

**Testing Intertemporal Substitution, Implicit Contracts, and Hours Restriction Models of  
the Labor Market using Micro Data**

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## Data Appendix

### *A. The Panel Study of Income Dynamics, 1972-1992*

We use both the November 1993 and the December 1995 (ICPSR 7439) Respondents and Non-Respondents CD-ROMs of the Panel Study of Income Dynamics (PSID). The data files are issued by the Inter-University Consortium for Political and Social Research and distributed in the United Kingdom by the Economic and Social Research Council Data Archive at the University of Essex. Data for 1972 to 1988 comes from the November 1993 CD-ROM and for 1989 to 1992 from the December 1995 CD-ROM.

The data structure is year-by-year family variables files and a 21-year compilation of the individual-level variables. With this structure we implement a three-step procedure to generate the subsamples of the PSID that were used in the analysis. Step 1: For each year from the individual file we choose all the male heads of PSID families that are between 23 and 60 of age who responded in that year.<sup>2</sup> The individual-level information is then merged with the family variables associated with this head. This results in 21 yearly Family-Individual variable files, and the numbers of surviving observations (by year) are listed in column (3) of Table A.1.

Step 2: We combine these 21 yearly files into one file and impose the restriction that only those individuals with three or more continuous observations are retained. Given the timing of variables, we need three consecutive years to obtain the variables necessary for one first-difference observation in the regression. The effect of this restriction on observations by year is

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<sup>1</sup> This appendix will be made available at the authors web sites.

<sup>2</sup> The age restriction varied depending on the wave of the PSID being considered. In the early years we restricted the upper limit to younger than 60 since at the next stage we were going to impose the three years-of-data requirement. For example an individual age 58 in 1968 would not be able to generate the minimum three observations required at age 60. Therefore, this individual was excluded at this stage.

listed in column (4) of Table A.1. The number of observations available at this point is 78,737 from 7,764 different male respondents.

Step 3: Impose on each observation a number of restrictions (Table A.2). These restrictions are the standard missing value ones and, in the case of variables in which logarithms are taken, a positive value must be available. Columns (2) and (3) of Table A.2 report the sample in terms of the number of individuals and observations after a restriction is imposed. To replicate Table A.2 exactly, one would have to follow the exact order of restrictions as presented. This results in a sample of 49,780 observations on 6,834 individuals, used for the results reported in Tables 1 and 5 of the paper.

Imposing further restrictions on the group that formed the basis of the analysis in Table 1 then produces three more subsamples. The restrictions imposed and their effects on sample size are reported in Table A.2. Table A.3 presents descriptive statistics on the four samples from the PSID that are used in this study.

Two issues related to our handling of the PSID need to be addressed. First, we match unemployment rates according to the information on industry and occupation provided by the individual in that interview year. Information on occupation and industry are first available in the 1971 wave, and thus our first observation for the change in log hours is dated for the year 1972. The PSID has consistently used the 1970 Census of Population classification system for both industry and occupation. Unemployment rates for these industry and occupation classifications were obtained from Bureau of Labor Statistics (BLS). The PSID offers two-digit industry classification from 1971 to 1979 and three-digit classification thereafter. To keep our series consistent we convert the three-digit industry to two-digit after 1979. The occupation information has varied in the detail available across the sample period, but only the one-digit

occupation classification is available for all years. Thus we also converted later occupation categories to the one digit level.<sup>3</sup> We use the first and second lags of the unemployment rates as instruments. The first and second lag of the unemployment rates are based on the industry or occupation in period  $t-1$ .

The second issue relates to our handling of the food expenditure information in the PSID. Before 1980, this variable is the summation of four variables: food expenditures at home, food expenditures away from home, the bonus value of food stamps used, and the price paid for food stamps. For 1980 and thereafter, it is the summation of three variables: food expenditures at home, food expenditures away from home, and food stamp bonus value. The food stamp information is unambiguously dated for the year prior to the interview date, reflecting the change in the food stamp program.<sup>4</sup> The dating of the food at home and food away from home expenditure variables is ambiguous. In both questions the individual is asked about average expenditures on these two types of food expenditures and the actual frame for the expenditure is not specified in the question.<sup>5</sup> This opens up the problem of how to date the annualized variables that are reported in the PSID. We follow Altonji (1986) and Hayashi, Altonji, and Kotlikoff (1996) and treat the annualized food expenditure information as being for the current year.

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<sup>3</sup> Between 1971 and 1975, only one-digit occupation classification is available. For 1976 to 1980, the reported occupation is at the two-digit level. For 1981 and thereafter, three-digit occupation is available. We re-estimated the model for 1976 to 1992 using the two-digit occupation classification. None of our results changed. The results are available on request.

<sup>4</sup> Because of a change in the operation of the food stamp program in the late 1970s, the question on how much individuals paid for their food stamps was dropped with the 1980 interview year. Further, the question on amount paid for food stamps was not asked in the 1972 wave, so that variable has not been included in the food expenditure calculation for that year. The two food expenditure questions were asked in every year between 1972 and 1992 except for 1973, 1988, and 1989. The question on bonus value of food stamps has been asked in every year except for 1973.

