Readme

Sharing rule identification for general collective consumption models

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The *Econometrica* package consists of two folders: **Data** and **Programs**. All data files are included in the folder **Data**. All programs (Stata file to construct the final data, as well as all MATLAB programs for the demand and sharing rule estimation) are contained in the folder **Programs**.

1 Data

1.1 Introduction

The data used in this study are drawn from the **Panel Study of Income Dynamics (PSID)**, which is produced and distributed by the Survey Research Center, Institute for Social Research, University of Michigan. See the website **http://psidonline.isr.umich.edu/** for details. The public release data can be downloaded directly from the PSID website. We used the 1999-2009 waves in our study.

1.2 Final data

The Stata do-file to construct the data can be found in the folder **Programs/Data-Construction** of the *Econometrica* replication package. The Stata do-file used to construct the final data is named **ECMA_L4_Data.do**. The do-file starts from the Stata-files **CompleteData1999.dta-CompleteData2009.dta**, which contain the public release data from the PSID. It also makes use of the files **Data.dta** (which contains food expenses that were later added to the analysis at some point) and **CPIDef.dta** (which contains CPI prices downloaded from the website www.economagic.com, an economics time series source). The do-file results in two final datasets: **PSIDWave19992009NoChildren.txt** and **PSIDWave19992009Children.txt**. The former contains 865 childless couples while the latter contains 1390 couples with children.

The final datasets contain the following variables: (1) Interview number in 1999 (which can be used as a household identifier); (2) Year; (3) Age of the husband; (4) Age of the wife; (5) Number of children; (6) Region; (7) Education of the husband; (8) Education of the wife;

(9) Full income; (10) Hours of leisure husband; (11) Hours of leisure wife; (12) Wage rate husband; (13) Wage rate wife; (14) Quantity food; (15) Quantity housing; (16) Quantity other goods; (17) Price food; (18) Price housing; (19) Price other goods; (20) Dummy for homeowner.

2 Programs

2.1 Demand estimation

In the paper, sharing rule bounds are estimated for four different demand systems (denoted by RP1 to RP4 in the paper): (i) a fully nonparametric demand system (RP1); (ii) the Quadratic Almost Ideal Demand System (RP2); (iii) the Quadratic Almost Ideal Demand System with the SR1-restriction imposed (RP3); and the (iv) Quadratic Almost Ideal Demand System (RP4) with the age of the husband and a dummy for homeownership as taste shifters. Shares are estimated for the samples **PSIDWave19992009NoChildren.txt** and **PSIDWave19992009Children.txt**. The MATLAB code for the fully nonparametric demand system is directly integrated in the corresponding sharing rule estimation program and will be discussed in the next subsection. Another route is followed for the parametric demand systems. In this case parameter estimates were obtained via separate programs. These estimates are then used in the sharing rule estimation step.

Parameter estimates for the three different parametric demand systems and the two samples are obtained by the respective MATLAB programs (1) **QUAIDS_NOSR1_estimation_Ecma2_NoChildren.m**, (2) **QUAIDS_NOSR1_estimation_Ecma2_Children.m**, (3) **QUAIDS_SR1_estimation_Ecma2_NoChildren.m**, (4) **QUAIDS_SR1_estimation_Ecma2_Children.m**, (5) **QUAIDS_SR1_estimation_Ecma2_TasteShifters2_NoChildren.m** and (6) **QUAIDS_SR1_estimation_Ecma2_TasteShifters2_Children.m**. Starting values for the QUAIDS estimations were obtained through the estimation of a linearized QUAIDS version, with a Stone price index. The MATLAB programs associated with this step are (1) **QUAIDS_Stone_estimation_Ecma2_NoChildren.m**, (2) **QUAIDS_Stone_estimation_Ecma2_Children.m**, (3) **QUAIDS_Stone_estimation_Ecma2_TasteShifters2_NoChildren.m**, and (4) **QUAIDS_Stone_estimation_Ecma2_TasteShifters2_Children.m**. (Note that the unrestricted QUAIDS and the SR1-restricted QUAIDS make use of the same starting values). All these programs can be found in the folder **Programs/DemandEstimation** of the *Econometrica* package.

2.2 Sharing rule estimation

All sharing rule estimation programs can be found in the folder **Programs/Sharingrule** of the *Econometrica* package. There is a separate subfolder for each demand estimation (RP1, RP2, RP3 and RP4) and data (couples without and with children) combination. Note that all the sharing rule estimation programs make use of the external solver TOMLAB, which is called in the MATLAB programs. In principle, the programs can be adapted such that they only need MATLAB. Note though that estimates may be different across different solvers given different default values, algorithms, etc. RP1 bounds for childless

couples and couples with children can be calculated by means of **Sharingrule/kernel_-(no)children/Bounds_PSID_kernel.m**. This program makes use of a nonparametric kernel based demand estimation function to obtain a predicted demand bundle for given prices and a given full income. RP2 bounds can be calculated by means of **Sharingrule/quaids_-NO_SR1_(no)children/Bounds_PSID_quaids_no_sr1.m**, RP3 bounds by means of **Sharingrule/quaids_SR1_(no)children/Bounds_PSID_quaids.m** and RP4 bounds by means of **Sharingrule/quaids_SR1_TasteShifters_(no)children/Bounds_PSID_-quaids.m**. The latter programs make use of the earlier estimated QUAIDS parameters to obtain predicted demand for given prices and a given full income.