Inequality in the Joint Distribution of Consumption and Time Use*

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ABSTRACT

This paper examines patterns in both leisure and consumption over the past four decades. We use time use surveys stretching from 1975 to 2016 to measure the patterns of leisure across the population. We estimate the distribution of leisure time conditional on hours worked and other individual level and family level characteristics. We show that with these characteristics, we can fairly accurately predict the conditional distribution of leisure within our time use samples. We then use these estimates to predict the distribution of leisure using work hours and other characteristics in the Consumer Expenditure Survey, a survey that also provides detailed information on consumption. The advantage of this approach is that it gives us measures of consumption and leisure for each family within a single data source. Combining consumption and leisure allows us to characterize more accurately changes in the distribution of well-being. Although we document a clear negative relationship between leisure and consumption, this relationship has become less pronounced over time, increasing overall inequality.

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I. Introduction

There is a growing national debate in the U.S. on trends in the distribution of economic well-being. This debate and most analyses of economic well-being rely almost exclusively on wage or income data. A smaller literature has examined consumption data (Cutler and Katz 1991; Attanasio, Battistin and Ichimura 2006; Slesnick 2001; Krueger and Perri 2006; Meyer and Sullivan 2009), and a recent study has examined changes in leisure inequality (Aguiar and Hurst, 2007), but there is little evidence on how well-being, measured as a function of both consumption and leisure, has changed over time. We combine consumption and time use data to provide a more comprehensive analysis of the changes over time in inequality and economic well-being.

Much of the debate over changes in economic well-being in the U.S. has focused on income-based measures of well-being. The official measure of poverty in the U.S. is based on pre-tax money income, and much of the discussion of economic inequality in the U.S. concentrates on income inequality. Income is an important indicator of economic well-being as it reflects the resources available for consumption. Moreover, measures of income are readily available from many data sources. However, recent studies have emphasized that consumption is a better measure of well-being than income (Meyer and Sullivan 2003, 2008, 2011). Consumption reflects permanent income and thus captures the long-term prospects of a family better than current income. Consumption is more likely to capture the effects of saving and dissaving, the ownership of durable goods such as houses and cars, and access to credit. Consumption is also more likely to reflect private and government transfers.

Economic well-being, however, depends on the consumption of not just goods and services, but also the consumption of time. Goods and services are captured by standard consumption measures, but the extent to which one's circumstances permit one to consume leisure are omitted by these measures. If, for example, consumption and leisure have both fallen for a group such as the middle-class or poor, it is of great concern. If, on the other hand, consumption has fallen for a group, but leisure has moved in the opposite direction, the change is more favorable. Combining consumption and

leisure allows us to characterize more accurately changes in the distribution of well-being.

These issues are particularly important when analyzing trends over time given recent policies that have explicitly had as goal the reduction of leisure time, welfare reform being the prime example (Moffitt 2006). In addition, the diffusion of technological advances such as dishwashers and microwave ovens have made it easier to substitute money for time.

Past work on time use has examined individuals, even though x percent of people live in families. Families share resources including time and often do not consume the same amount of leisure. It is often optimal to specialize instead of share equally, and complicated forms of compensation can and do occur within the family. In such a situation, looking at inequality in individual leisure provides a mistaken view of the distribution of well-being.

We use three time use surveys stretching from 1975 to 2003 to measure the patterns of leisure across the population. With these data we construct imputed measures of leisure that we can combine with consumption data from the Consumer Expenditure (CE) Survey. We do this by estimating the relationship in the time use data between leisure and other observable characteristics that are also available in the CE Survey, including individual level characteristics such as the work hours, age, education, and marital status, and family level characteristics including family size and composition. We use the data to estimate the entire conditional distribution of leisure in a way similar to how Autor, Katz and Kearney (2008) and others have examined income. These characteristics fairly accurately predict the distribution of leisure within our time use samples. We then use these estimates to predict the distribution of leisure for each adult in the CE Survey. This measure of individual leisure is then aggregated up to the family level. We also examine non-market time that can be directly calculated from the consumption data. The advantage of this approach is that we have measures of consumption and leisure for each family. Our results document a clear negative relationship between leisure and consumption, although this relationship has become less pronounced over time. On average, leisure increases slightly over the full time period, and we find evidence of a modest increase in leisure inequality. Between 1972-1973 and

1985, leisure declines more for those at the top of the consumption distribution than for those at the bottom, but the reverse is true for the period between 1985 and 2003. Increases in consumption inequality between 1972-1973 and 1985, were offset by relative gains in leisure for those at the bottom of the consumption distribution. Between 1985 and 2003, relative gains in consumption for those at the bottom of the consumption distribution were offset by relative declines in leisure.

II. Data

Time Use Data

For time use data we use three nationally representative surveys: the 1975-1976 Time Use in Economics and Social Accounts; the 1985 Americans' Use of Time; and the 2003, 2007 and 2010 American Time Use Survey.[1] These are diary surveys that collect detailed information on how individuals allocate their time for a single day. The 1975-1976 survey includes limited information on the time use of the spouse for married individuals, but we do not include these spouses in our sample.[2] The 1985 survey only includes individuals 18 and older, so we exclude individuals under 18 from the other surveys. We are also primarily interested in the time use of adults, so we would likely make this restriction in any case. Each of the resulting time use samples is nationally representative of individuals 18 and over.[3] All analyses reported below are weighted using survey weights. These weights are adjusted so that each day of the week and each survey year is represented equally.

CE Survey

Our consumption data come from the Consumer Expenditure (CE) Survey, which is the most comprehensive source of consumption data in the U.S. We use the Interview component of the CE Survey for the years closest to the years for which we have time use

[1] Time use data are also available from the 1965–1966 America's Use of Time and the 1992-1994 National Time Use Survey. We may extend our analyses to include these surveys in future drafts. However, the years we employ are more comparable over time and to the CE Survey.
[2] This survey also interviews individuals repeatedly, but due to high attrition rates we restrict our sample to first interviews for each individual.
[3] The 1975 survey excludes individuals living on military bases. The 1985 sample is representative of adults living in households with at least one telephone.

data: 1972-1973, 1985, and 2003. Expenditure data are reported at the level of the consumer unit, which is defined as either a group of individuals who are related by blood or marriage, a single or financially independent individual, or two or more persons who share resources.[4] Expenditures are reported for up to four quarters. As in the time use data, we restrict our sample to individuals 18 and older.[5] All analyses reported below are weighted using survey weights.

In choosing our CE Survey hours variables, we need to keep in mind that in the CE we hope to estimate leisure over the entire year. As we show below, information on time spent working is an important predictor of leisure time. In the time use data we are able to estimate the relationship between work in a typical week or day and leisure. Both the CE Survey and the time use surveys provide information on usual hours worked in weeks that an individual works.[6] To construct a measure of unconditional hours worked per week in the CE Survey we multiply usual hours by reported weeks worked in the 12 months prior to the survey divided by 52.14. In the time use data, weeks worked is not available, but a measure of unconditional hours worked per week can be constructed by multiplying hours worked in the interview day by 7.

Additional adjustments need to be made to the measure of hours worked in the 1972-1973 CE Survey. For these years, we do not observe a continuous measure of hours worked for each adult. Rather, we observe whether the adult works and whether he or she works full-time or part-time. From this information, we impute a continuous measure of usual hours worked for adults that work. Using data from the 1980 CE Survey, we regress usual hours worked per week on an indicator for whether the person works full-time and controls for age and education for a sample of adults who work. We then use the estimates from this regression to predict usual hours worked for adult workers in the 1972-1973 survey using their reported information on full-time status, age, and education.

[4] Individuals are considered to be sharing resources if expenses are not independent for at least two of the three major expense categories: housing, food, and other living expenses.
[5] These individual level data are available in the member files of the CE Survey.
[6] Hours worked information in the CE Survey and time use samples is reported for a typical week when working, except in the 1985 time use survey where hours are reported for the previous week, regardless of work status.

Education and marital status are also missing for adults who are neither the head of the family nor the spouse of the head in the 1972-1973 CE Survey (about 15 percent of adults for these years). For these adults with missing education and marital status we assign the mean value of these variables from the 1980 CE Survey. Specifically, we calculate mean education and marital status for individuals that are neither a head or spouse in the 1980 CE Survey by relationship to the head and by education of the head. We then assign the appropriate mean to adults in the 1972-1973 CE Survey who have missing values for these variables.

Demographic Characteristics

Table 1 compares the means of various demographic characteristics in both the CE Survey and the time use samples of individuals 18 and older. The characteristics of the time use samples are fairly similar to those of the CE Survey for a given year, but there are notable exceptions. The age distributions in the CE Survey samples match fairly well with those for the time use samples, and changes over time in the age composition of the sample is also comparable. Education is less comparable across data sources. The time use samples tend to be higher educated. Also, the time use samples have more young children beginning with the 2003 survey. As we show below, for the purposes of predicted leisure time, time spent working is considerably more important than individual or family demographic characteristics. Measures of usual hours worked in weeks that the individual works match up very well across data sources both in level and in trend.[7] The mean for unconditional hours worked in the time use sample (which is based on reported hours worked in the interview day) is greater than that for the CE samples (which is based on usual hours and weeks worked). Both measures rise between the early 1970s and 1985.

III. Measuring Leisure and Consumption

Defining Leisure

[7] Hours worked information in the CE Survey and time use samples is reported for a typical week when working, except in the 1985 time use survey where hours are reported for the previous week, regardless of work status.

While a growing literature examines leisure in the U.S., there is little consensus on exactly how to define leisure (for example see Biddle and Hamermesh 1990; Aguiar and Hurst 2007; and Ramey 2007). Ambiguity arises because some activities, such as gardening, can be viewed as either home production or leisure. In addition, other activities provide utility while at the same time serving as intermediate inputs that may increase productivity, such as sleeping. Furthermore, for our analyses that combine both consumption and leisure, issues of double counting arise because some expenditures are made in order to increase leisure time such as spending on domestic service, and babysitting. When possible, we will make adjustments to our consumption measure to avoid such double counting.

For the analyses presented below, our base definition of leisure follows "Leisure Measure 3" defined in Aguiar and Hurst (2007). This measure includes "entertainment/social activities/relaxing" and "active recreation," as well as some activities that may be categorized as both leisure and home production such as gardening and pet care. This measure also includes activities that provide direct utility but may also be viewed as intermediate inputs such as time spent sleeping, eating, and on personal care. Finally, this measure includes time spent in child care.[8] In addition to this measure of leisure, we examine the robustness of our results by considering both narrower and wider definitions. The narrower leisure definition follows "Leisure Measure 2" of Aguiar and Hurst, while the broader measure is non-market time which includes all activities except market work.

Conceptual Problems in Relating Leisure to Well-Being

A number of conceptual issues complicate the link between leisure and well-being (also see Nordhaus 2008). Money and leisure can be easily substituted, as can various activities. We want a broad definition of leisure given the substitutability of various uses of time. If one includes time spent in child care as leisure time, then there will not be an incorrectly measured increase in well-being as someone goes to work and sends his children to day care for an equal number of hours. This approach does not completely

[8] Ramey (2007) argues that garden and pet care as well as childcare should not be included in leisure. We examine the extent to which our main findings are sensitive to how leisure is defined.

solve the problems as we are left with the issue of how to value different types of non-market time. If a person reduces child care and increases work by the same amount, there would be no change in well-being if child-care time is valued at the market wage. However, if the person is more productive in market work or prefers child care less than other leisure, then there should be an increase in well-being.

To address the fact that some expenditures are made in order to increase leisure time, we exclude some spending from our measure of consumption to avoid double counting. Some spending can substitute directly for housework time. For example, one can spend less time in home production and more time in leisure by hiring a housekeeper. However, since we will capture the benefits of the housekeeper through our measure of leisure, we exclude the cost of the housekeeper from our measure of consumption. Similarly, we exclude spending on durables such as washers and dryers (but include TVs, stereos, etc.).