<sup>5</sup> From the 1985 wave the food at home question is: How much do you (or anyone else in your family) spend on food that you use at home in an average week? The food away from home question is: About how much do you (and everyone else in your family) spend on eating out, not counting meals at work or at school? (Duncan and Morgan 1988 p. 43).

*B. The Consumer Expenditure Survey, 1984-1992*

The Consumer Expenditure Survey is conducted by the Bureau of the Census for the Bureau of Labor Statistics (BLS). The data used in this paper were obtained from the Inter-University Consortium based at the University of Michigan. Consumer Expenditure Survey has two parts: a survey of quarterly consumption, the Interview Survey; and a Diary Survey, which tracks detailed expenditures over a two-week period. This second survey is concerned with high frequency purchases. The Diary's non-standard time frame and its focus on high frequency purchases are the reasons we have not utilized it in this study.

The CES has been conducted on a regular basis since October 1979 and intermittently prior to that time. The population base of the CES is the United States. From the third quarter 1981 to fourth quarter 1983, the CES, for budgetary reasons, was restricted to the urban population of the United States. This is one of the reasons that we decided against using the data prior to 1984.

Before discussing the CES further we require two definitions. The unit of analysis for the CES is not the individual but what is referred to as the Consumer Unit (CU). It is defined as:

*(1) all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements; (2) a person living alone or sharing a household with others or living as a roomer in a private home or lodging house or in permanent living quarters in a hotel or motel, but who is financially independent; or (3) two or more persons living together who pool their income to make joint expenditure decisions. Financial independence is determined by the three major expense categories: Housing, food, and other living expenses. To be considered financially independent, at least two of the three major expense categories have to be provided by the respondent. (Bureau of Labor Statistics 2000)*

The notion of a Consumer Unit ranges beyond the traditional nuclear family. Its focus is on the unit's financial interdependence. Narrower and more restrictive definitions of the family would

not reflect the decision-making process we are modelling. The second term is the reference person, and the CES defines this individual as:

*The first member mentioned by the respondent when asked to "Start with the name of the person or one of the persons who owns or rents the home."*  
(Bureau of Labor Statistics 2000)

The reference person is not the PSID head (always the male "spouse" in the unit if there is one) but rather the individual first mentioned by the respondent. When examining the CES for observations, we need to look at both the reference person and spouse information to find the male in the CU. This strategy yields an equivalent observation from the CES as selecting on the basis of the male head in the PSID.

In the first quarter of 1986, the BLS introduced a new set of identification numbers for Consumer Units. These identification numbers and the earlier ones are not linked in one list. Previous researchers (Nelson 1992; Attanasio and Weber 1995) have used demographic characteristics to match observations across this period. This strategy introduces the possibility of matching error and for this reason we pursue an alternative. We use the prerelease version of the first quarter of 1986 that contains the old identification number to include this quarter in our sample. We then begin collecting observations in the final quarter of 1986 when we have a full set of responses from Consumer Units with the new identification number.

The BLS releases the public access files on a yearly basis using a standard quarterly structure for a year that is outlined in Table B1. There are three types of files associated with the Interview Survey: the Consumer Unit Characteristic and Income (FMLY) file, the Detailed Family Expenditure (EXPN) file, and the Member (MEMB) file. The FLMY file that includes demographic, income, and asset information at the CU level. Since the first quarter 1984, this file has also included summary expenditure information for standard consumption categories. The

EXPN file breaks down by month and Universal Classification Code expenditures made by the Consumer Unit. This file is of interest if your focus is the consumption pattern of a particular good or if you want to construct consumption categories that differ from those provided in the FMLY file. The MEMB file contains demographic, income, and labour supply information for all members of the CU.

In this paper we are concerned with well-defined expenditure categories by the CU and individual labor supply decisions. Therefore, we use information from both the FMLY and MEMB files for first quarter 1984.1 to fourth quarter 1992. After 1992 the BLS stopped reporting the individual's industry in which most of the earnings were obtained in the previous 12 months.

Consumer Units are interviewed five times over a 12-month period. The first interview contains basic information that is used by the BLS to check for consistency of information provided in the final four interviews. The BLS does not release the results of this interview. The first publicly available data are for interview two, and the final interview is number five. During a given quarter, one-third of the Consumer Units are interviewed each month. They are replaced if they drop out of the sample before their final interview. In every quarter, one-quarter of the sample will be on their final interview and will be replaced with a new unit in the next quarter.

The information collected from the Consumer Unit and individuals in the CES is given in Table B.1. Expenditure information is collected at each interview; the labor supply information is collected in the second and fifth interviews only. Table B.2 shows how the BLS codes expenditure information by the Consumer Unit. For this paper we need annual measures of consumption, so we will require that the CU respond to all of the publicly available interviews. In constructing our measures of consumption, we have followed other authors (for example,

Attanasio and Weber 1995). We follow the National Income and Products Accounts (Department of Commerce 1990) to create our food and beverage expenditures and nondurable and services expenditures (net of food and beverage expenditures) variables. Table B.3 provides a detailed breakdown of the variables in the Consumer Expenditure Survey we are using and their underlying Universal Classification Category. Conversion into real terms is done using BLS price deflators (Table B.4).

