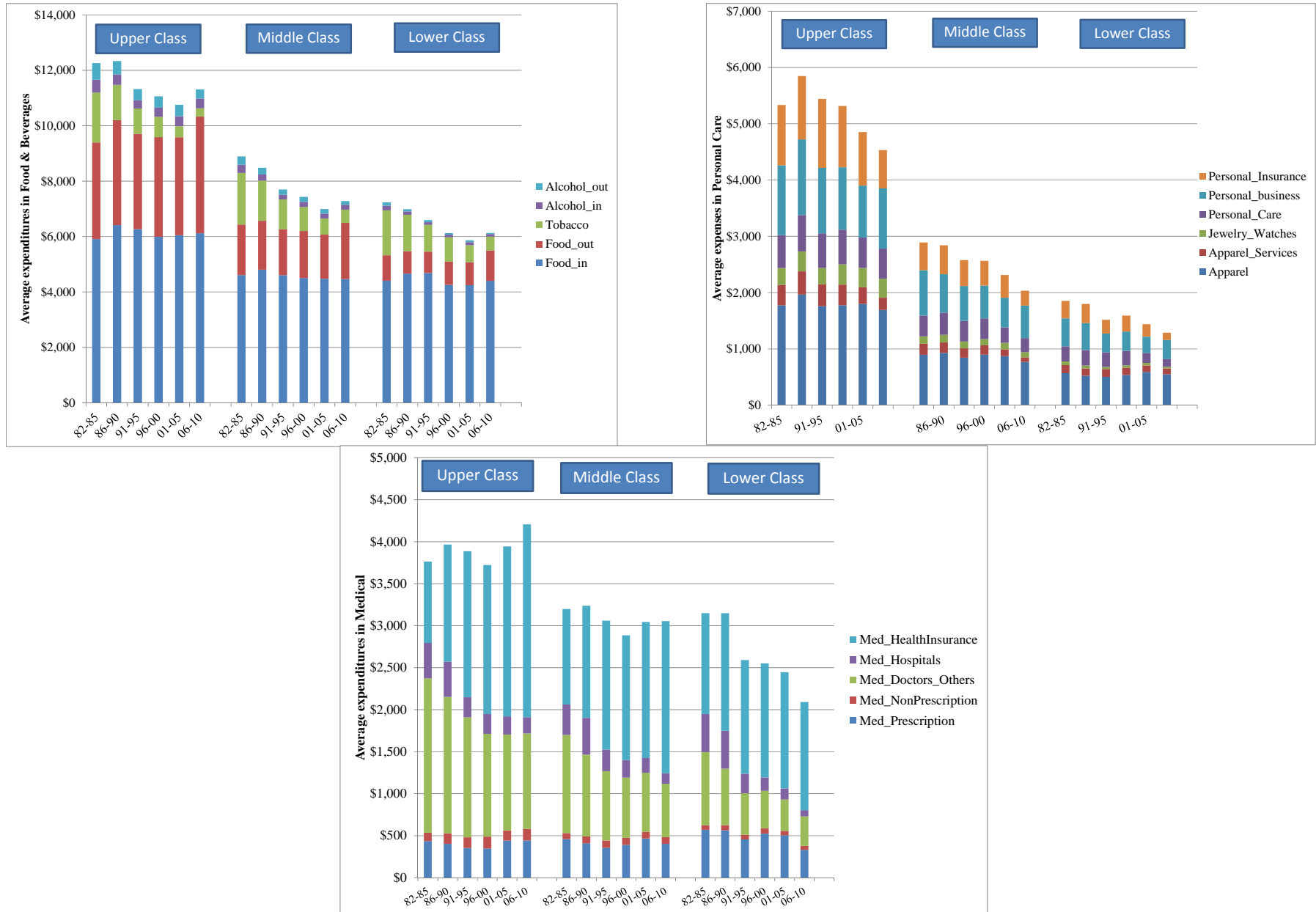


Figure 4b – Expenditure by Consumption Category and Socioeconomic Class (2010 prices)