In the limit, if we call all nonwork time leisure, then we should be able to predict leisure with work perfectly. However, a substantial amount of nonwork time is home production. How it should be handled is unclear. Presumably it has value and that is why people do it, though it may be valued less than other time. In the analyses that follow, we will look at time spent in leisure as well as a broader measure of time spent outside of market work.

If one considers the leisure/work first order condition, then the last hour of work must have an after-tax payoff equal to the leisure given up. For someone not working, ignoring costs of work, their leisure must be valued more than their wage. Accounting for work costs, their leisure value could be less than their wage. Inframarginal units of both leisure and consumption goods are presumably valued more than the marginal units.

Although the market wage is a measure of the value of leisure, data on wages alone are not sufficient indicators of well-being. Only half of adults have a wage, and private and government transfers make well-being very different from the wage even for those for whom a wage is observed. The process from wages to family material well-being depends on many processes including family formation, fertility, labor supply, and, disability. In addition, we need to account for intertemporal behavior by a family through saving and borrowing, and flows of resources from outside, in particular transfers from

family, friends, and the government. These processes will differ across families and over time. If we ignore these features we miss that wages are endogenously dependent on these processes and that changes in wages may be counteracted by these forces. In other words, changes in wages are very far from changes in well-being.

Definitions of Consumption

The CE Survey provides detailed information on family level expenditures. To convert reported expenditures into a measure of consumption, we make a number of adjustments. First, expenditures on durable goods tend to be large and infrequent because the entire cost of new durables is included in current expenditures. In the case of vehicle expenditures, we are able to convert vehicle spending to a service flow equivalent. Second, consumption does not include spending that is better interpreted as an investment such as spending on education and health care, and outlays for retirement including pensions and social security.[9] Third, to convert housing expenditures to housing consumption for homeowners, we subtract housing outlays such as mortgage interest payments, property tax payments, and spending on insurance, maintenance and repairs, and add the reported rental equivalent of the home. Because respondents living in government or subsidized housing do not report a rental equivalent, we use detailed housing characteristics in the CE Survey to impute a rental value for these units. For more details on our measure of consumption see Meyer and Sullivan (2009). In previous work, we have examined consumption measures that include the value of health insurance. However, because information on health insurance coverage is not available in 1972-1973 or in 1985, the measure of consumption used throughout this paper does not include health insurance.

An accurate price index is critical for analyses of changes in consumption over time. Bias in the most frequently used price index, the CPI-U, is well-documented (Boskin et al. 1996; Berndt 2006; Gordon 2006; Johnson, Reed, and Stewart 2006). This bias can be very substantial for changes over long time periods. The BLS has

[9] How health care expenditures should be treated is not as clear as this comment suggests since many health expenditures are elective. We also exclude spending on individuals or entities outside the family, such as charitable contributions and spending on gifts to non-family members. This category is very small relative to total consumption.

implemented several methodological improvements in calculating the CPI-U over the past 25 years. Although the BLS does not update the CPI-U retroactively, it does provide a consistent research series (CPI-U-RS) that incorporates many of the changes.[10] However, a consensus view among economists is that the CPI-U-RS does not make sufficient adjustment for the biases in the CPI-U. Between 1972 and 2005 the CPI-U grew on average between 0.4 and 0.5 percentage points per year faster than the CPI-U-RS, with essentially all of this difference occurring before 1998. A reasonable estimate of the bias in the CPI-U over this period is much larger–about 1.3 percentage points per year between 1978 and 1995.

Given that the CPI-U-RS does not fully correct for bias in reported price changes, the results for consumption we report are indexed using an adjusted CPI-U-RS that subtracts 0.8 percentage points from the growth in the CPI-U-RS index each year. We base this adjustment on Berndt (2006) and Gordon (2006) who argue that even with recent alterations to the CPI-U methodology that make it and the CPI-U-RS essentially the same for recent years, a bias of 0.8 percentage points per year remains. See Meyer and Sullivan (2011) for more details.

Family Level Measures of Leisure and Consumption

The time use surveys provide information on time spent in leisure at the individual level. This allows us to predict leisure at the individual level in the CE Survey as explained in the following section. For our analysis of leisure and consumption, we focus on these measures at the family level for two reasons. First, the leisure time of individuals is not likely to be independent of the leisure time of other individuals in the same family. The family allows specialization by family members in market and non-market work and compensation across family members can occur in ways that are difficult to observe.[11] Second, we will examine leisure and consumption for the same observation, and our consumption data are only available at the family level. We calculate family level leisure or non-market time as the sum of all leisure or non-market

[10] The CPI-U-RS does not incorporate all of the methodological improvements to the CPI-U. See Stewart and Reed (1999) for more details.

[11] The 1975 time use survey includes limited information on the time use of spouses. We plan to use this information to investigate further the dependence of one's leisure on that of other family members.

time for adults in the family divided by the number of adults in the family. We express leisure (and non-market time) on a per adult basis because, unlike consumption, there are not likely to be economies of scale in leisure. Basing family level leisure off of the leisure time of only the adults in the family seems like a reasonable compromise given the limited time use information on children and the likelihood that they are engaged mostly in schooling and leisure.[12] Our measures of consumption are equivalence scale adjusted using a scale that follows NAS recommendations (Citro and Michael 1995): $(A + 0.7K)^{0.7}$, where A is the number of adults in the family and K is the number of children.. This adjustment does allow for economies of scale in consumption, and for differences in consumption for children and adults.

IV. Combining Consumption and Time Use Data

In order to obtain a more comprehensive measure of economic well-being we combine consumption data with information on leisure or non-market time. We approximate leisure by estimating the relationship in the time use data between all percentiles of leisure and other observable characteristics that are also available in the CE Survey. We then use these estimates to predict the distribution of leisure for each household in the CE Survey based on these observable characteristics.

Our base quantile regression specification for the α quantile of leisure at the individual level is

$$(1)\quad Q_{\alpha}(l_{it}) = \beta_{1t} X_{it}^{T} + \beta_{2t} W_{it}^{T} + \delta_{t},$$

where l_{it} denotes hours of leisure per week for individual i in year t, X_{it}^{T} is a vector of individual characteristics, and W_{it}^{T} is a vector of family characteristics, and superscript T denotes observations from the time use samples. We then use the coefficient estimates of Equation (1) to predict the α quantile of leisure for adults in the consumption data (denoted with superscript C):

[12] We are investigating the time use patterns of children in the 1993 data and the recent ATUS data to examine this supposition.

(2) $\hat{Q}_{\alpha}(l_{it}) = \hat{\beta}_{1t} X_{it}^{C} + \hat{\beta}_{2t} W_{it}^{C} + \hat{\delta}_{t}$.

We estimate Equation (1) for 99 different percentiles, yielding 99 predicted values of leisure for each observation. Thus, for a sample of N individuals, we have 99 X N predicted values for leisure. The demographic characteristics included in these specifications are those that are likely to be correlated with leisure and that are defined similarly in both the time use and consumption data. The individual characteristics (X) include indicator variables for gender, marital status and age and education categories. The most important elements of X pertain to hours of work. We will employ two different measures of hours an individual spends working per week—either a measure of hours worked in a week when the individual works, or an unconditional measure of hours worked. These measures are the hours worked variables presented in Table 1. In the analyses that follow, we will present results for both of these measures of work time. The family characteristics (W) include the number of children under 18 in the family, the number of adults in the family, and the number of children under 5. All specifications also include controls for the interview day of the week and interview month.

Estimates from the Time Use Samples

Table 2 reports estimates of the coefficients in Equation (1) for three different specifications at the median. The first 3 columns report estimates for a specification including individual and family characteristics but excluding any measure of hours worked. The specification in columns 4 through 6 includes a measure of hours worked per week, while the specification in columns 7 through 9 includes a measure of usual hours worked. The specification in columns 4 through 6 is also presented for two other percentiles: the 25th and 75th. We report the coefficients for the interaction terms of each of the year dummies with observable individual and family characteristics. Although not reported, each regression also includes interview month dummies and interactions of year with interview day of week.[13] The estimates are qualitatively similar year by year with

[13] We do not interact the interview month dummies with year because information on interview month is only available for about a third of the sample in 1985.

those 45-54 typically having the least leisure, those 65+ having the most, men having substantially more leisure (conditional on work) and college grads having quite a bit less leisure than the base group of high school graduates. The magnitudes of the coefficients on the hours an individual works (columns 4-6 and 10-15) are very similar across years. At the median, these estimates suggest that leisure falls by about 0.65 hours for each additional hour worked.

The coefficients on family level variables reveal important differences in leisure across family types. The more children under 18 living in the household, the less leisure adults in the household consume, while the more children under 5 living in the household, the more leisure adults consume. This latter relationship is driven by the fact that the leisure measure we focus on includes time spent in child care. In results not reported, we find that a measure of leisure that excludes time spent with children is not increasing in the number of young children in the family.

The OLS analogue of these regressions is reported in Appendix Table 1. These results again show that estimates are qualitatively similar across years. The year dummies are negative for 1985 relative to 1975 and positive in 2003, but never significantly different from zero, indicating little evidence of a time trend. The first 3 columns report estimates for a specification including individual and family characteristics but excluding any measure of hours worked. The R-squared for this specification is 0.20.[14] The R-squared rises to 0.32 when one controls for usual hours worked per week, while the R-squared is 0.60 when one controls for hours worked on interview day. When separate regressions are estimated for each year, the resulting R-squareds are very similar across years.

The dependent variable in these specifications, leisure hours per week, is constructed from reported leisure in a specific day. The concept of leisure that we hope to closely approximate for a household is leisure averaged over a long time period, say a quarter or a year. One day's reported leisure will have more variation than that over a longer time period because of measurement error and because of daily variation. Thus, the specifications in Appendix Table 1 may be giving highly accurate predictions of true

[14] Going forward we plan to construct a measure of explained variation for Equation (1), decomposing the total variation in leisure into an unexplained component and a component explained by the 99 quantile regressions that we estimate.

annual leisure, even if the reported R-squared is low. 1 minus the R-squared is an upper bound on the share of the variation that is measurement error and day to day variation, with the remaining part accounted for by left out variables and specification error.

Before predicting leisure in the CE Survey, we examine predicted leisure within the time use samples, comparing the actual reported value of leisure to the predicted value of leisure for the 99 X N observations in each year. The kernel densities in Figures 1 through 3 show that the distributions of two different measures of predicted leisure line up very closely with that of actual, reported leisure in each of the time use samples. Standard OLS predictions of the distribution of leisure (using the estimates in Appendix Table 1, for example) would understate dispersion. However, because we predict leisure at every percentile, our distribution of predicted leisure lines up nicely with actual leisure not only in the middle of the distribution but also at the tails.

The similarity in the distributions of predicted and actual leisure can also be seen by comparing percentiles of these distributions. Table 3 shows that various percentiles of predicted and actual leisure line up very closely in each time use sample. The results in Table 3 also emphasize that the distribution of leisure does not change dramatically over time. Median leisure changes very little between 1975 and 2003. At the 10^{th} percentile leisure falls slightly, by a couple of hours, while at the 90^{th} percentile leisure increases by less than two hours, indicating only a modest increase in overall leisure inequality during this period.