As Table B.1 indicates, the necessary labor supply information (hours, wages, occupation and industry) is collected in interviews two and five. The information collected in both interviews is retrospective information for the previous twelve months. With only nine months between these two interviews, they will overlap by three months. A standard first-difference in hours comparables to the one from the PSID data cannot be calculated. For the estimation of the QMRS equation, we use the information obtained in the fifth interview for the individual's current labor supply information. This CES interview is the only one that allows for contemporaneously observed annual consumption expenditure and labor supply hours. There are two possible measures of the hourly wage rate in the MEMB file of the CES. The first is obtained by dividing before tax annual labor earnings by the product of usual hours per week variable times weeks worked variable. This variable closely matches the method used by the PSID and is our primary measure of average hourly earnings. The second measure that is also available in the MEMB file is before tax labor earnings in the previous period, where the period is provided by the individual (hourly, weekly, monthly, etc.). If we were unable to calculate the wage using the annual measure, we included the observation using this measure of the average wage rate. This procedure on average increased the number of observations from a given quarter

by around 10. Results available on request show that exclusion of these observations does not change the conclusions of this paper.

Tables B.5 and B.6 match occupation and industry categories to BLS unemployment series and CES codes. For occupation coding in the CES, there is a one-to-one match with the BLS unemployment series; however, for industry we are required to make two modifications in the matching process to obtain consistent series.

The CES combines Agriculture with Forestry & Fisheries and Mining industries; the BLS does not report a Mining unemployment series for this period and reports Agriculture and Forestry & Fisheries as separate series. To create an unemployment series for this CES category, we use an Employment Level (LFU11102000000: Employment Level Agriculture and LFU11103000000: Employment Level Forestry and Fisheries) weighted average of the two unemployment rates we do have. The second modification is needed because of the CES coding of Other Services. As a proxy unemployment rate, we use the Miscellaneous Services series produced by the BLS.

The actual unemployment rate used the average unemployment rate for the 12 months prior to the month of the fifth interview. The lagged unemployment rates are based on the industry and occupation reported in the second interview. Calculations are the same as the current unemployment rates.

Table B.7 provides a quarter by quarter accounting of how we generate the CES sample reported in the paper. As column (3) shows, on average one-quarter of the Consumer Units were on their final interview. We lose a little more than half of the observations in column (3) because the CU does not contain either a male reference person or spouse or the labor supply information is missing (column (4)). A further 35 percent of the observations were lost because of an

inability to calculate the consumption measures, invalid occupation or industry classification in interview two, or because their interview two age was less than 23 or greater than 60. At this point we have a potential sample of 11,532 (Column (5)). Following Altonji (1986) we impose minimal outlier restrictions. We use level restrictions only since a first-difference estimation is not possible due to the time inconsistency problem associated with the labor supply information obtained in the second interview discussed above. We eliminate all observations with a real wage less than \$1.00 and real annual food expenditures that are less than or equal to \$500 or greater than or equal to \$10,000. This results in average loss of 10 observations per quarter (Column (6)) and yields the sample reported in the paper of 11,290 males.

Our education measure is the one reported in interview two and the family size measure is that reported in interview 5. Finally, Table B.8 reports descriptive statistics on our key variables.

#### **DATA APPENDIX REFERENCES**

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**Table A.1**  
**Restrictions on Sample Size by Year of Interview**

| <b>Year</b>  | <b>(1)</b>     | <b>(2)</b>    | <b>(3)</b>    | <b>(4)</b>     |
|--------------|----------------|---------------|---------------|----------------|
| <b>1972</b>  | 5,060          | 2,776         | 2,620         | - <sup>a</sup> |
| <b>1973</b>  | 5,285          | 2,898         | 2,841         | 1,830          |
| <b>1974</b>  | 5,517          | 3,000         | 2,944         | 1,912          |
| <b>1975</b>  | 5,725          | 3,135         | 3,079         | 1,942          |
| <b>1976</b>  | 5,862          | 3,246         | 3,193         | 2,002          |
| <b>1977</b>  | 6,007          | 3,371         | 3,314         | 2,107          |
| <b>1978</b>  | 6,154          | 3,502         | 3,439         | 2,281          |
| <b>1979</b>  | 6,373          | 3,625         | 3,558         | 2,379          |
| <b>1980</b>  | 6,533          | 3,748         | 3,669         | 2,455          |
| <b>1981</b>  | 6,620          | 3,781         | 3,712         | 2,522          |
| <b>1982</b>  | 6,742          | 3,835         | 3,776         | 2,518          |
| <b>1983</b>  | 6,852          | 3,873         | 3,808         | 2,514          |
| <b>1984</b>  | 6,918          | 3,964         | 3,884         | 2,560          |
| <b>1985</b>  | 7,032          | 4,062         | 3,994         | 2,618          |
| <b>1986</b>  | 7,018          | 4,073         | 4,005         | 2,691          |
| <b>1987</b>  | 7,061          | 4,101         | 4,040         | 2,766          |
| <b>1988</b>  | 7,114          | 4,136         | 4,076         | 2,720          |
| <b>1989</b>  | 7,114          | 4,142         | 4,092         | 2,803          |
| <b>1990</b>  | 9,371          | 5,345         | 5,067         | 2,819          |
| <b>1991</b>  | 9,363          | 5,317         | 4,880         | 2,817          |
| <b>1992</b>  | 9,829          | 5,579         | 4,746         | 3,524          |
| <b>Total</b> | <b>143,550</b> | <b>81,509</b> | <b>78,737</b> | <b>49,780</b>  |