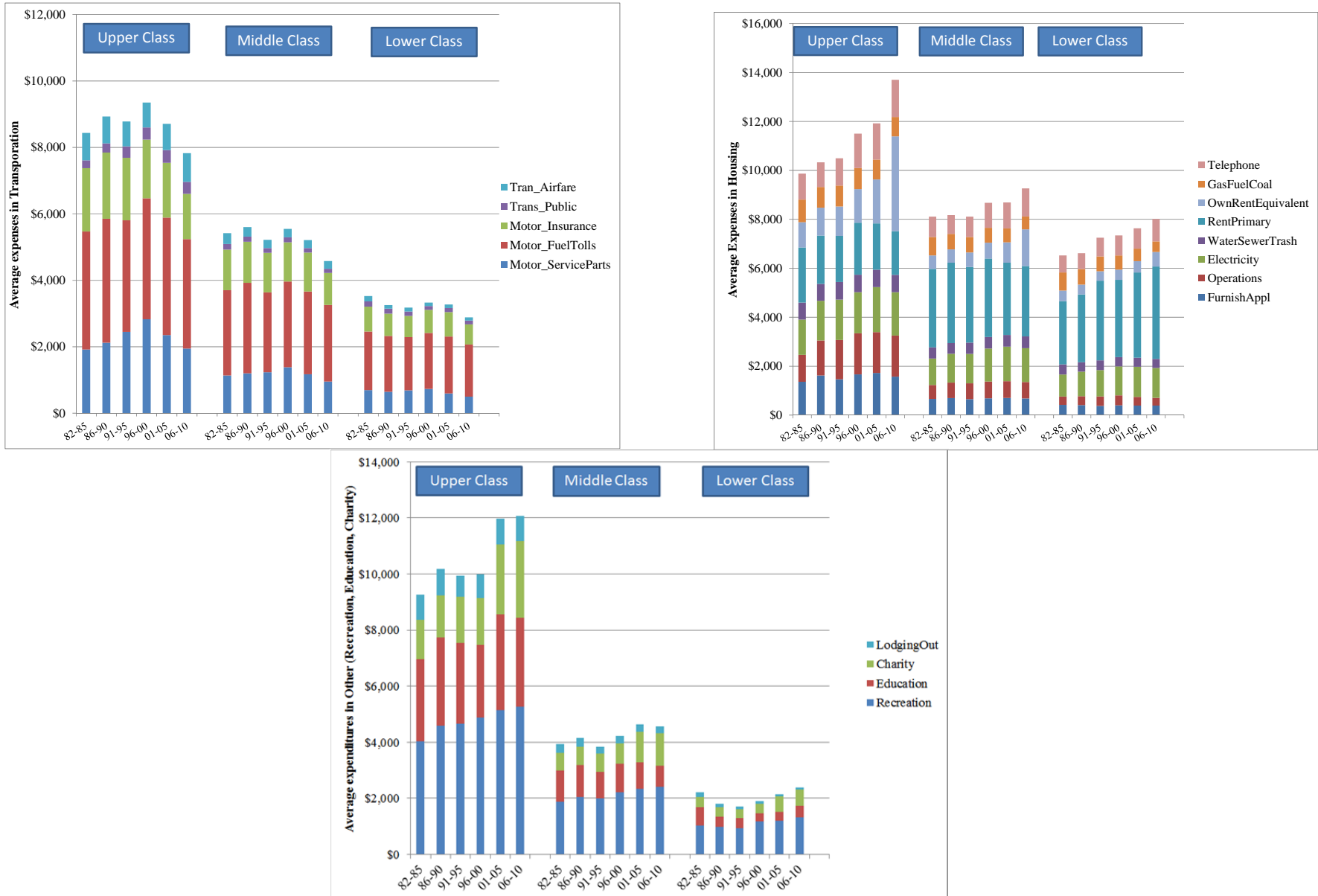


Figure 5 – Disparities in Consumption Between the Upper and Lower Quartiles of Permanent Income

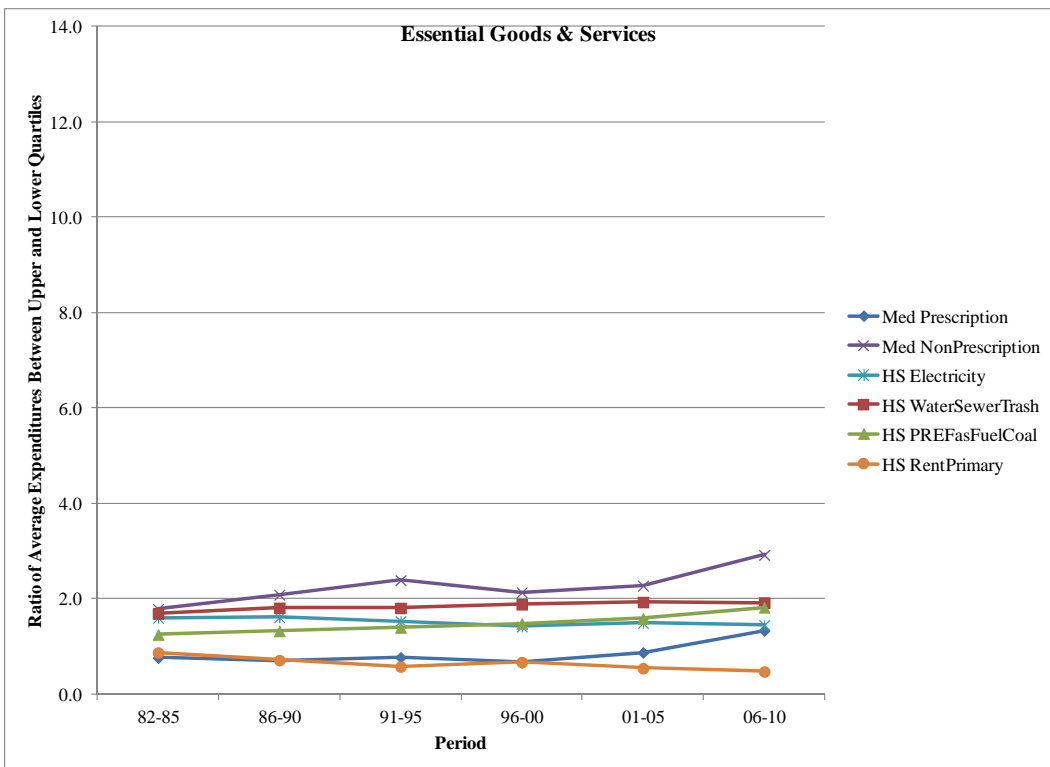
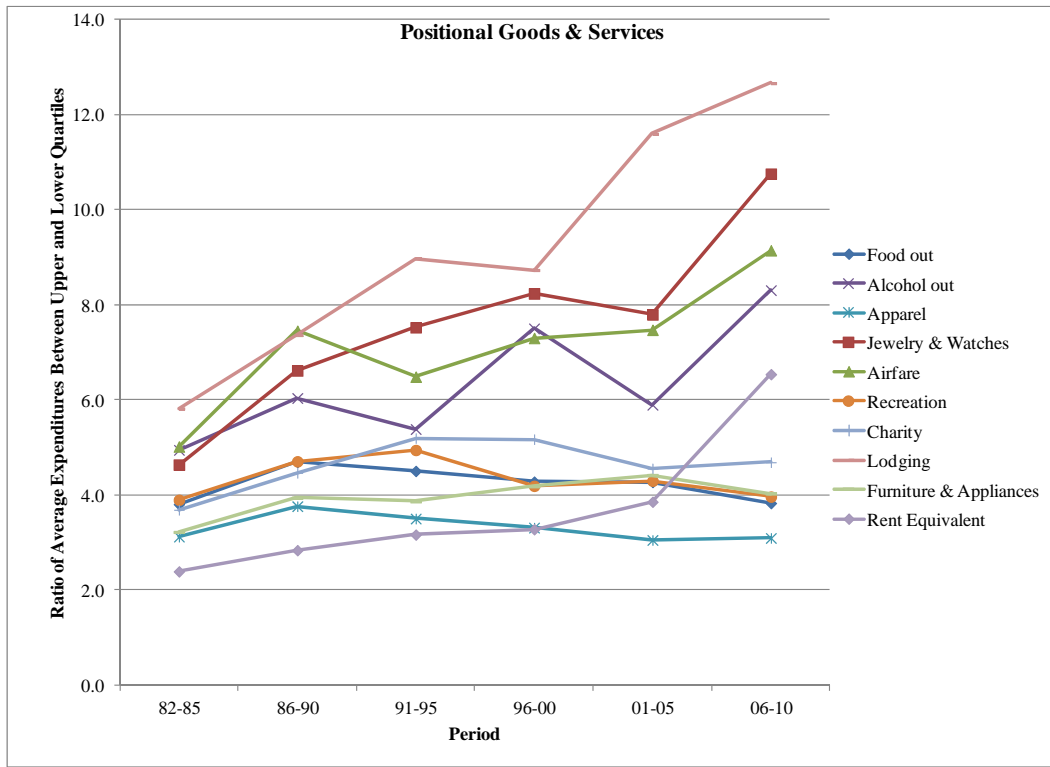