Predicting Leisure Out of Sample

Using the estimates from our 99 quantile regressions we generate 99 predicted values of leisure for each adult in our CE Survey samples. Table 4 compares means from the resulting distribution of predicted leisure for adults in the CE Survey samples to actual and predicted leisure for adults in the time use samples, again examining two measures of predicted leisure that differ by which measure for hours worked is used in the regressions and prediction equations. These means are presented by year for the full sample and for subgroups defined by education, age, and gender. The first three rows of each panel report means of actual and predicted leisure within the time use samples. Given the evidence shown above, it is not surprising that these means line up very closely

for the full sample as well as within demographic groups. Mean leisure changes very little over time for the full sample of adults in the time use samples. For the sample of adults in the CE Survey, mean leisure also changes little, falling by 1.1 percent when using the hours in day coefficient but rising by 0.7 percent when using the usual hours coefficient. Looking within subgroups we see similar patterns across surveys. Leisure rises in both the CE Survey and time use samples for the least educated group by at least 3.5 hours during this period. This pattern is consistent with those from Aguiar and Hurst (2007) who also find that increases in leisure are largest for those without a high school degree. Differences in the patterns across surveys are most evident for those with a college degree, where leisure rises for the time use samples between the early 1970s and 1985, while leisure falls for the CE Survey samples. The patterns are comparable within age groups, except for the 25-44 age group between the early 1970s and 1985 when leisure rises slightly for the time use sample while it falls for the CE survey samples.

Non-market time falls more for the CE Survey samples than the time use samples during this period. Again, the difference across surveys is most noticeable for the most educated group. The difference reflects differences in hours worked across the data sources. Previous research has shown a discrepancy between hours worked in time diaries as compared to other survey data (Schor 1992; Robinson and Godbey 1999; Burtless 1999).

V. Consumption and Leisure Trends in the CE Survey

From the measures of predicted leisure at the individual level in the CE Survey discussed in the previous section, we can calculate a family level measure of leisure. The remainder of the paper examines these family level measures of leisure and consumption within the CE Survey samples, using the measures of leisure and consumption explained in Sections III and IV. Family level leisure is expressed per adult in the family while consumption is equivalent scale adjusted using NAS recommended equivalent scale.

Table 5 reports measures of leisure and non-market time aggregated up to the family level along with family level consumption. These family level observations are person weighted. We report the means for the overall sample, and for five mutually

exclusive and exhaustive family types. For the full sample, changes in leisure are very similar to those reported for adults in the CE Survey in Table 4—leisure falls by a little less than 2 hours between 1972-1973 and 1985, and then rises by half an hour between 1985 and 2003. Non-market time also falls between 1972-1973 and 1985, but unlike leisure, non-market time continues to fall between 1985 and 2003. Looking within family types, most groups see little change in leisure between 1985 and 2003 except single individuals where leisure rises by 1.7 hours. Between 1972-1973 and 1985 leisure falls by at least 3 hours for families with children. Non-market time also falls for these groups, indicating an increase in time spent working. For families with a head 65 or older, leisure and non-market time change very little. The modest changes in leisure during this period are also evident by comparing the kernel densities of predicted leisure across years as shown in Figures 4 and 5.

Table 5 also shows a sharp rise in the real value of consumption, which is indexed to 2005 dollars using the adjusted CPI-U-RS discussed in Section III. Between 1972-1973 and 2003 consumption rises by 46 percent for the full sample. The most noticeable increase is evident for single parent families and the elderly who see consumption rise during this period by 51 and 63 percent respectively. Figure 7, which reports the kernel density plot of the consumption distribution by year, shows that the sharp increase in real consumption between the early 1970s and 2003 occurs throughout the distribution.

Table 6 reports the 90/10, 50/10, 90/50 ratios and differences for consumption, leisure, and non-market time for the CE Survey samples. Between 1972-1973 and 1985, consumption inequality rose considerably while leisure inequality rose modestly. The 90/10 ratio for consumption rose from 3.63 in 1972-1973 to 4.23 in 1985. This rise in inequality is evident in both the top and bottom parts of the distribution. During this period leisure inequality also rises. However the range from the 90^{th} percentile to the 10^{th} is small compared to that for consumption. The rise in leisure inequality during this period is driven by an increase in the top part of the leisure distribution.

Between 1985 and 2003, consumption inequality falls while leisure inequality rises slightly and inequality in non-market time remains flat. For consumption the 50/10 ratio declines during this period from 2.20 to 2.06, while the 90/50 ratio rises slightly. For leisure, the 50/10 ratio rises slightly, while the 90/50 ratio does not change.

VI. Bivariate Analyses of Consumption and Leisure

The key advantage of having measures of both leisure and consumption is that we can examine changes in these important components of well being for the same families. Table 6 reports correlations between our leisure, non-market time, and consumption measures by year for families in the CE Survey. The correlations between leisure and consumption are all significantly negative, indicating the substitution between consumption goods and leisure time. Families with high levels of consumption tend to have lower levels of leisure time. A similar relationship is evident for consumption and non-market time. Between 1985 and 2003, the correlation between consumption and leisure or non-market time declines in absolute value. This change indicates that while a measure of inequality that incorporates both consumption and leisure may be less pronounced than inequality based on consumption alone, the distribution of leisure had more of an equalizing effect in the past than it does now.

Figure 8 shows the locally-weighted, regression smoothed (LOWESS) bivariate distribution of leisure for the different percentiles of the consumption distribution. The downward sloping plot indicates that in each year leisure declines monotonically as consumption rises. Also, as was indicated by the correlations in Table 5, the relationship between leisure and consumption has become flatter over the period between 1972-1973 and 2003. Between 1972-1973 and 1985 leisure falls slightly at the bottom of the consumption distribution, but falls more noticeably at the top of the distribution. Between 1985 and 2003 leisure continues to fall slightly at the bottom of the consumption distribution while leisure rises for those at the top of the distribution. A similar pattern is evident for the bivariate distribution of non-market time and consumption (Figure 9).

Additional evidence of the relationship between leisure and consumption is presented in Table 8, which reports mean consumption, predicted leisure, and changes in these measures, all by consumption decile. The first 3 columns report mean consumption for each consumption decile. Consumption rises sharply over time in all deciles, although the rise is slightly more pronounced at the very bottom and in the top four deciles. The results in columns 4 though 6 again show that leisure declines

monotonically with consumption. Comparing families in the bottom decile of consumption in 1972-1973 to those in the bottom decile in 1985, we see that mean leisure declines slightly by 0.78 hours. The decline in leisure during this period is more noticeable for those at the top, a drop of 3.31 hours. Between 1985 and 2003, leisure continues to decline at the bottom, falling 1.37 hours, while the top experiences a 1.49 hour increase in leisure.

Taken together, the patterns for leisure and consumption are different in our two periods. Between 1972-1973 and 1985, the bottom of the consumption distribution made the smallest gains in consumption of goods and services, but leisure for this group rose relative to other groups, offsetting the decline in relative consumption. In contrast, the bottom decile of consumption enjoyed the largest gains in consumption between 1985 and 2003, but leisure for this group fell relative to other groups.

VII. Conclusions

Economic well-being depends on the consumption of not just goods and services, but also the consumption of leisure time. To characterize more accurately changes in the distribution of well-being in the U.S. we examine measures of leisure and consumption for the same families. We present a methodology for predicting the full distribution of leisure from information on observable characteristics, particularly hours worked. Our approach yields reasonably accurate predictions of leisure within sample. In general, we find that leisure declines slightly for families between 1972-1973 and 2003. Inequality in leisure rises only modestly during this period. By contrast, we document noticeable increases in consumption throughout the distribution. Consumption inequality also rises considerably, but the entire rise in inequality occurs between 1972-1973 and 1985. Consumption inequality falls a bit after 1985.

Looking and leisure and consumption jointly, we find a clear negative relationship between leisure and consumption, although this relationship has become less pronounced over time. This change indicates that while a measure of inequality that incorporates both consumption and leisure may be less pronounced than inequality based on consumption alone, the distribution of leisure had more of an equalizing effect in the past

than it does now. Increases in consumption inequality between 1972-1973 and 1985, were offset by relative gains in leisure for those at the bottom of the consumption distribution. Between 1985 and 2003, relative gains in consumption for those at the bottom of the consumption distribution were offset by relative declines in leisure.

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Table 1: Mean Demographic Characteristics, CE Survey and Time Use Surveys

	All Years		1972-1973 or 1975		1985		2003	
	Time Use	CE Survey	Time Use	CE Survey	Time Use	CE Survey	Time Use	CE Survey
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age 18-24	0.144	0.160	0.186	0.194	0.129	0.160	0.116	0.127
	(0.005)	(0.001)	(0.013)	(0.002)	(0.005)	(0.002)	(0.003)	(0.001)
Age 25-44	0.403	0.388	0.358	0.358	0.459	0.417	0.393	0.390
	(0.005)	(0.001)	(0.013)	(0.003)	(0.008)	(0.003)	(0.004)	(0.002)
Age 45-54	0.168	0.161	0.172	0.163	0.140	0.129	0.191	0.191
	(0.005)	(0.001)	(0.012)	(0.002)	(0.005)	(0.002)	(0.003)	(0.002)
Age 55-64	0.131	0.133	0.126	0.136	0.133	0.131	0.133	0.131
	(0.004)	(0.001)	(0.009)	(0.002)	(0.005)	(0.002)	(0.003)	(0.001)
Age 65+	0.154	0.157	0.158	0.149	0.139	0.162	0.167	0.161
	(0.004)	(0.001)	(0.010)	(0.002)	(0.005)	(0.002)	(0.003)	(0.002)
Male	0.484	0.474	0.490	0.471	0.483	0.477	0.478	0.475
	(0.006)	(0.002)	(0.015)	(0.003)	(0.008)	(0.003)	(0.004)	(0.002)
Less then HS	0.210	0.267	0.328	0.369	0.173	0.264	0.128	0.168
	(0.005)	(0.001)	(0.014)	(0.002)	(0.006)	(0.003)	(0.003)	(0.002)
HS Degree	0.363	0.327	0.365	0.358	0.431	0.328	0.291	0.295
	(0.005)	(0.001)	(0.014)	(0.002)	(0.008)	(0.003)	(0.004)	(0.002)
Some College	0.173	0.220	0.150	0.150	0.172	0.217	0.198	0.293
	(0.004)	(0.001)	(0.010)	(0.002)	(0.006)	(0.002)	(0.003)	(0.002)
College Grad	0.254	0.187	0.156	0.124	0.224	0.192	0.383	0.244
	(0.004)	(0.001)	(0.011)	(0.002)	(0.007)	(0.002)	(0.004)	(0.002)
Married	0.605	0.629	0.639	0.692	0.643	0.617	0.533	0.579
	(0.005)	(0.001)	(0.014)	(0.002)	(0.007)	(0.003)	(0.004)	(0.002)
Number of children under 18	0.787	0.886	0.993	1.143	0.662	0.774	0.707	0.740
	(0.015)	(0.004)	(0.039)	(0.008)	(0.016)	(0.007)	(0.008)	(0.005)
Number of adults in family	2.170	2.285	1.970	2.349	2.541	2.289	2.000	2.217
	(0.010)	(0.003)	(0.023)	(0.005)	(0.016)	(0.006)	(0.008)	(0.004)
Number of children under 5	0.204	0.174	0.136	0.194	0.150	0.170	0.324	0.157
	(0.005)	(0.001)	(0.012)	(0.002)	(0.007)	(0.002)	(0.006)	(0.002)
Usual hours worked per week when working	26.146	26.571	24.678	25.074	26.427	27.077	27.334	27.562
	(0.250)	(0.061)	(0.638)	(0.104)	(0.353)	(0.122)	(0.185)	(0.088)
Unconditional usual hours worked per week		23.161		20.753		23.812		24.916
		(0.061)		(0.101)		(0.124)		(0.089)
Hours worked on interview day*7	27.432		26.545		28.028		27.723	
	(0.368)		(0.934)		(0.517)		(0.287)	
N	23,363	138,147	1,451	39,072	4,153	39,241	17,759	59,834

Notes: Samples are at the individual level and include adults 18 and older. Results are weighted using survey weights. Weights from the time use survey are adjusted so that each day and each survey year is represented equally. In the 1970s, the time use data are for 1975 while the CE Survey data are from 1972-1973. Standard errors are reported in parentheses.