*Column (1): Total number of PSID families available for selection in a given year.*

*Column (2): Column (1) respondents who are male heads of a PSID that meet the age restriction for that year.*

*Column (3): Column (2) respondents who provided at least one period of three or more continuous years worth of data.*

*Column (4): Column (3) respondents who satisfied the detailed sample inclusion restrictions presented in Table A.2.*

**a.** No observation available for this interview year due to availability of lagged instrument.

**Table A.2**  
**Derivation of the PSID Samples**

*(A) Labor Supply Growth Equation Samples.*

| <b>Restriction</b>                                                                                                                 | <b>Individuals</b> | <b>Observations</b> | <b>Tables</b>  |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|----------------|
| <b>PSID Totals (one observation per family)</b>                                                                                    | -                  | 143,550             |                |
| <b>Sample after basic restrictions</b>                                                                                             | 7,764              | 78,737              |                |
| <b>Eliminate 1992 Observations</b>                                                                                                 | 7,764              | 73,991              |                |
| <b>Eliminate observations in which hours and wage difference cannot be calculated</b>                                              | 7,764              | 70,804              |                |
| <b>Eliminate observations with zero hours worked</b>                                                                               | 7,599              | 67,136              |                |
| <b>Eliminate observations in which the number of hours worked provided by PSID staff</b>                                           | 7,572              | 65,864              |                |
| <b>Eliminate observations in which hours worked was more than 4860</b>                                                             | 7,572              | 65,688              |                |
| <b>Eliminate observations in which hours growth was greater than 250 percent and less than -60 percent</b>                         | 7,453              | 55,217              |                |
| <b>Eliminate observations in which real wage growth was greater than 250 percent and less than -60 percent</b>                     | 7,389              | 60,437              |                |
| <b>Eliminate observations in which real wage was less than or equal to \$1.</b>                                                    | 7,389              | 60,344              |                |
| <b>Eliminate observations in which absolute change in real wage was more than \$30</b>                                             | 7,382              | 60,270              |                |
| <b>Eliminate observations in which industry information was missing or individual was in industry not considered</b>               | 7,118              | 53,428              |                |
| <b>Eliminate observations in which one digit occupation information was missing or individual was in occupation not considered</b> | 6,877              | 49,970              |                |
| <b>Eliminate observations in which head's years of education was missing</b>                                                       | 6,843              | 49,793              |                |
| <b>Eliminate observations in which wife's hours worked was more than 4,860</b>                                                     | 6,843              | 49,780              |                |
| <b>The sample after basic restrictions</b>                                                                                         | <b>6,843</b>       | <b>49,780</b>       | <b>1 and 5</b> |
| <b>Eliminate observations in which we were not able to calculate either a lead or lagged change in log real average wage</b>       | <b>5,489</b>       | <b>41,758</b>       | <b>1</b>       |

*(B) QMRS Equation Samples*

| <b>Restriction</b>                                                                                                                    | <b>Individuals</b> | <b>Observations</b> | <b>Tables</b>  |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------|----------------|
| <b>The sample after basic restrictions</b>                                                                                            | 6,843              | 49,780              | 1              |
| <b>Eliminate observations in which PSID staff provided food numbers</b>                                                               | 6,825              | 49,434              |                |
| <b>Eliminate observations in which real food expenditure growth was greater than 250 percent and less than -60 percent</b>            | 6,338              | 35,808              |                |
| <b>Eliminate observations in which real food expenditure per individual per week in the family was less \$1 or greater than \$100</b> | 6,316              | 35,405              |                |
| <b>Eliminate observations in which real annual food expenditure was less than \$500 and greater than \$10,000</b>                     | 6,283              | 34,663              |                |
| <b>The basic QMRS sample after restrictions</b>                                                                                       | <b>6,283</b>       | <b>34,663</b>       | <b>2 and 4</b> |
| <b>Eliminate observations in which we were not able to calculate either a lead or lagged change in log real average wage</b>          | 5,125              | 29,741              | 2              |