Figure 6a – Engel Curves by Class (2006-2010)

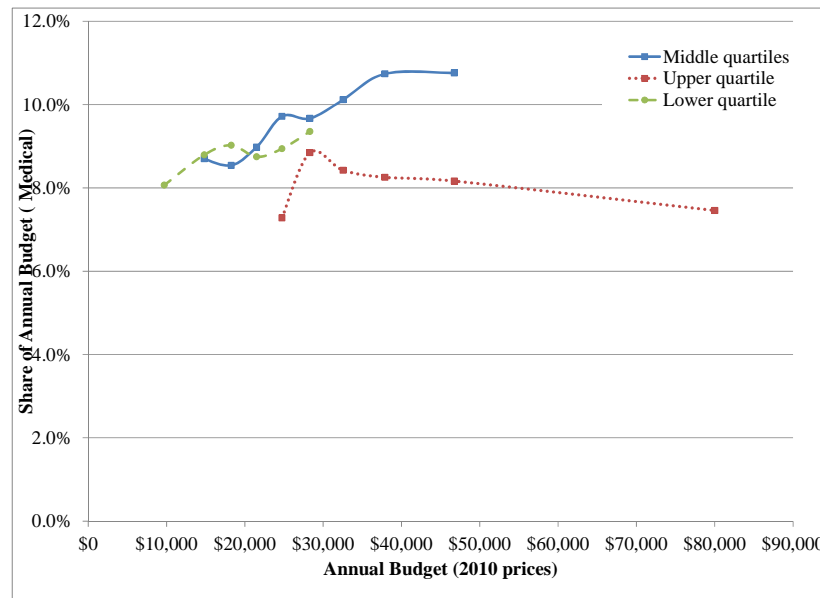
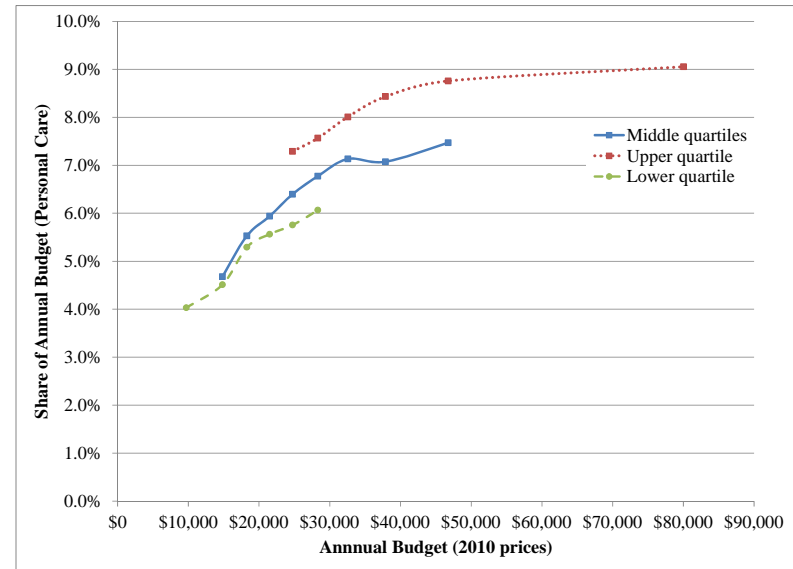
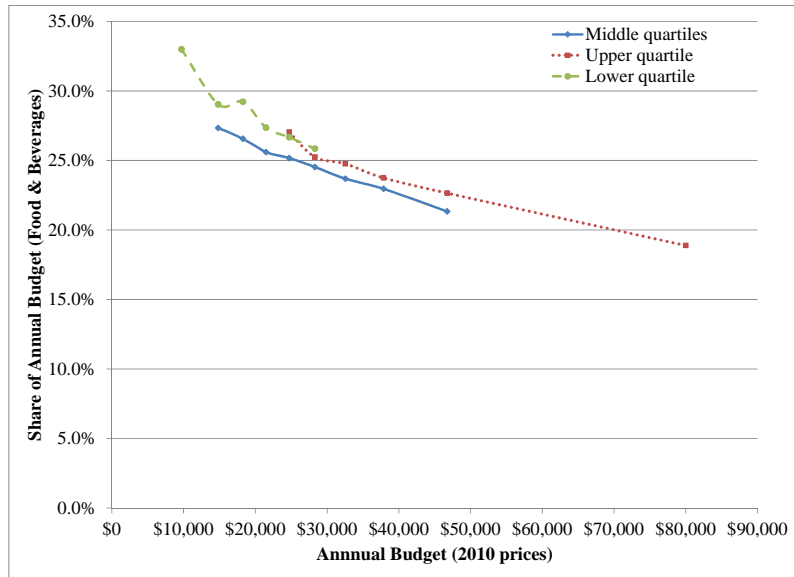


Figure 6b – Engel Curves by Class (2006-2010)