Table 2: Quantile Regressions of Leisure Hours Per Week on Demographic Characteristics and Work, Time Use Surveys

Quantile	Median			Median			Median			25th Percentile			75th Percentile		
Interaction with	year=1975	year=1985	year=2003	year=1975	year=1985	year=2003	year=1975	year=1985	year=2003	year=1975	year=1985	year=2003	year=1975	year=1985	year=2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Age 25-44	-6.868	-6.164	-4.660	-0.413	0.653	0.526	-0.365	0.124	-0.324	-0.946	2.914	1.762	0.277	-0.978	-0.751
	(1.598)	(0.894)	(0.617)	(0.915)	(0.515)	(0.354)	(1.359)	(0.766)	(0.524)	(0.647)	(0.371)	(0.260)	(0.555)	(0.313)	(0.214)
Age 45-54	-6.899	-9.489	-5.557	-4.294	-0.352	-0.630	-4.149	-3.282	-1.680	-4.075	0.776	0.090	-1.113	-2.257	-1.463
	(1.925)	(1.079)	(0.654)	(1.093)	(0.621)	(0.376)	(1.630)	(0.917)	(0.554)	(0.783)	(0.448)	(0.276)	(0.662)	(0.379)	(0.226)
Age 55-64	0.378	5.114	0.266	-1.505	-1.023	-0.593	0.107	2.649	-0.873	-1.821	0.436	0.803	-1.026	-2.461	-1.563
	(1.905)	(1.102)	(0.693)	(1.096)	(0.634)	(0.398)	(1.619)	(0.932)	(0.585)	(0.762)	(0.466)	(0.292)	(0.652)	(0.386)	(0.241)
Age 65+	20.879	19.717	21.498	1.753	4.482	1.974	6.964	8.607	4.312	2.062	6.769	4.795	2.891	-0.842	-0.133
	(1.867)	(1.097)	(0.681)	(1.099)	(0.637)	(0.396)	(1.645)	(0.943)	(0.593)	(0.811)	(0.469)	(0.294)	(0.662)	(0.387)	(0.239)
Male	-3.413	-3.889	-2.277	10.140	7.317	5.550	7.609	2.120	3.400	9.439	5.195	4.077	9.870	6.681	5.227
	(0.983)	(0.525)	(0.286)	(0.599)	(0.310)	(0.167)	(0.922)	(0.458)	(0.251)	(0.421)	(0.225)	(0.122)	(0.375)	(0.195)	(0.104)
Less then HS	-0.220	2.781	5.104	1.152	0.760	1.543	0.677	0.372	1.612	-1.041	-0.779	1.245	1.410	1.886	1.841
	(1.217)	(0.758)	(0.480)	(0.701)	(0.434)	(0.276)	(1.039)	(0.642)	(0.408)	(0.514)	(0.320)	(0.202)	(0.415)	(0.262)	(0.167)
Some College	0.586	-3.267	-1.859	-0.845	-1.859	-1.559	-0.558	-2.727	-1.169	-3.577	-2.949	-1.980	-0.525	0.116	-0.956
	(1.469)	(0.740)	(0.418)	(0.850)	(0.424)	(0.240)	(1.241)	(0.624)	(0.353)	(0.585)	(0.309)	(0.176)	(0.526)	(0.259)	(0.146)
College Grad	-6.362	-2.800	-3.570	-0.024	-1.340	-2.003	-1.224	0.060	-1.550	-3.478	-2.625	-1.377	-0.839	-0.342	-1.348
	(1.485)	(0.692)	(0.348)	(0.851)	(0.398)	(0.200)	(1.253)	(0.586)	(0.295)	(0.617)	(0.290)	(0.147)	(0.511)	(0.246)	(0.121)
Married	-2.019	-0.564	-1.504	-3.053	-1.823	-2.196	-4.083	-0.976	-1.470	-2.262	-1.216	-1.266	-3.196	-1.684	-1.387
	(1.153)	(0.609)	(0.330)	(0.663)	(0.349)	(0.189)	(0.986)	(0.514)	(0.278)	(0.470)	(0.255)	(0.137)	(0.398)	(0.213)	(0.115)
Number of children under 18	-0.886	0.156	-0.216	-0.599	-1.190	-1.137	-1.337	-1.315	-0.712	-1.568	-1.751	-1.135	-0.440	-0.765	-0.812
	(0.418)	(0.314)	(0.165)	(0.242)	(0.180)	(0.095)	(0.354)	(0.265)	(0.140)	(0.167)	(0.131)	(0.070)	(0.148)	(0.109)	(0.058)
Number of adults in family	0.749	0.000	-0.258	0.234	0.256	-0.462	0.513	0.291	-0.826	-0.995	-0.085	-0.532	0.206	0.585	-0.073
	(0.755)	(0.261)	(0.193)	(0.433)	(0.150)	(0.111)	(0.657)	(0.220)	(0.163)	(0.297)	(0.107)	(0.082)	(0.261)	(0.093)	(0.066)
Number of children under 5	6.440	1.556	2.332	0.131	0.201	1.230	2.653	1.625	1.171	2.015	1.332	1.816	1.215	-0.350	0.411
	(1.105)	(0.669)	(0.232)	(0.668)	(0.384)	(0.133)	(0.983)	(0.565)	(0.196)	(0.508)	(0.283)	(0.098)	(0.379)	(0.241)	(0.081)
Hours worked on interview day*7				-0.638	-0.652	-0.662				-0.532	-0.542	-0.529	-0.778	-0.792	-0.803
				(0.010)	(0.005)	(0.003)				(0.008)	(0.004)	(0.002)	(0.006)	(0.003)	(0.002)
Usual hours worked per week							-0.648	-0.551	-0.662						
							(0.023)	(0.011)	(0.007)						
Survey Year = 1985		-2.823			0.703			-1.981			-3.183			2.169	
		(2.792)			(1.621)			(2.408)			(1.171)			(1.004)	
Survey Year = 2003			-1.819			7.287			6.258			-1.693			7.912
			(2.569)			(1.491)			(2.221)			(1.079)			(0.925)
N			23,363			23,363			23,363			23,363			23,363

Notes: The sample for these regressions is the same as in column 1 of Table 1. See note to Table 1 for more details. In addition to the covariates listed above, each regression includes interview month dummies and interactions of year with interview day of week. Standard errors are reported in parentheses.

Table 3: Distributions of Actual Leisure and Predicted Leisure, Time Use Surveys, 1975-2003

	1975			1985			2003		
	Actual Leisure	Predicted Leisure Using Hours in Day Coefficient	Predicted Leisure Using Usual Hours Coefficient	Actual Leisure	Predicted Leisure Using Hours in Day Coefficient	Predicted Leisure Using Usual Hours Coefficient	Actual Leisure	Predicted Leisure Using Hours in Day Coefficient	Predicted Leisure Using Usual Hours Coefficient
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10th Percentile	82.25	81.18	82.04	81.43	80.48	81.49	79.92	79.33	80.60
20th Percentile	90.77	89.73	91.36	90.42	89.36	91.00	89.83	89.02	90.71
30th Percentile	96.25	96.93	98.47	96.83	96.65	98.74	98.00	96.83	98.48
40th Percentile	103.60	104.49	105.84	103.83	104.10	105.88	104.77	104.50	105.75
50th Percentile	112.58	114.29	113.24	113.17	113.95	113.55	112.58	113.74	113.62
60th Percentile	123.08	123.97	121.33	122.85	124.00	121.24	123.43	124.70	122.28
70th Percentile	133.00	133.11	129.81	132.42	133.21	129.91	133.93	134.90	131.38
80th Percentile	142.92	142.79	139.91	142.33	142.80	140.48	144.08	144.99	141.66
90th Percentile	154.00	154.01	153.73	154.00	153.83	153.60	155.75	155.74	155.41

Notes: See notes to Figure 1.

Table 4: Mean Leisure, Predicted Leisure and Non Market Time By Year and By Demographic Characteristics, CE Survey and Time Use Surveys

	1972-73 or 1975	1985	2003	1972-73 or 1975	1985	2003	1972-73 or 1975	1985	2003	1972-73 or 1975	1985	2003	1972-73 or 1975	1985	2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
PANEL A: Full Sample and By Education	Full Sample			Less Than HS			HS Degree			Some College			College Grad		
Leisure (TU)	115.5	115.1	115.6	119.9	122.2	125.4	115.1	115.2	117.7	114.2	112.7	114.7	108.1	111.4	111.2
Predicted Leisure Using Hours in Day Coefficient (TU)	115.6	115.3	115.8	119.8	121.9	125.2	115.1	115.3	117.6	114.6	113.2	115.3	108.9	111.8	111.6
Predicted Leisure Using Usual Hours Coefficient (TU)	115.5	115.2	115.7	120.5	122.5	125.3	114.9	115.2	117.8	113.8	112.8	115.0	107.9	111.4	111.3
Predicted Leisure Using Hours in Day Coefficient (CE)	118.7	117.0	117.4	121.8	124.2	125.3	117.7	116.8	118.7	117.1	114.1	115.6	114.4	110.6	112.4
Predicted Leisure Using Usual Hours Coefficient (CE)	114.4	113.7	115.2	118.3	120.4	122.8	113.4	113.6	116.8	112.0	110.1	113.3	109.1	108.9	110.3
Non market time (TU)	141.5	140.0	140.3	146.3	147.5	150.9	141.2	139.9	142.1	142.4	138.6	140.8	130.9	135.4	135.1
Non market time (CE)	147.2	144.2	143.1	150.6	152.9	152.0	146.3	144.0	144.3	146.4	141.6	142.0	141.1	135.4	136.7
PANEL B: By Age	Age 18-24			Age 25-44			Age 45-54			Age 55-64			Age 65+		
Leisure (TU)	116.0	116.2	116.8	109.2	110.3	110.7	109.7	108.3	109.2	118.1	119.9	115.8	133.4	132.5	133.6
Predicted Leisure Using Hours in Day Coefficient (TU)	115.9	116.4	117.0	109.4	110.3	110.8	110.0	108.7	109.6	118.0	120.3	116.4	133.5	132.5	133.7
Predicted Leisure Using Usual Hours Coefficient (TU)	115.8	116.5	116.8	109.2	110.3	110.7	109.5	108.6	109.4	118.1	119.8	116.1	133.9	132.5	133.8
Predicted Leisure Using Hours in Day Coefficient (CE)	121.8	118.9	121.7	114.5	111.4	112.4	112.0	111.6	111.1	117.7	118.0	117.5	133.4	132.9	133.2
Predicted Leisure Using Usual Hours Coefficient (CE)	113.8	111.9	117.2	109.2	108.5	110.5	108.9	107.6	108.9	115.2	116.6	115.2	133.2	131.5	132.4
Non market time (TU)	140.8	141.9	142.4	133.0	133.1	133.1	136.4	131.8	132.8	145.7	148.1	141.8	163.6	161.4	163.1
Non market time (CE)	151.0	147.6	149.9	141.8	136.7	136.1	140.9	137.8	135.7	145.7	146.5	143.8	163.8	163.4	162.8
PANEL C: By Gender	Male			Female											
Leisure (TU)	113.6	113.7	114.2	117.2	116.5	116.9									
Predicted Leisure Using Hours in Day Coefficient (TU)	113.2	113.2	113.6	117.9	117.2	117.9									
Predicted Leisure Using Usual Hours Coefficient (TU)	113.7	113.8	114.2	117.2	116.5	117.1									
Predicted Leisure Using Hours in Day Coefficient (CE)	118.1	115.7	116.5	119.3	118.1	118.2									
Predicted Leisure Using Usual Hours Coefficient (CE)	113.9	112.1	114.4	115.0	115.2	116.0									
Non market time (TU)	131.4	132.6	133.9	151.1	146.9	146.2									
Non market time (CE)	139.3	138.0	138.6	154.3	149.9	147.2									

Notes: Samples are at the individual level and include adults 18 and older. All outcomes are measured in hours per week. Results are weighted using survey weights. Weights from the time use data (TU) are adjusted so that each day and each survey year is represented equally. In the 1970s, the time use data are for 1975 while the CE Survey data are from 1972-1973.