**Table A.3: Descriptive Statistics on Key Variables in PSID Sample***(A) Labor Supply Growth, Complete Sample: Tables 1 and 5*

| <b>Variable</b>                                                                       | <b>Mean</b> | <b>Standard Deviation</b> |
|---------------------------------------------------------------------------------------|-------------|---------------------------|
| <b>Average Hourly Wage<sup>a</sup></b>                                                | 10.60       | 7.89                      |
| <b>Annual Hours of Labor Supply<sup>b</sup></b>                                       | 2,196.08    | 558.07                    |
| <b>Annual Hours of Labor Supply if Annual Hours of Unemployment Equals Zero</b>       | 2,269.69    | 521.56                    |
| <b>Annual Hours of Labor Supply if Annual Hours of Unemployment Greater than Zero</b> | 1,762.19    | 568.89                    |
| <b>Annual Hours of Unemployment if Hours of Unemployment Greater Than Zero</b>        | 412.53      | 359.38                    |
| <b>Current Two-Digit Industry Unemployment Rate<sup>d</sup></b>                       | 6.28        | 2.98                      |
| <b>Current One-Digit Occupation Unemployment Rate<sup>e</sup></b>                     | 6.11        | 3.29                      |
| <b>Number of Observations</b>                                                         | 49,780      |                           |
| <b>Number of Individuals</b>                                                          | 6,843       |                           |
| <b>Observations per Individual</b>                                                    | 7.27        |                           |
| <b>Observations With Positive Unemployment Hours</b>                                  | 7,220       |                           |
| <b>Individuals With Positive Unemployment Hours</b>                                   | 2,805       |                           |
| <b>Observations per Individual With Positive Unemployment Hours</b>                   | 2.57        |                           |

**Notes:** **a.** Annual labor earnings divided by annual hours of labor supply in all jobs. Deflate using the Urban Consumers, All Items Consumer Price Index (Base 1982-84=100). See *1996 Economic Report of the President*, Table B-56, p. 343, Washington D.C.: Government Printing Office.

**b.** Head's annual hours on all jobs.

**c.** Sum of Food Expenditures at Home, Food Expenditures Away from Home, Bonus Value of Food Stamps, and the cost of Food Stamps in all years when this information was available or relevant. Deflated using Urban Consumers, Food Consumer Price Index, Excluding Alcoholic Beverages (Base is 1982-84=100) See *1996 Economic Report of the President*, Table B-57, p. 344, Washington D.C.: Government Printing Office.

**d.** Industry assignment based on coding developed for the 1970 Census of Population. If an individual was unemployed at the time of the interview, then the industry in their previous job is used.

**e.** Occupation assignment based on coding developed for the 1970 Census of Population. If an individual was unemployed at the time of the interview, then the occupation in their previous job is used.

*(B) QMRS, Complete Sample: Tables 2 and 4*

| <b>Variable</b>                                                                       | <b>Mean</b> | <b>Standard Deviation</b> |
|---------------------------------------------------------------------------------------|-------------|---------------------------|
| <b>Average Hourly Wage<sup>a</sup></b>                                                | 10.35       | 7.07                      |
| <b>Annual Hours of Labor Supply<sup>b</sup></b>                                       | 2186.36     | 549.35                    |
| <b>Annual Hours of Labor Supply if Annual Hours of Unemployment Equals Zero</b>       | 2,260.91    | 512.96                    |
| <b>Annual Hours of Labor Supply if Annual Hours of Unemployment Greater than Zero</b> | 1,765.54    | 558.24                    |
| <b>Annual Hours of Unemployment if Hours of Unemployment Greater Than Zero</b>        | 407.46      | 357.21                    |
| <b>Annual Food Expenditures<sup>c</sup></b>                                           | 4061.55     | 1938.85                   |
| <b>Current Two-Digit Industry Unemployment Rate<sup>d</sup></b>                       | 6.70        | 3.10                      |
| <b>Current One-Digit Occupation Unemployment Rate<sup>e</sup></b>                     | 6.50        | 3.40                      |
| <b>Observations</b>                                                                   | 34,663      |                           |
| <b>Individuals</b>                                                                    | 6,283       |                           |
| <b>Observations per Individual</b>                                                    | 5.52        |                           |
| <b>Observations With Positive Unemployment Hours</b>                                  | 5,216       |                           |
| <b>Individuals With Positive Unemployment Hours</b>                                   | 2,327       |                           |
| <b>Observations per Individual With Positive Unemployment Hours</b>                   | 2.24        |                           |