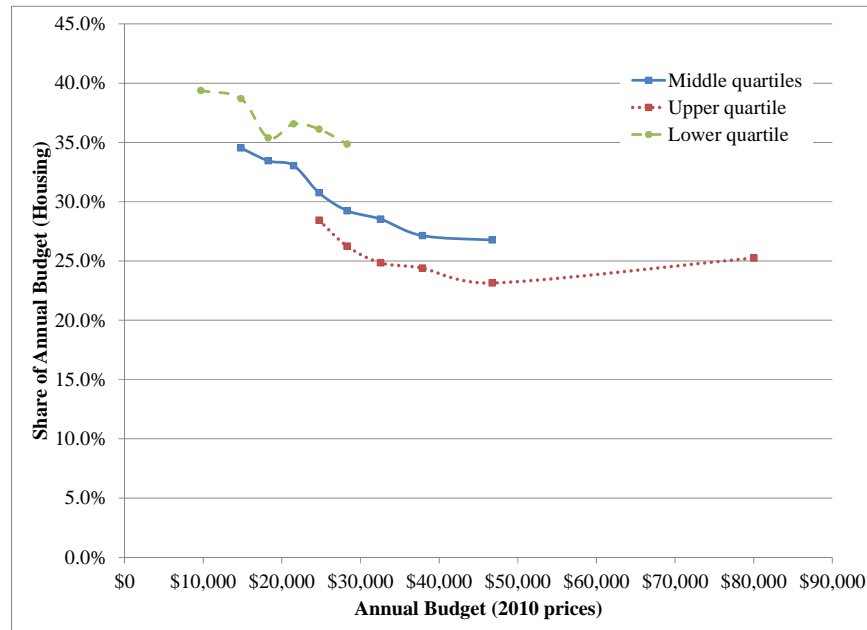
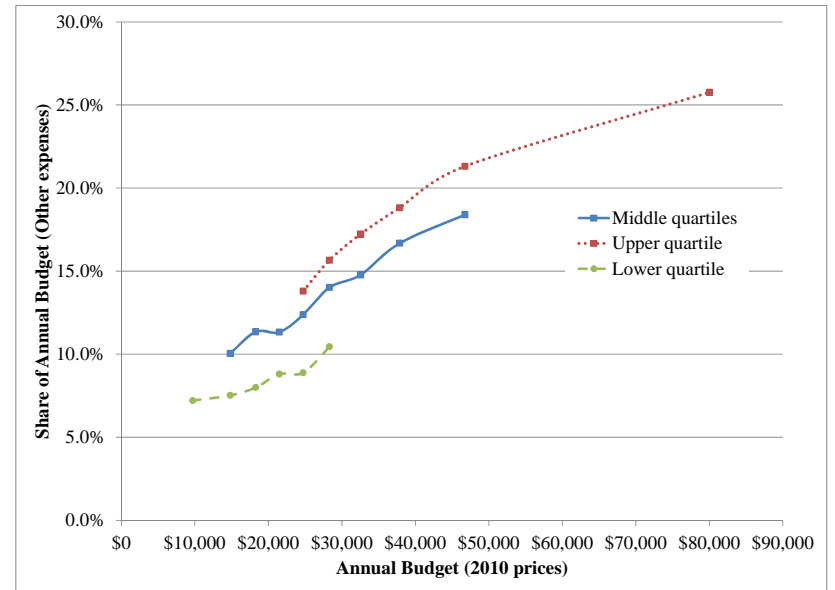
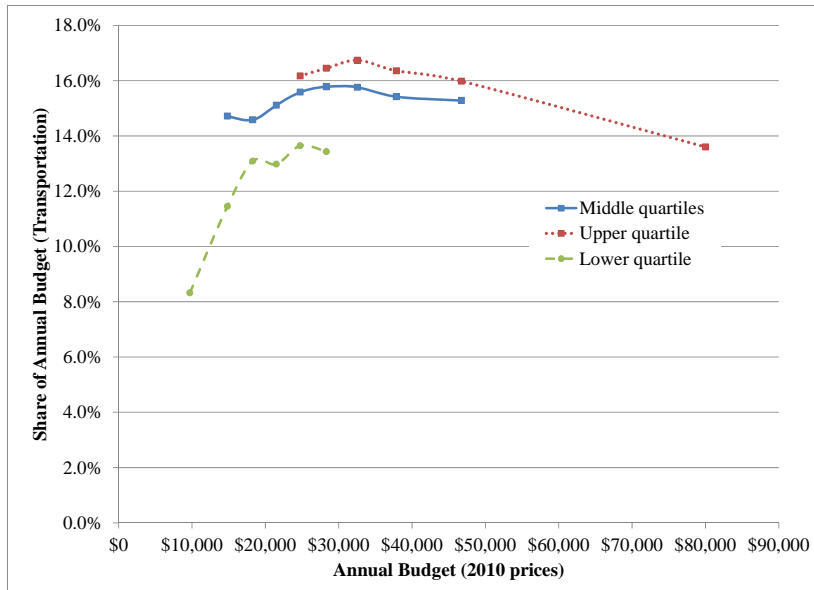