Table 5: Consumption, Predicted Leisure, and Non Market Time by Family Type, CE Survey 1972-2003

	1972-73	1985	2003	1972-73	1985	2003	1972-73	1985	2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Full Sample			Single Parent Families			Married Parent Families		
Predicted Leisure Using Hours in Day Coefficient	117.6	115.9	116.4	119.3	116.0	115.6	115.1	112.1	112.6
Predicted Leisure Using Usual Hours Coefficient	113.0	112.6	114.3	113.6	111.6	113.3	110.0	109.0	110.7
Non market time	146.7	143.4	142.2	151.5	145.9	141.9	144.5	139.6	138.5
Consumption	26,181	31,411	38,214	18,285	22,805	27,698	25,133	30,036	36,125
	Single Individuals			Married without Children			Head 65 and Over		
Predicted Leisure Using Hours in Day Coefficient	117.3	114.9	116.5	116.6	114.6	114.2	130.8	130.1	130.9
Predicted Leisure Using Usual Hours Coefficient	112.9	110.6	113.8	111.8	111.4	111.8	129.7	128.0	129.6
Non market time	141.8	139.6	140.1	143.9	140.6	139.1	161.4	160.5	160.1
Consumption	31,124	34,620	40,939	32,911	38,980	47,526	24,016	29,290	39,229

Notes: Data are from various years of the CE Survey. The unit of observation is a family (consumer unit). Predicted leisure is determined using the predicted value of leisure for each adult in the CE Survey for each of 99 quantile regressions, and then aggregated to the family level. Leisure and non-market time are expressed per adult, while annual consumption measures are expressed per adult equivalent in the family using the NAS recommended equivalent scale. Observations are person weighted. The five family types are exhaustive and mutually exclusive. Consumption numbers are expressed in 2005 dollars using the adjusted CPI-U-RS series described in the text.

Table 6
Variance, 90/10, 50/10, and 50/10 Ratios of Consumption, Predicted Leisure, and Non-Market Time, CE Survey, 1972-2003

	Consumption			Predicted Leisure Using Hours in Day Coefficient			Predicted Leisure Using Usual Hours Coefficient			Non-Market Time		
	1972-73	1985	2003	1972-73	1985	2003	1972-73	1985	2003	1972-73	1985	2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
90/10 Ratio	3.632	4.227	3.982	1.550	1.567	1.608	1.742	1.777	1.796	1.329	1.337	1.354
90-10 Difference	3,615	4,754	5,655	50.557	51.464	54.294	62.279	64.363	66.311	41.564	42.384	43.879
90/50 Ratio	1.787	1.921	1.934	1.206	1.231	1.233	1.315	1.330	1.331	1.146	1.174	1.188
90-50 Difference	2,198	2,985	3,647	24.375	26.638	27.133	35.042	36.480	37.191	21.407	24.932	26.594
50/10 Ratio	2.032	2.201	2.059	1.285	1.274	1.304	1.324	1.337	1.350	1.159	1.139	1.139
50-10 Difference	1,418	1,768	2,008	26.182	24.826	27.161	27.238	27.883	29.121	20.157	17.452	17.286
Variance ('000s)	2,602	5,218	7,887	0.388	0.396	0.436	0.552	0.578	0.603	0.151	0.229	0.240
Variance of Log	0.276	0.332	0.305	0.0314	0.0318	0.0353	0.0474	0.0487	0.0496	0.0071	0.0114	0.0121

Notes: See notes to Table 5.

Table 7: Correlations between Consumption, Predicted Leisure, and Non Market Time, CE Survey 1972-2003

	(1)	(2)	(3)	(4)
	Predicted Leisure Using Hours in Day Coefficient	Predicted Leisure Using Usual Hours Coefficient	Non-Market Time	Consumption excluding Health Insurance
		1972-1973		
Predicted Leisure Using Hours in Day Coefficient	1.000			
	(0.000)			
Predicted Leisure Using Usual Hours Coefficient	0.892	1.000		
	(0.003)	(0.000)		
Non-Market Time	0.947	0.811	1.000	
	(0.002)	(0.004)	(0.000)	
Consumption	-0.218	-0.164	-0.268	1.000
	(0.007)	(0.007)	(0.007)	(0.000)
		1985		
Predicted Leisure Using Hours in Day Coefficient	1.000			
	(0.000)			
Predicted Leisure Using Usual Hours Coefficient	0.912	1.000		
	(0.003)	(0.000)		
Non-Market Time	0.977	0.872	1.000	
	(0.001)	(0.003)	(0.000)	
Consumption	-0.246	-0.186	-0.270	1.000
	(0.007)	(0.007)	(0.007)	(0.000)
		2003		
Predicted Leisure Using Hours in Day Coefficient	1.000			
	(0.000)			
Predicted Leisure Using Usual Hours Coefficient	0.929	1.000		
	(0.002)	(0.000)		
Non-Market Time	0.983	0.899	1.000	
	(0.001)	(0.002)	(0.000)	
Consumption	-0.173	-0.155	-0.183	1.000
	(0.005)	(0.005)	(0.005)	(0.000)

Notes: See notes to Table 5.

Table 8
Mean Consumption and Predicted Leisure by Decile of Consumption, Consumer Expenditure Survey, 1972-2003

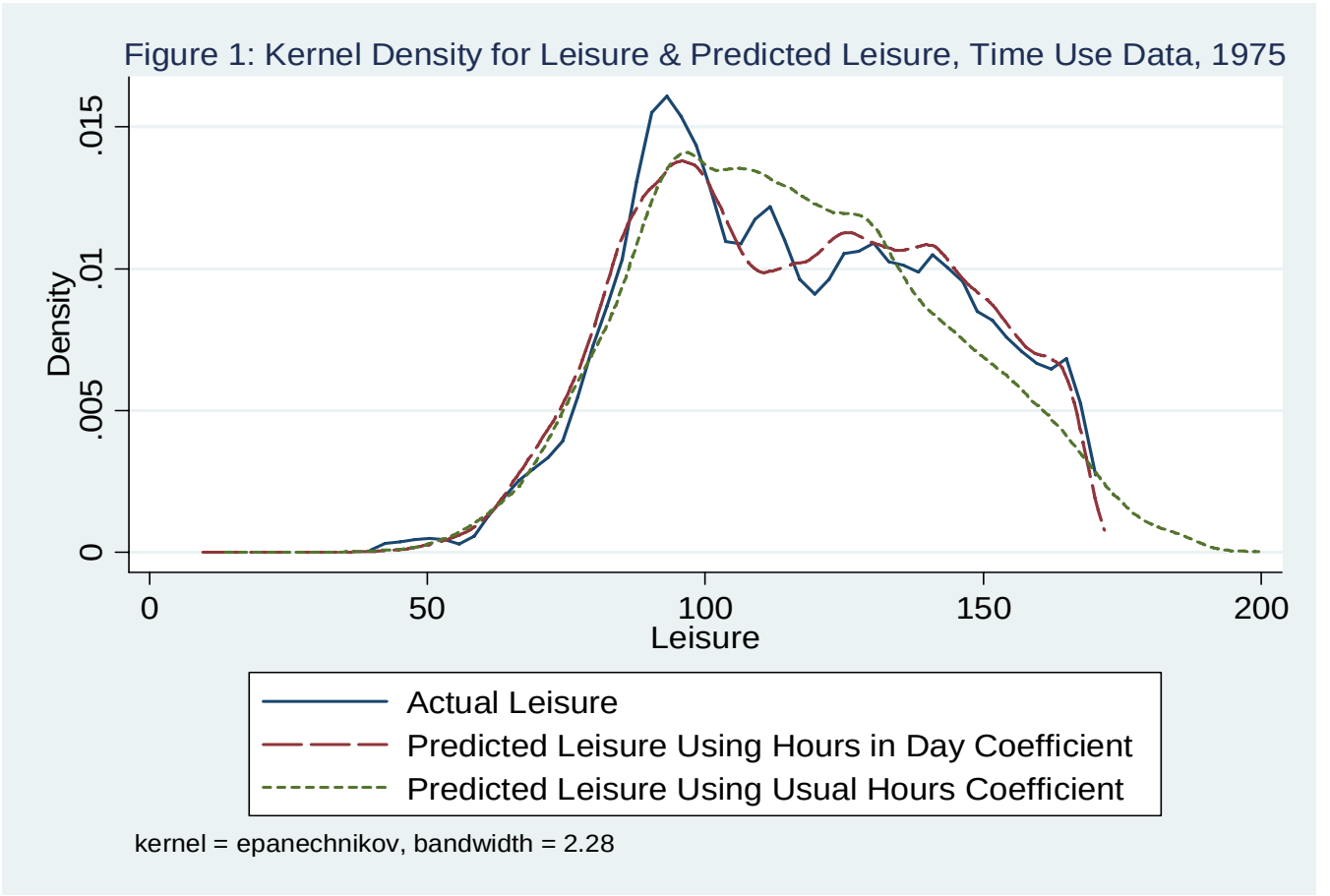
	Consumption			Predicted Leisure			Changes in Consumption (Ratio)			Changes in Leisure (Difference)		
	1972-73	1985	2003	1972-73	1985	2003	1985/ 1972-73	2003/ 1985	2003/ 1972-73	1985 - 1972-73	2003 - 1985	2003 - 1972-73
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Consumption Decile												
First	8,803	9,432	12,714	123.8	123.0	121.6	1.071	1.348	1.444	-0.784	-1.372	-2.156
	(105.3)	(131.8)	(103.8)	(0.265)	(0.268)	(0.229)	(0.020)	(0.022)	(0.021)	(0.377)	(0.352)	(0.350)
Second	13,634	14,859	18,686	120.4	120.7	119.8	1.090	1.258	1.371	0.351	-0.980	-0.630
	(119.5)	(157.9)	(106.1)	(0.255)	(0.330)	(0.238)	(0.015)	(0.015)	(0.014)	(0.417)	(0.407)	(0.349)
Third	16,934	18,971	22,956	118.8	118.0	117.9	1.120	1.210	1.356	-0.816	-0.070	-0.886
	(112.8)	(155.0)	(119.1)	(0.266)	(0.315)	(0.214)	(0.012)	(0.012)	(0.011)	(0.412)	(0.381)	(0.342)
Fourth	19,784	22,397	26,998	117.8	116.2	117.1	1.132	1.205	1.365	-1.507	0.808	-0.699
	(116.8)	(149.8)	(139.6)	(0.227)	(0.311)	(0.220)	(0.010)	(0.010)	(0.011)	(0.385)	(0.381)	(0.316)
Fifth	22,497	25,881	31,190	117.1	115.7	115.8	1.150	1.205	1.386	-1.438	0.171	-1.266
	(117.4)	(168.5)	(145.2)	(0.219)	(0.290)	(0.209)	(0.010)	(0.010)	(0.010)	(0.363)	(0.358)	(0.303)
Sixth	25,352	29,729	35,800	116.3	114.8	115.7	1.173	1.204	1.412	-1.468	0.868	-0.600
	(129.5)	(174.9)	(158.0)	(0.208)	(0.281)	(0.195)	(0.009)	(0.009)	(0.010)	(0.349)	(0.342)	(0.285)
Seventh	28,572	33,780	40,887	116.0	113.2	114.8	1.182	1.210	1.431	-2.852	1.660	-1.192
	(146.3)	(170.7)	(165.2)	(0.182)	(0.293)	(0.185)	(0.009)	(0.008)	(0.009)	(0.345)	(0.346)	(0.259)
Eighth	32,570	39,245	47,371	115.6	113.1	114.2	1.205	1.207	1.454	-2.504	1.100	-1.404
	(152.7)	(234.0)	(202.1)	(0.197)	(0.288)	(0.207)	(0.009)	(0.009)	(0.009)	(0.349)	(0.355)	(0.285)
Ninth	38,326	47,344	57,274	115.6	112.3	113.5	1.235	1.210	1.494	-3.251	1.188	-2.062
	(192.9)	(308.9)	(242.4)	(0.203)	(0.280)	(0.199)	(0.010)	(0.009)	(0.010)	(0.345)	(0.343)	(0.284)
Tenth	55,348	72,495	88,274	115.0	111.7	113.2	1.310	1.218	1.595	-3.313	1.485	-1.827
	(427.9)	(838.8)	(721.8)	(0.176)	(0.251)	(0.205)	(0.018)	(0.017)	(0.018)	(0.307)	(0.324)	(0.271)

Notes: Predicted leisure is determined using hours in day coefficient. Consumption measure excludes health insurance. See notes to Table 5. Bootstrapped standard errors for the means within decile are reported in parentheses.