*See Notes Table A.3 Part (A)*

*(C) Labor Supply Growth Intertemporal Nonseparable Preferences: Table 1*

| <b>Variable</b>                                                                       | <b>Mean</b> | <b>Standard Deviation</b> |
|---------------------------------------------------------------------------------------|-------------|---------------------------|
| <b>Head's Average Hourly Wage<sup>a</sup></b>                                         | 10.57       | 7.64                      |
| <b>Head's Annual Hours of Labor Supply<sup>b</sup></b>                                | 2,206.12    | 547.95                    |
| <b>Annual Hours of Labor Supply if Annual Hours of Unemployment Equals Zero</b>       | 2,276.13    | 513.68                    |
| <b>Annual Hours of Labor Supply if Annual Hours of Unemployment Greater than Zero</b> | 1,780.98    | 557.43                    |
| <b>Annual Hours of Unemployment if Hours of Unemployment Greater Than Zero</b>        | 398.94      | 348.39                    |
| <b>Current Two-Digit Industry Unemployment Rate<sup>d</sup></b>                       | 6.29        | 3.01                      |
| <b>Current One-Digit Occupation Unemployment Rate<sup>e</sup></b>                     | 6.08        | 3.36                      |
| <b>Observations</b>                                                                   | 41,758      |                           |
| <b>Individuals</b>                                                                    | 5,489       |                           |
| <b>Observations per Individual</b>                                                    | 7.61        |                           |
| <b>Observations With Positive Unemployment Hours</b>                                  | 5,904       |                           |
| <b>Individuals With Positive Unemployment Hours</b>                                   | 2,287       |                           |
| <b>Observations per Individual With Positive Unemployment Hours</b>                   | 2.58        |                           |

*See Notes Table A.3 Part (A)*

*(D) QMRS Intertemporal Nonseparable Preferences: Table 2*

| <b>Variable</b>                                                                           | <b>Mean</b> | <b>Standard<br/>Deviation</b> |
|-------------------------------------------------------------------------------------------|-------------|-------------------------------|
| <b>Head's Average Hourly Wage<sup>a</sup></b>                                             | 9.93        | 6.52                          |
| <b>Head's Annual Hours of Labor Supply<sup>b</sup></b>                                    | 2194.63     | 542.12                        |
| <b>Annual Hours of Labor Supply if Annual Hours of<br/>Unemployment Equals Zero</b>       | 2,265.90    | 507.95                        |
| <b>Annual Hours of Labor Supply if Annual Hours of<br/>Unemployment Greater than Zero</b> | 1,784.72    | 550.50                        |
| <b>Annual Hours of Unemployment if Hours of Unemployment<br/>Greater Than Zero</b>        | 393.30      | 347.72                        |
| <b>Annual Food Expenditures<sup>c</sup></b>                                               | 3895.36     | 1790.77                       |
| <b>Current Two-Digit Industry Unemployment Rate<sup>d</sup></b>                           | 6.69        | 3.12                          |
| <b>Current One-Digit Occupation Unemployment Rate<sup>e</sup></b>                         | 6.45        | 3.46                          |
| <b>Observations</b>                                                                       | 29,741      |                               |
| <b>Individuals</b>                                                                        | 5,125       |                               |
| <b>Observations per Individual</b>                                                        | 5.80        |                               |
| <b>Observations With Positive Unemployment Hours</b>                                      | 4,405       |                               |
| <b>Individuals With Positive Unemployment Hours</b>                                       | 1,917       |                               |
| <b>Observations per Individual With Positive Unemployment Hours</b>                       | 2.30        |                               |

*See Notes Table A.3 Part (A)*

**Table B.1**  
**Information Collected by Interview in the CES**

| <b>Type of Information</b>    | <b>Interview 2</b> | <b>Interview 3</b> | <b>Interview 4</b> | <b>Interview 5</b> |
|-------------------------------|--------------------|--------------------|--------------------|--------------------|
| <b>Expenditures</b>           | Yes                | Yes                | Yes                | Yes                |
| <b>Demographics</b>           | Yes                | Yes                | Yes                | Yes                |
| <b>Labor Income and Hours</b> | Yes                | No                 | No                 | Yes                |

**Table B.2**  
**Breakdown of Monthly Data by Quarterly Expenditure Variable in the CES**

| <b>Month of Interview</b> | <b>Months Questioned About</b> | <b>Current Quarter Expenditure Variable</b> | <b>Previous Quarter Expenditure Variable</b> |
|---------------------------|--------------------------------|---------------------------------------------|----------------------------------------------|
| <b>January</b>            | October to December            | 0                                           | October-December                             |
| <b>February</b>           | November to January            | January                                     | November-December                            |
| <b>March</b>              | December to February           | January-February                            | December                                     |
| <b>April</b>              | January to March               | 0                                           | January-March                                |
| <b>May</b>                | February to April              | April                                       | February-March                               |
| <b>June</b>               | March to May                   | April-May                                   | March                                        |
| <b>July</b>               | April to June                  | 0                                           | April-June                                   |
| <b>August</b>             | May to July                    | July                                        | May-June                                     |
| <b>September</b>          | June to August                 | July-August                                 | June                                         |
| <b>October</b>            | July to September              | 0                                           | July-September                               |
| <b>November</b>           | August to October              | October                                     | August-September                             |
| <b>December</b>           | September to November          | October-November                            | September                                    |