Figure 7a – Estimated Initial (q=0) Consumption Priorities by Class

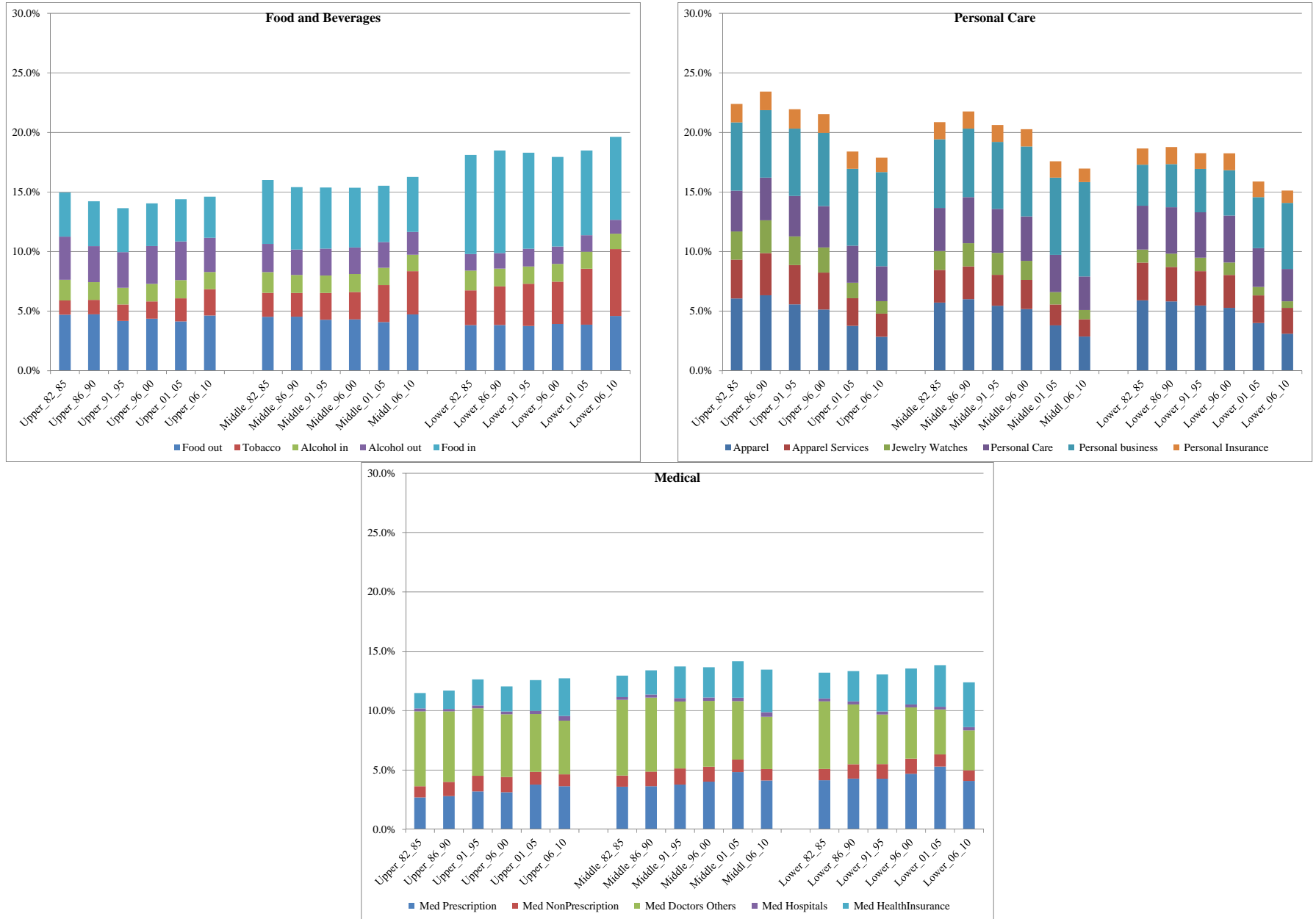
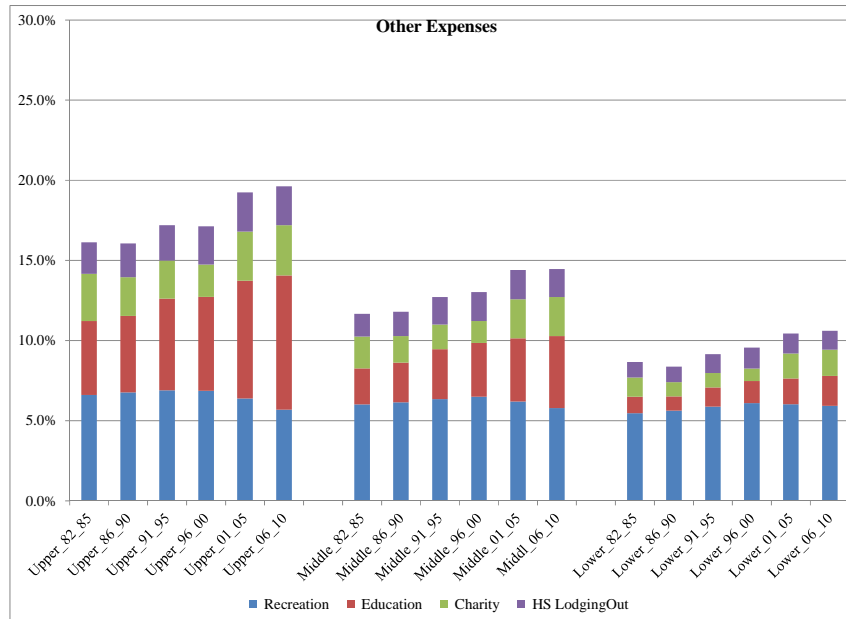
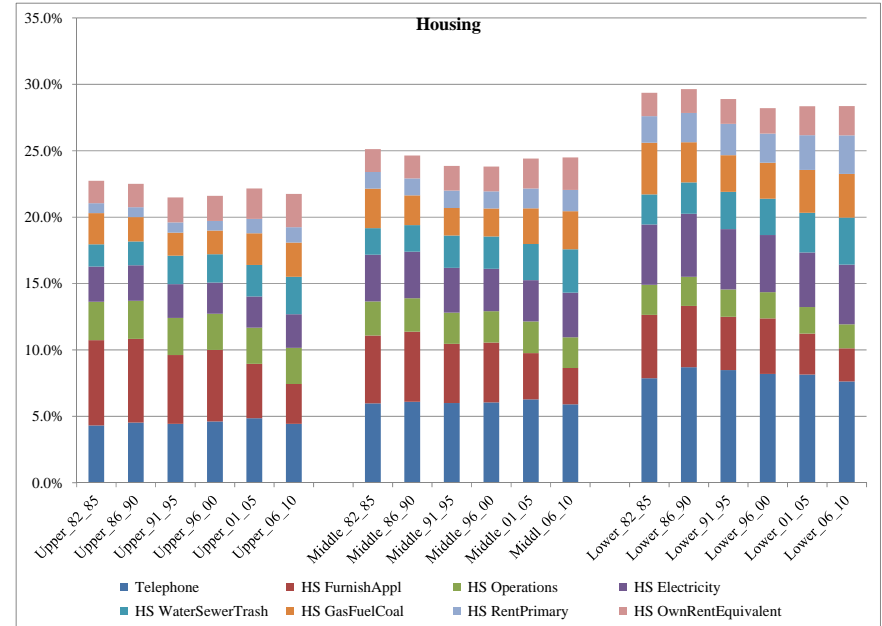
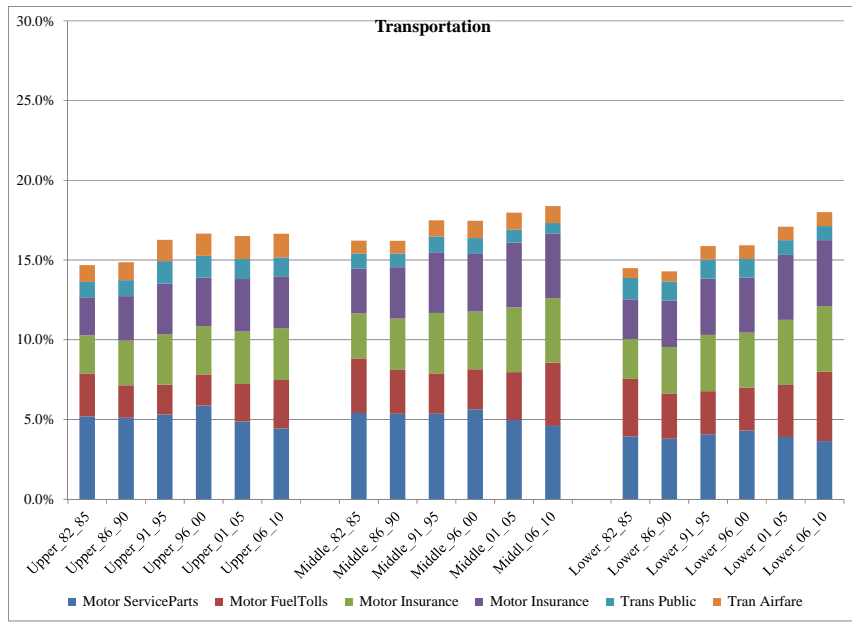