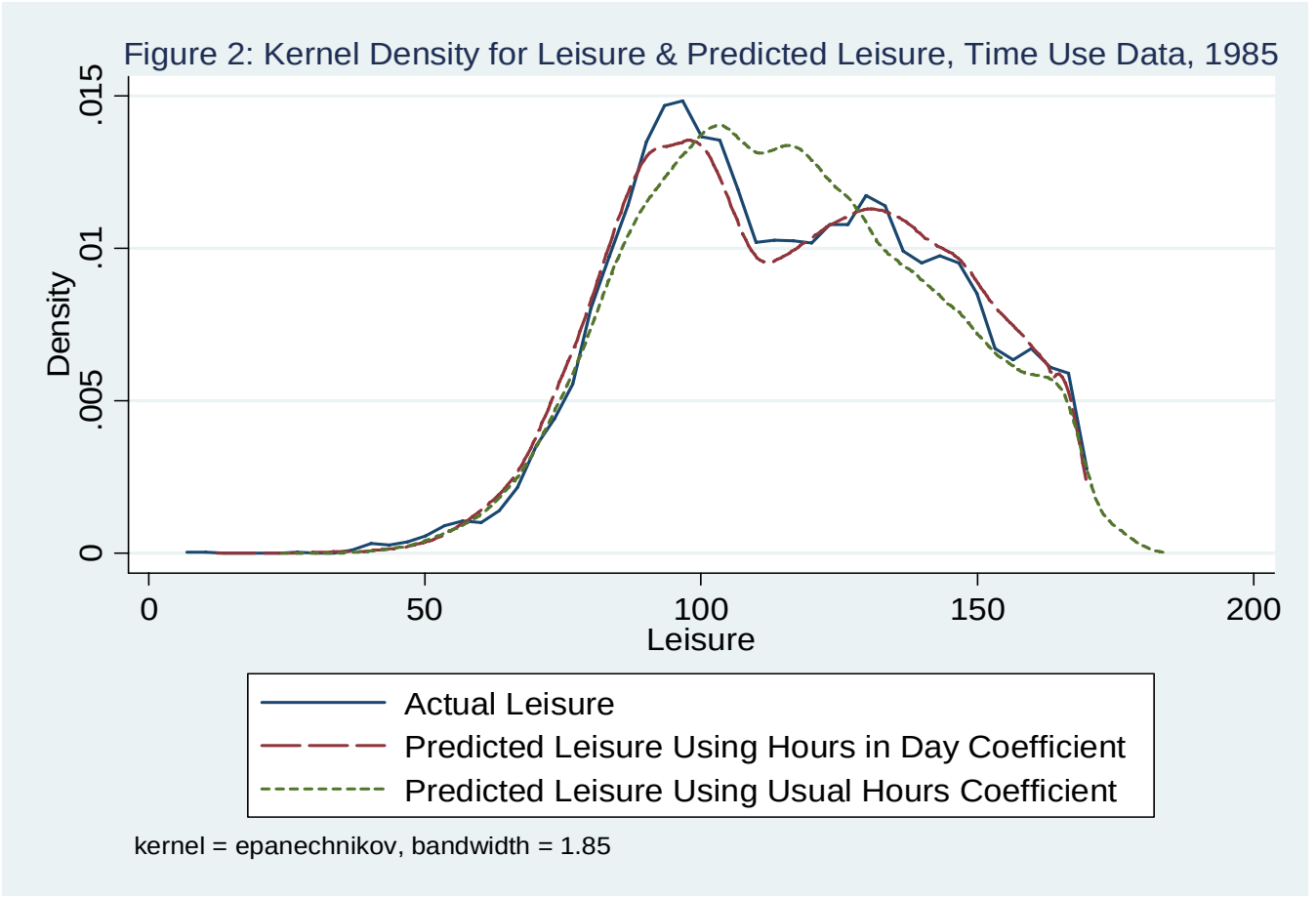
Appendix Table 1: OLS Regressions of Leisure Hours Per Week on Demographic Characteristics and Work, Time Use Surveys

Interaction with	year=1975	year=1985	year=2003	year=1975	year=1985	year=2003	year=1975	year=1985	year=2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Age 25-44	-4.341	-4.183	-3.884	-0.315	1.412	0.654	-0.040	1.743	1.277
	(2.529)	(1.424)	(1.029)	(2.348)	(1.342)	(0.956)	(1.746)	(0.987)	(0.766)
Age 45-54	-3.690	-6.401	-4.695	-0.903	-1.631	-0.966	-2.525	-0.090	-0.050
	(2.892)	(1.693)	(1.088)	(2.628)	(1.566)	(1.004)	(2.057)	(1.136)	(0.810)
Age 55-64	2.911	4.477	1.295	1.462	3.030	-0.118	-0.597	0.262	0.358
	(2.944)	(1.755)	(1.145)	(2.647)	(1.612)	(1.046)	(2.116)	(1.214)	(0.866)
Age 65+	18.630	16.975	17.547	7.412	8.737	4.856	2.676	4.137	3.907
	(3.007)	(1.677)	(1.101)	(2.809)	(1.579)	(1.079)	(2.475)	(1.262)	(0.904)
Male	-1.531	-2.203	-1.762	7.875	2.888	3.698	9.933	6.711	5.284
	(1.459)	(0.802)	(0.448)	(1.505)	(0.781)	(0.426)	(1.117)	(0.570)	(0.339)
Less then HS	0.227	2.770	4.781	-1.348	0.376	1.437	0.052	1.139	1.530
	(1.963)	(1.175)	(0.788)	(1.799)	(1.072)	(0.708)	(1.372)	(0.763)	(0.576)
Some College	-0.877	-2.025	-1.888	-2.827	-2.303	-1.786	-2.843	-1.922	-2.086
	(2.171)	(1.137)	(0.669)	(2.051)	(1.069)	(0.604)	(1.522)	(0.769)	(0.487)
College Grad	-5.794	-2.537	-4.324	-3.523	-1.113	-2.033	-2.796	-2.042	-1.997
	(2.044)	(1.034)	(0.544)	(1.948)	(0.979)	(0.484)	(1.503)	(0.706)	(0.373)
Married	-2.802	-1.221	-1.876	-3.155	-0.568	-1.373	-2.511	-1.770	-2.005
	(1.796)	(0.947)	(0.515)	(1.682)	(0.880)	(0.458)	(1.279)	(0.615)	(0.361)
Number of children under 18	-0.908	-0.352	-0.368	-1.316	-1.101	-0.841	-1.224	-1.392	-1.178
	(0.654)	(0.491)	(0.260)	(0.591)	(0.464)	(0.233)	(0.420)	(0.327)	(0.185)
Number of adults in family	0.481	0.282	-0.343	-0.241	0.159	-0.681	-0.692	0.111	-0.441
	(1.126)	(0.395)	(0.311)	(1.161)	(0.367)	(0.284)	(0.874)	(0.269)	(0.224)
Number of children under 5	4.766	1.301	2.148	3.723	1.336	1.458	1.751	0.950	1.558
	(1.593)	(0.991)	(0.362)	(1.440)	(0.908)	(0.323)	(1.077)	(0.630)	(0.246)
Usual hours worked per week				-0.565	-0.489	-0.573			
				(0.039)	(0.020)	(0.012)			
Hours worked on interview day*7							-0.634	-0.645	-0.630
							(0.018)	(0.009)	(0.006)
Survey Year = 1985		-2.740			-5.199			-2.140	
		(4.196)			(3.931)			(3.074)	
Survey Year = 2003			0.907			2.851			2.094
			(3.863)			(3.635)			(2.878)
N			23,363			23,363			23,363
R^2			0.20			0.32			0.60

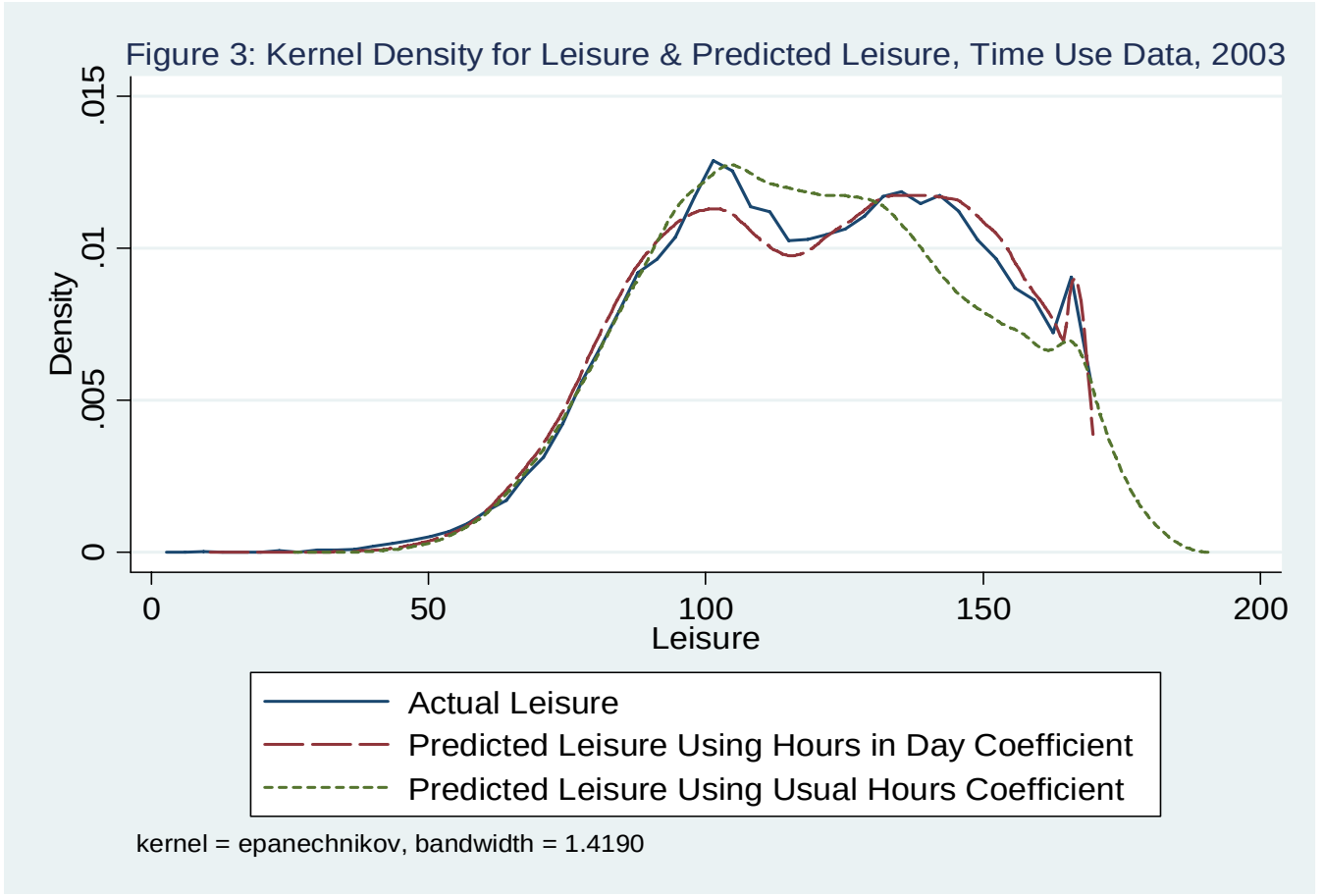
Notes: The sample for these regressions is the same as in column 1 of Table 1. See note to Table 1 for more details. Standard errors are reported in parentheses.



