Replication files for

Breaking the Implicit Contract: Using Pension Freezes to Study Lifetime Labor Supply

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The programs in this replication archive rely on public as well as restricted-access data. Publicly available Health and Retirement Study (HRS) data are used in match_function.do and HRS_rrates_full.do. These input files (including the RAND-HRS files) can be downloaded freely after registering on the HRS' website. Restricted-access HRS data (pension estimation program and associated files) are used as inputs to run the programs in the **hrs-micda-code** directory. These data can be accessed after obtaining a data-use agreement from the HRS. See https://hrs.isr.umich.edu/data-products/restricted-data/vdi for further instructions. Restricted access Census Bureau data are used as inputs to run the programs in the **fsrdc-code** directory. These data can be accessed through the FSRDC network after obtaining Special Sworn Status and associated data-use approvals from the Census Bureau. See: https://www.census.gov/topics/research/guidance/restricted-use-microdata/standard-application-process.html for further instructions.

Program files in this archive are divided into three directories. Within each directory, run programs in the order they are shown below. Stata programs were originally run in Stata version 17. Matlab programs were originally run in version R2019a.

1) **fsrdc-code:** This folder contains programs that are run on restricted-access Census data.
    - 00_compute_cpi.do <imports CPI data>
    - 01_prep5500.sas <cleans Form 5500 data>
    - 02_5500BRB.sas <links cleaned Form 5500 data to Census Business Register>
    - 03_create_firmpanel.do <creates firm-level panel data of DB pension-sponsors using LBD>
    - 04_toLEHD.sas <links DB pension sponsoring firms to LEHD; creates worker-level dataset>
    - 05_agestrucall.sas <constructs variables on age composition of each firms' workforce>
    - 06_create_workerpanel.do <aggregates individual data into bins for estimating regression models>
    - 07a_workerlevel_analysis.do <runs main analyses to produce summary statistics tables (Table 1 and F1-F4) and regression model estimates (Figures 2-5 and F2-F9); computes retirement rates by age bin to compare with HRS in Fig C1>
    - 07b_workerlevel_analysis_10ygroup.do <runs regression models on subset of observations where 10 years of post-event data are available (robustness checks)>
    - 08_retage_distribution.do <computes share of retirement in different age bins for treated and control workers>
    - 09_multiplanlossstat.sas and 09b_restrplan_cnt.do <computes share of observations lost by imposing one plan per firm per year restriction; used in Table B1>

- 10_f55brmatchrate.do <computes tables on match rate between Form 5500 data data on plans and Business Register data on firms; used in Table B1>
- The remaining SAS programs are called as inputs in the main programs.

2) **hrs-micda-code:** This folder contains programs that are run on restricted-access HRS data.
   - earnings_curvature.do <estimates parameters of life-cycle earnings profiles that are input into HRS' restricted-access pension estimation program (PEP)>
   - SSAmortality_probabilities.do <constructs table of mortality rates by age and sex>
   - annuity_factors.do <computes annuitization factors using mortality rates>
   - analyze_10penval.do <analyze outputs generated from HRS' PEP>
   - sswealth.do <constructs table of average Social Security wealth by age>
   - oth_wealth.do <moments of non-pension and DC wealth distributions by age>
   - wealthdistparams.m <estimates parameters of joint wealth distributions by age>
3) **structural-model-code:** This folder contains programs to estimate the structural model and run counterfactual analyses. Some matlab programs in the directory are function files. These files are not described below.
   - match_function.do <estimates DC match function using HRS survey data>
   - nber_taxsim_prep.m <creates simulated income grid points on which tax liabilities can be computed>
   - nber_taxsim.do <computes simulated tax liabilities for each income grid point>
   - sim_annfactors.m <computes annuitization factors>
   - start_value_search_eis515_10wt.m <searches for parameter starting values>
   - master_estimate.m <master program that estimates the structural model; produces Panel A of Table 2.>