Figure 7b – Estimated Initial (q=0) Consumption Priorities by Class



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APPENDIX

Table A1 - Indicators of Permanent Income found in the Consumer Expenditure Survey

- **Income(at 1982 prices)** – Wages & salaries, Proprietor’s Profit, Farm Profit, Rental Profit, Dividends Received, Interest Received, Pensions & Annuities, Social Security & Railroad Retirement Income
- **Income Supplements(at 1982 prices)** – Supplemental security income, Unemployment Compensation, Workers' Compensation and Veterans Benefits Including Education, Public Assistance or Welfare Including Money Received From Job Training Grants Such as Job Corps, Other Income Including Money Received from Care of Foster Children, Cash Scholarships and Fellowships or Stipends not Based on Working, Food Stamps
- **Retirement Deductions(at 1982 prices)** - Deductions for Social Security and other government retirement (includes Medicare), Overpayment on Social Security (includes Medicare)
- **Private Pension Deductions(at 1982 prices)** - Deductions For Private Pensions, Non-Payroll Deposit to Individual Retirement Plan
- **Taxes(at 1982 prices)** - Federal Income Tax, Federal Income Tax Refunds, State and Local Income Tax, State and Local Income Tax Refunds, Personal Property Taxes, Amount for Special Assessments for Roads, Streets, or Similar Purposes not Included in Property Tax - Owned Home and Vacation Home, Special Assessments for Services and Capital Improvements - Other Properties, Other Taxes and Tax Refunds, State and Local Vehicle Registration, Driver's License
- **Cash(at 1982 prices)** - Market Value of Checking Accounts, Brokerage Accounts and Other Similar Accounts, Savings Accounts
- **Securities(at 1982 prices)** - Market Value of U.S. Savings Bonds, Stocks, Bonds, Mutual Funds, and Other Such Securities, Investments to Farm or Business
- **Home Value(at 1982 prices)** - Market Value of Owned Homes
- **Number of Autos** - Number of owned automobiles
- **Education**- head of household or reference person: eighth grade or less, incomplete HS, complete HS, some college, complete college, graduate school.
- **Dwelling**: Rented or occupied without pay, Owned with mortgage, Fully owned
- **Occupation** - head of household or reference person:
 - managerial, professional
 - administrative support, technical, sales, self-employed
 - service, military
 - operator, assembler, laborer, farming, fishing, grounds keeping
 - precision production, craft, repair
 - Retired
 - Not working (unemployed, student, not in the workforce)