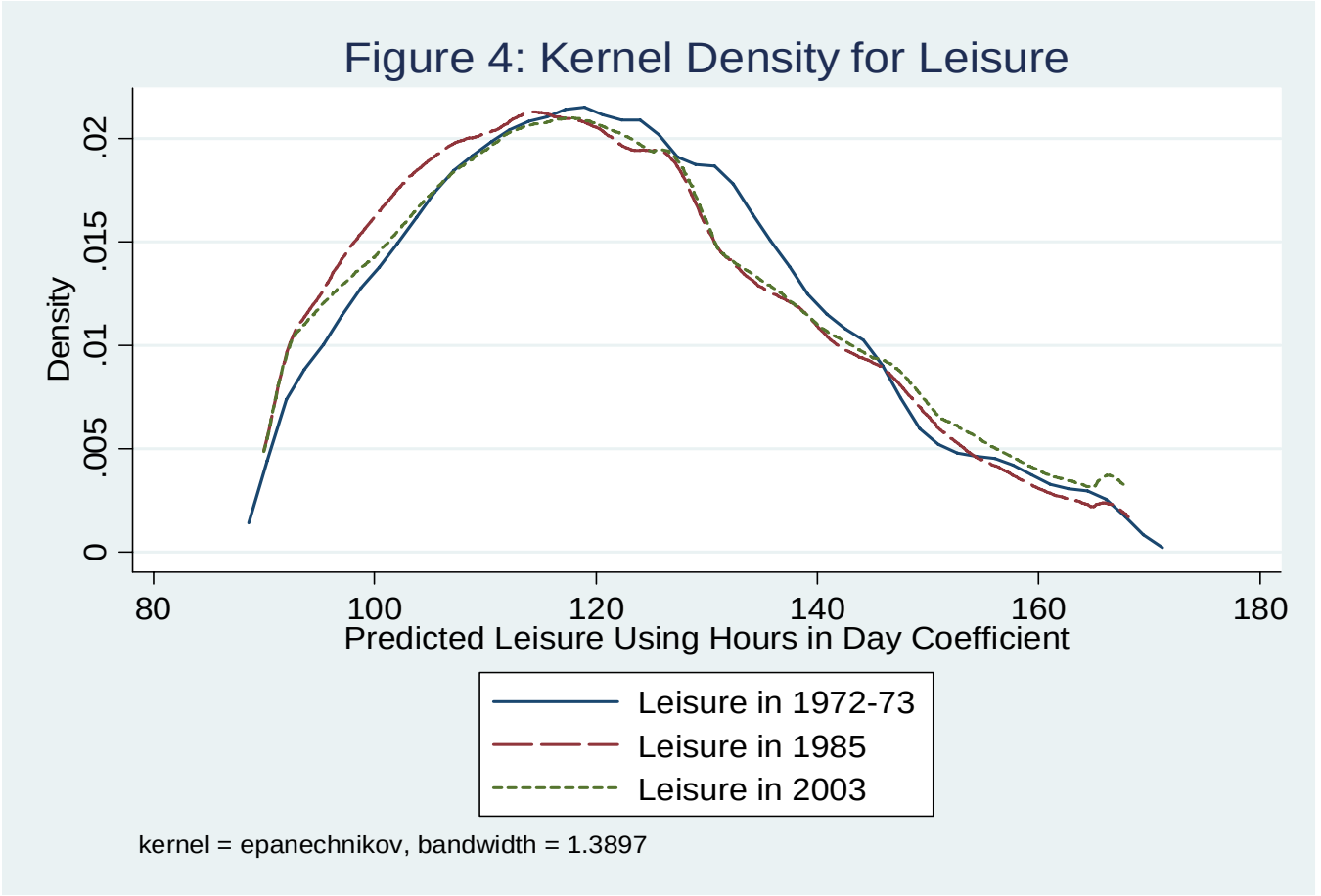
Notes: Predicted leisure is determined using the predicted value of leisure for each observation for each of 99 quantile regressions. See text for more details.



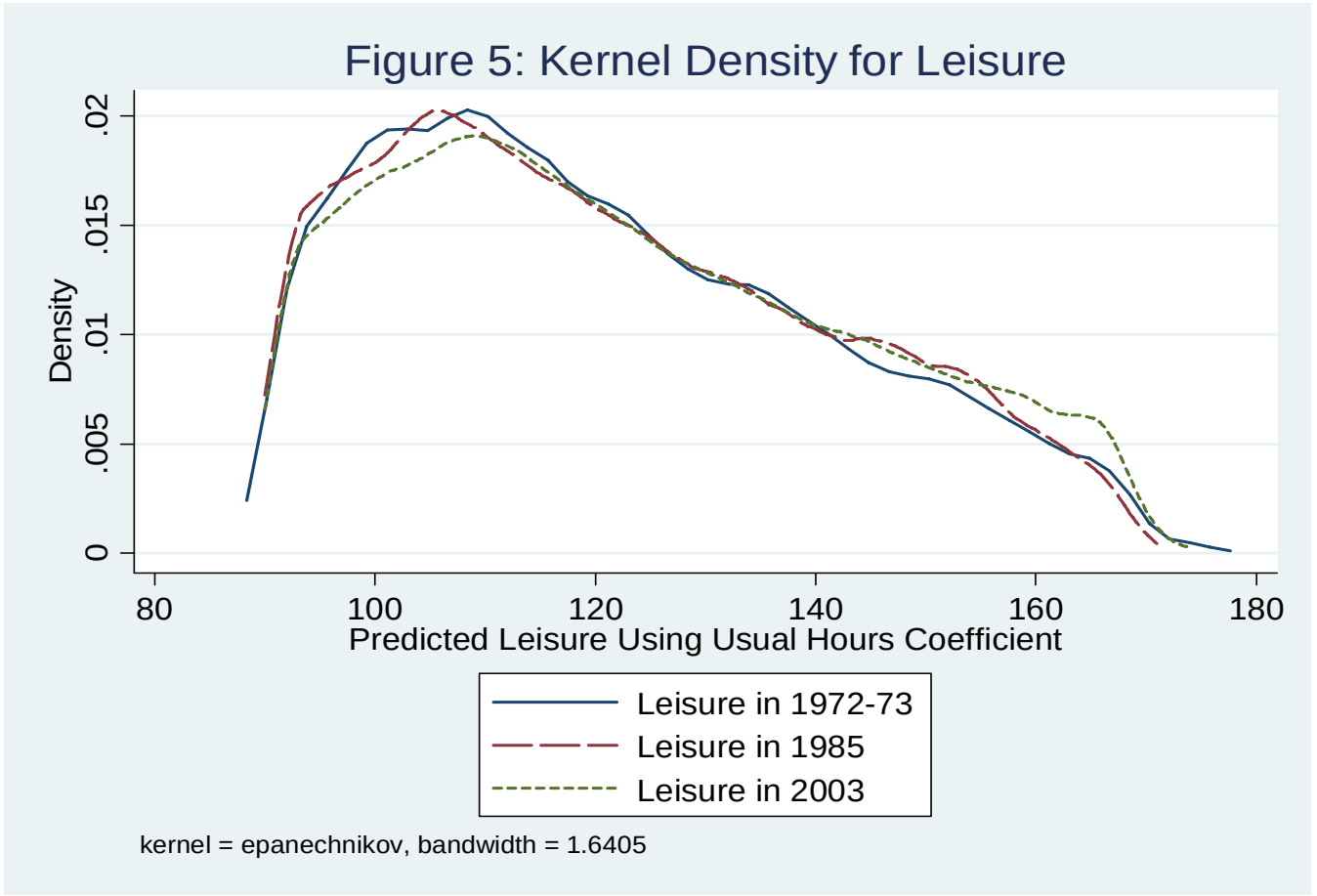
Notes: See notes to Figure 1.



Notes: See notes to Figure 1.

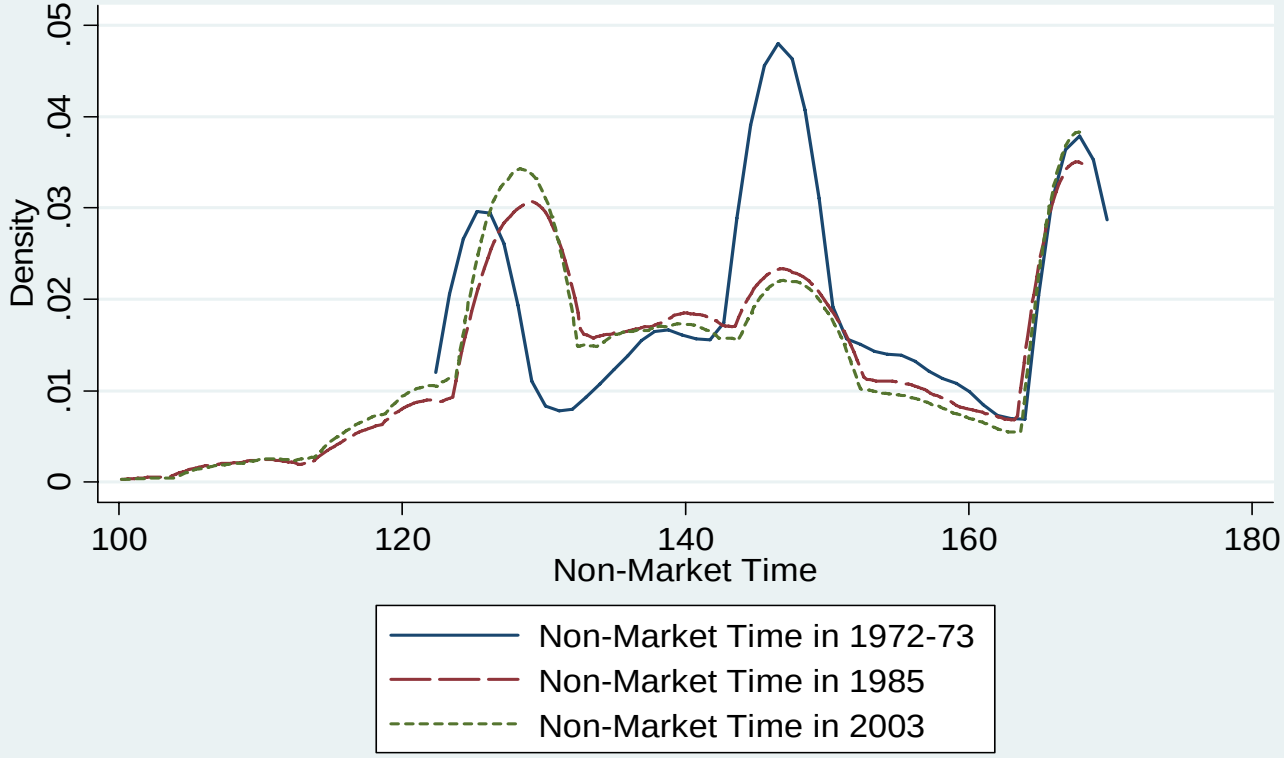


Notes: Data are from various years of the CE Survey. See notes to Table 5.