**Table B.3**  
**Expenditure Categories: Consumer Expenditure Survey and Universal Classification Code**  
**in the CES**

| <b>Expenditure Category and CES Expenditure Variables</b>                                                                                                                                                       | <b>UCC Number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Food: (FOODPQ &amp; FOODCQ)</b>                                                                                                                                                                              | 190901, 190902, 190903, 190904, 790220, 790230, 790410, 790430                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Nondurable and Services: (ALCBEVPQ &amp; ALCBEVCQ) + (TOBACCPQ &amp; TOBACCCQ)+(GASMOPQ &amp; GASMOCQ)+(UTILPQ &amp; UTILCQ)+(APPARPQ &amp; APPARCQ)+(TRNTRPPQ &amp; TRNTRPCQ)+(PERSCAPQ &amp; PERSCACQ)</b> | 200900, 630110, 630210, 790310, 790320, 790420, 800700, 470111, 470112, 470113, 470211, 470212, 250111, 250112, 250113, 250114, 250211, 250212, 250213, 250214, 250221, 250222, 250223, 250224, 250901, 250902, 250903, 250904, 260111, 260112, 260113, 260114, 260211, 260212, 260213, 260214, 270101, 270102, 270211, 270212, 270213, 270214, 270411, 270412, 270413, 270414, 270901, 270902, 270903, 270904, 360110, 360120, 360210, 360311, 360312, 360320, 360330, 360340, 360350, 360410, 360511, 360512, 360901, 360902, 370110, 370120, 370130, 370211, 370212, 370213, 370220, 370311, 370312, 370313, 370901, 370902, 370903, 370904, 380110, 380210, 380311, 380312, 380313, 380331, 380332, 380340, 380410, 380420, 380430, 380510, 380901, 380902, 380903, 390110, 390120, 390210, 390221, 390222, 390230, 390310, 390321, 390322, 390901, 390902, 400110, 400210, 400220, 400310, 410110, 410120, 410130, 410140, 410901, 440110, 440130, 440900, 420110, 420120, 430110, 430120, 440120, 440140, 440150, 440210, 530110, 530210, 530312, 530411, 530510, 530901, 620909, 340211, 340212, 340310, 340410, 340420, 340520, 340530, 340903, 340906, 340910, 340914, 440120, 440140, 670310, 330511, 340510, 340620, 340630, 340901, 340907, 340908, 690113, 690114, 990900, 640130, 640420, 650110, 650210, 650900. |

**Table B.4**  
**Price Deflators**

| <b>Commodity Category</b> | <b>BLS Series Number</b> |
|---------------------------|--------------------------|
| <b>All Items</b>          | CUUR0000SA0              |
| <b>Nondurable Items</b>   | CUSR0000SAN              |
| <b>Services</b>           | CUUR0000SAS              |

**Table B.5**  
**Occupational Unemployment Rates for the CES**

| <b>Occupation Category</b>                          | <b>BLS Series Number</b> | <b>CES Code</b> |
|-----------------------------------------------------|--------------------------|-----------------|
| <b>Managerial/ Professional</b>                     | LFU2102500000            | 1               |
| <b>Technical Sales &amp; Administrative Support</b> | LFU2102520000            | 2               |
| <b>Services</b>                                     | LFU2102550000            | 3               |
| <b>Precision Production, Craft and Repair</b>       | LFU2102560000            | 5               |
| <b>Farm, Forestry and Fishery</b>                   | LFU2102590000            | 4               |
| <b>Operators, Fabricators and Repair</b>            | LFU2102570000            | 6               |

**Table B.6**  
**Industry Unemployment Rates for the CES**

| <b>Industry Category</b>                                          | <b>BLS Series Number</b> | <b>CES Code</b> |
|-------------------------------------------------------------------|--------------------------|-----------------|
| <b>Construction</b>                                               | LFU2101060000            | 2               |
| <b>Manufacturing</b>                                              | LFU2101100000            | 3               |
| <b>Transportation, Communication &amp; Other Public Utilities</b> | LFU2101200000            | 4               |
| <b>Trade</b>                                                      | LFU2101300000            | 5               |
| <b>Finance, Insurance &amp; Real Estate</b>                       | LFU2101410000            | 6               |
| <b>Professional &amp; Related Services</b>                        | LFU2101460000            | 7               |
| <b>Public Administration</b>                                      | LFU2101426000            | 9               |
| <b>Miscellaneous Services</b>                                     | LFU2101426000            | 8               |
| <b>Agriculture</b>                                                | LFU2101020000            | 1               |
| <b>Forestry &amp; Fisheries</b>                                   | LFU2101030000            | 1               |