Table A3 – Expenditure categories and respective price indices

Category	Description	Price index
Food_in	Food Off-Premise	food at home
Food_out	Food On-Premise, Furnished by employers	food away from home
Tobacco	Tobacco Products	tobacco and smoking products
Alcohol_in	Alcohol Off-Premise	alcoholic beverages at home
Alcohol_out	Alcohol On-Premise	alcoholic beverages away from home
Apparel	Clothing and Shoes	apparel
Apparel_Services	Clothing Services	apparel services other than laundry and dry cleaning
Jewelry_Watches	Jewelry and Watches	jewelry and watches
Personal_Care	Toilet Articles and Preparations, barbershops, beauty parlors, health clubs	personal care services
Personal_business	Business Services	miscellaneous personal services
Personal_Insurance	Life Insurance	Purchasing power of the consumer dollar
Med_Prescription	Drug Preparations	prescription drugs and medical supplies
Med_NonPrescription	Ophthalmic Products and Orthopedic Appliances	nonprescription medical equipment and supplies
Med_Doctors_Others	Physicians, Dentists, Other Medical Professionals	professional medical care services
Med_Hospitals	Hospitals, Nursing homes	hospital and related services
Med_HealthInsurance	Health Insurance	health insurance
Motor_ServiceParts	Tires, Tubes, Accessories, and Other Parts, Repair, Greasing, Washing, Parking, Storage, Rental	Motor vehicle maintenance and repair
Motor_FuelTolls	Gasoline, Oil, Bridge, Tunnel, Ferry, and Road Tolls	motor fuel
Motor_Insurance	Auto Insurance	motor vehicle insurance
Trans_Public	Mass transit, Taxicab, Railway, Bus, and Other Travel Expenses	intracity transportation
Tran_Airfare	Airline Fares	airline fare
Recreation	Magazines, Newspapers, Other Nondurable Toys, books, Maps, Recreation & Sports equipment, Other recreation services	recreation
Education	Nursery, Elementary, and Secondary Education, Higher education, Other education services	tuition and fees
Charity	Religious and Welfare Activities	Purchasing power of the consumer dollar
HS_LodgingOut	Other Rented Lodging	other lodging away from home including hotels and motels
Telephone	Telephone, Wireless	land-line telephone services, local charges
HS_FurnishAppl	Furniture and Durable Household Equipment	household furnishings and operations
HS_Operations	Domestic Service, Other Household Operation, Equipment and Non-durable supplies	Household operations
HS_Electricity	Electricity	electricity
HS_WaterSewerTrash	Water and Other Sanitary Services	water and sewerage maintenance
HS_GasFuelCoal	Gas, Fuel Oil and Coal	fuel oils and other fuels
HS_RentPrimary	Tenant-Occupied Nonfarm Dwellings--Rent	rent of primary residence
HS_OwnRentEquivalent	Rental Equivalence of Owned Home	rent of primary residence

Table A4 – Budget Allocation Model Fit

Category	Incidence	Hit-Ratio	R-squared
Food in	100%	100%	31%
Food out	94%	94%	65%
Tobacco	38%	37%	14%
Alcohol in	53%	53%	16%
Alcohol out	51%	52%	15%
Apparel	95%	95%	59%
Apparel Services	65%	65%	49%
Jewelry Watches	43%	44%	23%
Personal Care	87%	88%	53%
Personal business	77%	79%	26%
Personal Insurance	50%	53%	34%
Med Prescription	71%	73%	25%
Med NonPrescription	30%	32%	20%
Med Doctors Others	77%	79%	28%
Med Hospitals	15%	16%	5%
Med HealthInsurance	70%	73%	46%
Motor ServiceParts	87%	88%	46%
Motor FuelTolls	93%	94%	59%
Motor Insurance	77%	79%	43%
Trans Public	36%	37%	35%
Tran Airfare	30%	32%	52%
Recreation	98%	98%	61%
Education	35%	35%	37%
Charity	63%	66%	48%
Telephone	98%	99%	51%
LodgingOut	45%	47%	60%
FurnishAppl	84%	84%	41%
Operations	77%	80%	55%
Electricity	95%	96%	57%
WaterSewerTrash	68%	73%	47%
GasFuelCoal	71%	74%	45%
RentPrimary	41%	34%	48%
OwnRentEquivalent	66%	73%	48%

Table A5a – Parameter estimates for the budget allocation model (Demographics)