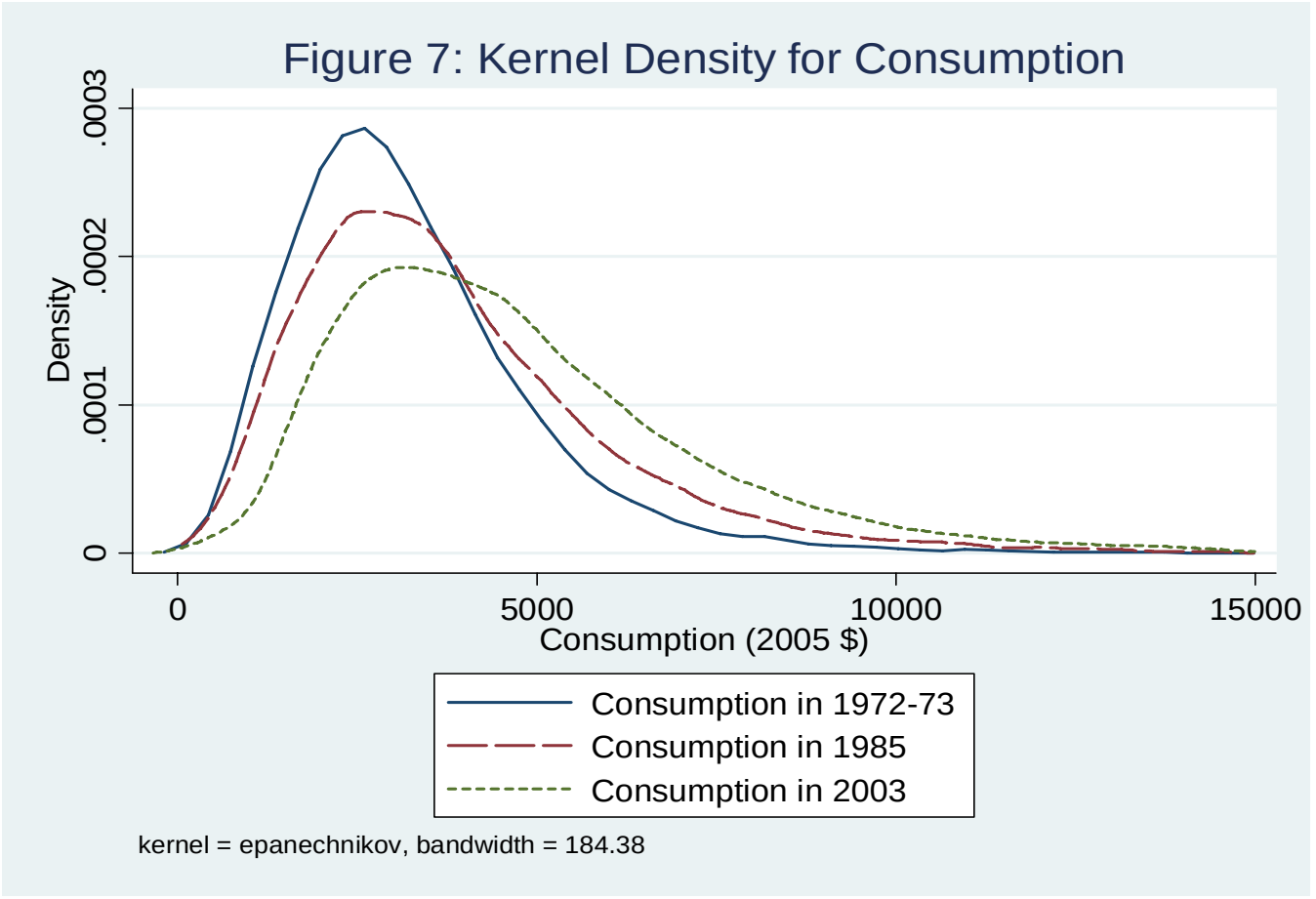


Notes: Data are from various years of the CE Survey. See notes to Table 5.

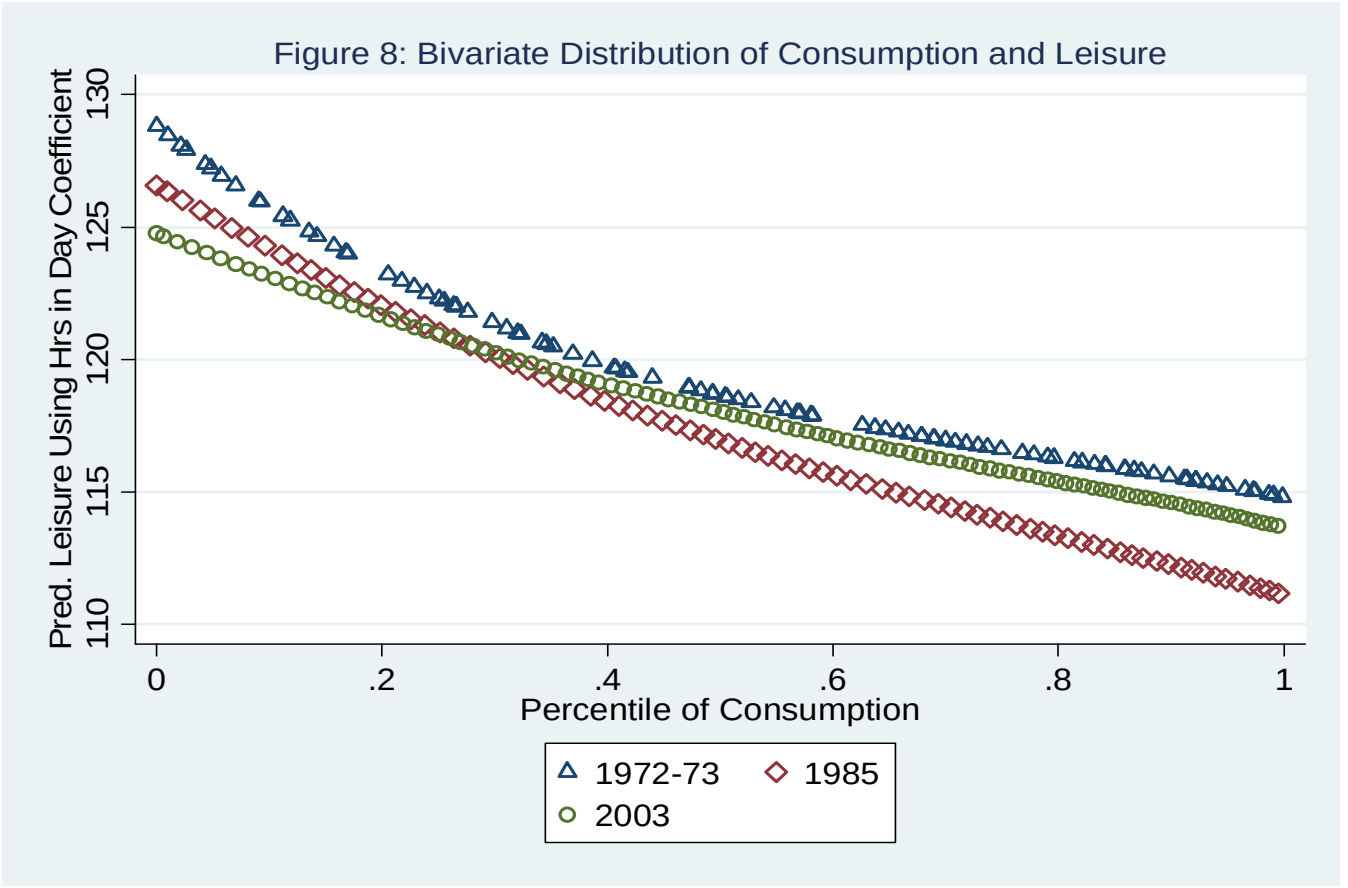
Figure 6: Kernel Density for Non-Market Time



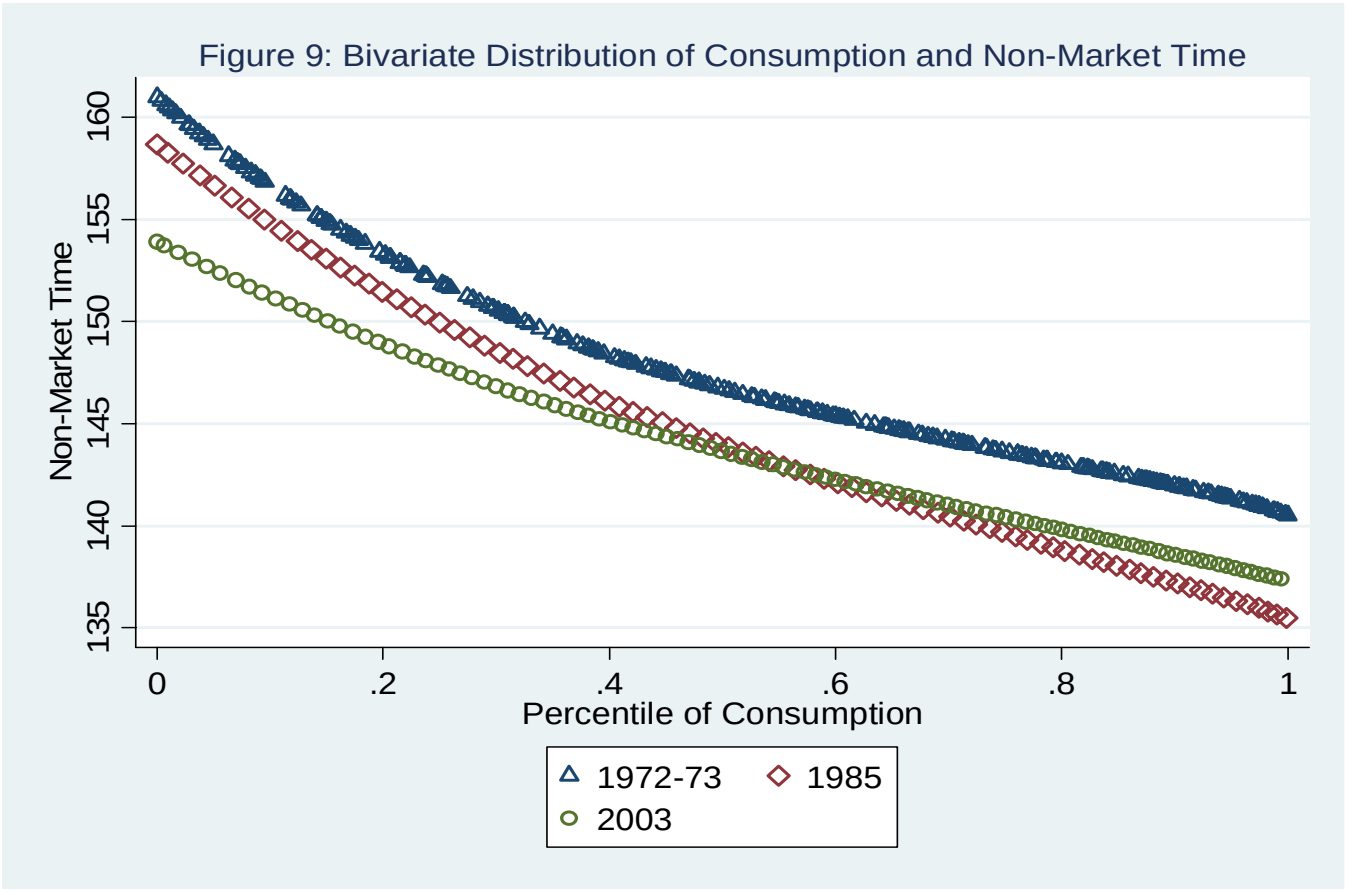
Notes: Data are from various years of the CE Survey. See notes to Table 5.



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