**Table B.7**  
**Consumer Expenditure Survey Sample Size Information**

| <b>Year</b>  | <b>(1)</b>     | <b>(2)</b>    | <b>(3)</b>    | <b>(4)</b>    | <b>(5)</b>    | <b>(6)</b> |
|--------------|----------------|---------------|---------------|---------------|---------------|------------|
| <b>1984</b>  | <b>1</b>       | 5,171         | 0             | 0             | 0             | 0          |
|              | <b>2</b>       | 5,120         | 0             | 0             | 0             | 0          |
|              | <b>3</b>       | 5,085         | 0             | 0             | 0             | 0          |
|              | <b>4</b>       | 5,224         | 1,285         | 597           | 365           | 359        |
| <b>1985</b>  | <b>1</b>       | 5,236         | 1,296         | 600           | 364           | 354        |
|              | <b>2</b>       | 5,181         | 1,281         | 557           | 379           | 370        |
|              | <b>3</b>       | 5,069         | 1,244         | 523           | 346           | 342        |
|              | <b>4</b>       | 5,319         | 1,330         | 589           | 355           | 351        |
| <b>1986</b>  | <b>1*</b>      | 5,262         | 1,291         | 616           | 401           | 390        |
|              | <b>1**</b>     | 4,007         | 0             | 0             | 0             | 0          |
|              | <b>2</b>       | 5,814         | 0             | 0             | 0             | 0          |
|              | <b>3</b>       | 5,774         | 0             | 0             | 0             | 0          |
|              | <b>4</b>       | 5,869         | 1,428         | 630           | 251           | 241        |
| <b>1987</b>  | <b>1</b>       | 5,905         | 1,465         | 669           | 417           | 411        |
|              | <b>2</b>       | 5,874         | 1,490         | 650           | 404           | 399        |
|              | <b>3</b>       | 5,766         | 1,417         | 582           | 397           | 391        |
|              | <b>4</b>       | 5,998         | 1,522         | 671           | 428           | 418        |
| <b>1988</b>  | <b>1</b>       | 5,286         | 1,285         | 578           | 366           | 359        |
|              | <b>2</b>       | 4,993         | 1,224         | 538           | 351           | 342        |
|              | <b>3</b>       | 5,039         | 1,211         | 533           | 354           | 346        |
|              | <b>4</b>       | 5,189         | 1,295         | 587           | 387           | 375        |
| <b>1989</b>  | <b>1</b>       | 5,153         | 1,270         | 529           | 348           | 341        |
|              | <b>2</b>       | 5,075         | 1,302         | 588           | 381           | 371        |
|              | <b>3</b>       | 5,007         | 1,220         | 558           | 376           | 367        |
|              | <b>4</b>       | 5,103         | 1,239         | 590           | 381           | 371        |
| <b>1990</b>  | <b>1</b>       | 5,138         | 1,255         | 564           | 372           | 366        |
|              | <b>2</b>       | 5,168         | 1,313         | 593           | 375           | 361        |
|              | <b>3</b>       | 5,044         | 1,236         | 573           | 381           | 373        |
|              | <b>4</b>       | 5,167         | 1,318         | 603           | 391           | 385        |
| <b>1991</b>  | <b>1</b>       | 5,187         | 1,298         | 548           | 371           | 363        |
|              | <b>2</b>       | 5,090         | 1,272         | 544           | 371           | 367        |
|              | <b>3</b>       | 5,065         | 1,205         | 515           | 349           | 345        |
|              | <b>4</b>       | 5,180         | 1,324         | 606           | 416           | 412        |
| <b>1992</b>  | <b>1</b>       | 5,157         | 1,259         | 544           | 375           | 364        |
|              | <b>2</b>       | 5,165         | 1,309         | 562           | 384           | 379        |
|              | <b>3</b>       | 5,164         | 1,228         | 520           | 355           | 346        |
|              | <b>4</b>       | 5,222         | 1,337         | 561           | 341           | 331        |
| <b>Total</b> | <b>194,266</b> | <b>39,132</b> | <b>17,918</b> | <b>11,532</b> | <b>11,290</b> |            |

**Notes:** \* Indicates the final quarter with old identification number.

\*\* Indicates the first quarter with new identification number.

- (1): *Quarter.*
- (2): *Total Number of Observations in Family File.*
- (3): *Total Number of Observations with either a male reference person or spouse on the fifth interview in that quarter.*
- (4): *Number of male observations with valid interview five labor supply information (positive hours, wage and industry-occupation information).*
- (5): *Number of male observations with complete consumption information, between the ages of 23 and 60 at interview two, and industry and occupation information that is valid for interview two.*
- (6): *Number of male observations whose real wage is greater than or equal to \$1 and family real food and beverage expenditures are greater than \$500 and less than \$10,000.*

**Table B.8**  
**CES Descriptive Statistics for Table 3**

| <b>Variable</b>                                                                | <b>Mean</b> | <b>Standard<br/>Deviation</b> |
|--------------------------------------------------------------------------------|-------------|-------------------------------|
| <b>Average Hourly Wage</b>                                                     | 15.05       | 22.19                         |
| <b>Annual Hours of Labor Supply</b>                                            | 2195.45     | 602.42                        |
| <b>Annual Food Expenditures</b>                                                | 4838.51     | 2172.54                       |
| <b>Annual Nondurable and Services<br/>Expenditure Net of Food Expenditures</b> | 6859.27     | 3429.50                       |
| <b>Current Industry Unemployment Rate</b>                                      | 5.41        | 2.95                          |
| <b>Current Occupation Unemployment Rate</b>                                    | 5.56        | 2.20                          |
| <b>Observations</b>                                                            | 11,290      |                               |