	<i>Intcpt</i>	<i>Northeast</i>	<i>South</i>	<i>West</i>	<i>ADULTS</i>	<i>kids</i>	<i>Age_31_40</i>	<i>Age_41_50</i>	<i>Age_51_60</i>	<i>Age_61_70</i>	<i>Age_71plus</i>	<i>Black</i>	<i>OtherRace</i>	<i>Male</i>	<i>stdload1</i>	<i>stdload2</i>	<i>stdload3</i>	<i>stdload4</i>	<i>stdload5</i>	<i>stdload6</i>	<i>Beta</i>	<i>Std Dev</i>
Food in	-0.67	-0.06	-0.04	0.00	0.01	-0.11	-0.08	-0.13	-0.22	-0.22	-0.31	-0.25	-0.04	0.12	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	0.00
Food out	-2.17	-0.12	-0.08	-0.21	0.05	-0.11	0.02	0.02	-0.02	-0.24	-0.62	-0.10	-0.15	0.07	0.64	0.32	-0.55	-0.35	0.27	-0.02	-0.01	0.49
Tobacco	-2.49	0.07	-0.12	0.13	0.02	-0.17	-0.12	-0.27	-0.39	-0.47	-0.67	-0.20	-0.31	0.24	0.00	0.93	-0.34	0.02	0.15	0.03	-0.01	0.75
Alcohol in	-2.84	0.09	-0.36	0.13	0.01	-0.30	-0.28	-0.55	-0.78	-0.86	-1.23	-0.57	-0.43	0.26	0.35	0.91	-0.16	-0.15	0.05	0.01	-0.01	0.64
Alcohol out	-0.79	0.03	-0.07	0.00	0.05	0.02	-0.12	-0.18	-0.24	-0.25	-0.40	-0.01	-0.10	-0.11	0.56	0.79	-0.15	-0.19	0.05	-0.02	0.00	0.85
Apparel	-3.10	0.24	0.06	0.22	-0.07	-0.15	-0.22	-0.30	-0.38	-0.46	-0.58	0.48	0.04	0.03	0.61	0.19	-0.37	-0.54	0.41	0.02	-0.01	0.45
Apparel Services	-3.87	-0.01	-0.11	0.10	0.19	-0.07	-0.09	-0.16	-0.29	-0.30	-0.64	-0.38	-0.18	-0.05	0.73	0.22	-0.11	-0.37	0.25	0.45	0.00	0.95
Jewelry Watches	-2.46	0.03	-0.02	0.04	0.05	-0.08	-0.02	-0.05	-0.04	0.07	0.19	0.09	-0.10	-0.06	0.56	0.24	-0.23	-0.61	0.45	0.02	0.00	1.21
Personal Care	-3.06	-0.15	-0.20	0.11	0.09	-0.10	0.14	0.14	0.12	0.05	-0.11	-0.35	-0.08	0.04	0.61	0.19	-0.52	-0.37	0.43	-0.02	0.00	0.55
Personal business	-2.26	-0.12	-0.03	-0.17	0.11	-0.03	0.17	0.25	0.35	0.42	0.32	0.16	-0.05	0.08	0.41	0.30	-0.62	-0.25	0.52	-0.12	0.00	1.08
Personal Insurance	-4.26	-0.35	-0.05	-0.35	0.12	-0.07	0.19	0.33	0.64	1.10	1.59	-0.51	-0.38	-0.11	0.34	0.15	-0.63	-0.17	0.65	-0.13	-0.01	0.73
Med Prescription	-3.68	-0.14	-0.16	-0.04	0.08	-0.05	0.02	0.17	0.19	0.30	0.43	-0.38	-0.14	-0.03	0.11	0.02	-0.32	-0.10	0.94	-0.05	0.00	1.10
Med NonPrescription	-2.62	-0.11	-0.07	0.00	0.11	-0.01	0.16	0.24	0.34	0.55	0.70	-0.67	-0.33	-0.04	0.45	0.13	-0.40	-0.28	0.73	0.01	-0.01	0.80
Med Doctors Others	-6.50	-0.47	-0.06	-0.14	0.27	0.14	-0.04	-0.08	0.13	0.29	0.45	-0.73	-0.67	0.07	0.28	0.09	-0.32	-0.21	0.87	-0.09	0.00	0.93
Med Hospitals	-1.85	-0.13	-0.02	-0.10	0.02	-0.08	0.08	0.11	0.16	0.57	0.95	-0.17	-0.02	-0.02	0.10	0.10	-0.17	-0.07	0.97	-0.02	0.00	2.08
Med HealthInsurance	-1.92	-0.11	-0.10	0.11	0.14	-0.09	-0.03	-0.04	-0.08	-0.06	-0.24	-0.32	-0.21	0.16	0.30	0.09	-0.67	0.11	0.66	-0.08	-0.02	0.57
Motor ServiceParts	-0.78	-0.20	-0.02	-0.07	0.10	-0.07	-0.05	-0.09	-0.13	-0.17	-0.34	-0.18	-0.14	0.12	0.24	0.23	-0.80	-0.42	0.28	0.02	-0.01	0.76
Motor FuelTolls	-1.49	-0.05	-0.02	0.02	0.09	-0.10	-0.02	-0.03	-0.07	-0.05	-0.08	-0.19	-0.09	0.05	0.07	0.21	-0.91	-0.31	0.17	-0.02	-0.03	0.35
Motor Insurance	-4.63	0.73	-0.22	0.54	0.01	-0.16	-0.09	-0.02	-0.06	-0.02	-0.17	0.75	0.53	-0.21	0.18	0.19	-0.88	-0.23	0.33	-0.01	-0.02	0.42
Trans Public	-2.22	0.08	-0.09	0.35	0.04	-0.14	-0.06	-0.08	-0.09	0.03	-0.01	-0.20	0.18	-0.04	0.96	0.13	0.20	0.09	0.07	0.08	0.00	1.30
Tran Airfare	-0.38	-0.02	-0.11	0.04	0.00	-0.06	-0.04	-0.09	-0.16	-0.15	-0.27	-0.29	-0.16	0.04	0.92	0.20	-0.29	-0.05	0.18	-0.03	-0.01	0.60
Recreation	-3.91	-0.10	-0.14	0.04	0.46	0.26	-0.27	-0.37	-0.73	-1.27	-1.45	-0.25	0.12	-0.13	0.58	0.32	-0.52	-0.32	0.41	-0.12	-0.02	0.45
Education	-2.69	-0.26	-0.14	-0.09	0.10	-0.02	0.18	0.33	0.55	0.94	1.30	-0.02	-0.15	-0.01	0.70	0.08	-0.48	-0.25	0.45	0.00	0.00	1.78
Charity	-1.44	-0.07	0.01	-0.06	-0.02	-0.09	-0.03	-0.07	-0.10	-0.15	-0.17	0.14	0.01	-0.09	0.58	-0.11	-0.47	-0.31	0.56	-0.14	0.00	1.21
Telephone	-2.60	-0.04	-0.16	0.06	0.12	-0.11	0.00	0.06	0.03	0.16	-0.01	-0.41	-0.22	0.08	0.33	0.15	-0.87	-0.01	0.33	-0.01	-0.01	0.43
HS LodgingOut	-1.57	-0.11	-0.15	0.02	0.12	-0.04	-0.07	-0.15	-0.15	-0.05	-0.27	-0.35	-0.26	-0.02	0.80	0.23	-0.43	-0.23	0.25	-0.06	-0.01	0.65
HS FurnishAppl	-1.91	-0.15	-0.04	-0.02	0.01	0.00	0.10	0.09	0.21	0.46	0.69	-0.28	-0.26	-0.07	0.46	0.21	-0.33	-0.57	0.53	-0.17	-0.01	0.93
HS Operations	-1.20	-0.13	0.15	-0.17	0.00	-0.04	0.02	0.03	0.05	0.08	0.10	0.01	-0.10	-0.02	0.34	0.16	-0.54	-0.20	0.50	-0.53	-0.01	0.70
HS Electricity	-2.45	-0.18	0.06	0.07	0.06	-0.02	0.10	0.13	0.17	0.28	0.35	-0.07	-0.12	-0.02	0.00	0.16	-0.86	0.06	0.27	-0.40	-0.02	0.37
HS WaterSewerTrash	-1.44	0.02	-0.48	-0.28	0.02	-0.03	0.05	0.07	0.13	0.22	0.32	0.08	-0.20	-0.02	0.17	0.14	-0.69	0.01	0.34	-0.60	-0.01	0.42
HS GasFuelCoal	0.63	0.11	-0.01	0.17	-0.20	-0.13	-0.29	-0.41	-0.57	-0.74	-0.77	0.15	0.11	-0.07	0.21	0.17	-0.72	-0.02	0.33	-0.55	-0.02	0.54
HS RentPrimary	-1.70	-0.06	-0.01	0.04	0.05	-0.05	0.19	0.25	0.33	0.48	0.60	-0.20	-0.08	0.00	0.37	0.19	-0.10	-0.01	0.15	0.89	-0.20	0.45
HS OwnRentEquivalent	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.09	-0.56	-0.06	0.22	-0.78	-0.02	0.30