     The following programs produce the results shown in Panel B of Table 2:

   - smom_tempshock58.m <simulates the effect of a 20% increase in wages at age 58>
   - analyze_simulated_data_frisch58.do <Estimates labor supply elasticity at age 58>
   - smom_tempshock60.m <simulates the effect of a 20% increase in wages at age 60>
   - analyze_simulated_data_frisch60.do <Estimates labor supply elasticity at age 60>
   - smom_tempshock62.m <simulates the effect of a 20% increase in wages at age 62>
   - analyze_simulated_data_frisch62.do <Estimates labor supply elasticity at age 62>
   - smom_tempshock64.m <simulates the effect of a 20% increase in wages at age 64>
   - analyze_simulated_data_frisch64.do <Estimates labor supply elasticity at age 64>

     The following programs produce the results shown in Table E2 and Figure E1:
   - start_value_search_eis15.m <searches for starting values restricting EIS to 1.5>
   - master_estimate_eis15.m <estimates structural model restricting EIS to 1.5>
   - start_value_search_eis075.m <searches for starting values restricting EIS to 0.75>
   - master_estimate_eis075.m <estimates structural model restricting EIS to 0.75>

     The following programs produce the results shown in Table 3:
   - smom_function_z58_avg.m <solves model with avg DC plan / freeze age = 58>

- analyze_z58_avg_simulated_data.do <construct counterfactual estimates with avg DC plan/freeze age=58>
- smom_function_z60_avg.m <solves model with avg DC plan / freeze age = 60>
- analyze_z60_avg_simulated_data.do <construct counterfactual estimates with avg DC plan/freeze age=60>
- smom_function_z62_avg.m <solves model with avg DC plan / freeze age = 62>
- analyze_z62_avg_simulated_data.do <construct counterfactual estimates with avg DC plan/freeze age=62>
- smom_function_z58_tsp.m <solves model with TSP / freeze age = 58>
- analyze_z58_tsp_simulated_data.do <construct counterfactual estimates TSP/freeze age=58>
- smom_function_z60_tsp.m <solves model with TSP / freeze age = 60>
- analyze_z60_tsp_simulated_data.do <construct counterfactual estimates with TSP/freeze age=60>
- smom_function_z62_tsp.m <solves model with TSP / freeze age = 62>
- analyze_z62_tsp_simulated_data.do <construct counterfactual estimates with TSP/freeze age=62>
- The remaining programs in the directory are function files, which are called within the programs described above.

4) **supplementary-code:** this folder contains supplementary files
   - f5500_raw.do <cleans/organizes raw Form 5500 data>
   - HRS_rrates_full.do <Computes HRS-based retirement rate by age; used in Fig C1>
   - graphs-all.do <produces all Figures; calls prep_excel_sheet.do>

Data

1) **data/**: This folder contains various input data sets as well as intermediate files. Two xlsx files (2021-pension-data-tables.xlsx and private-pension-plan-bulletin-historical-tables-and-graphs.xlsx) have not been uploaded because the replication archive cannot support xlsx extensions. Please contact the author for these files.
2) **data/HRS MiCDA/Tables**: This folder contains output released from the HRS MiCDA enclave. These files are used in various programs in the structural-model-code folder.
3) **data/FSRDC/Tables**: This folder contains output released by the U.S. Census Bureau. These files are used to construct tables in the paper or as inputs in various programs in the structural model-code-folder. The Census Bureau has ensured appropriate access and use of confidential data and has reviewed these results for disclosure avoidance protection (Project 6000576: CBDRB-FY19-8002, CBDRB-FY19-8279, CBDRB-FY24-CED006-0017).
4) **data/model-output**: This folder contains output from structural model estimation steps.
5) **data/F5500**: This folder contains raw Form 5500 data. Raw data are too large for upload to the replication archive. Please contact the author for these files. These data are also available at https://www.dol.gov/agencies/ebsa/about-ebsa/our-activities/public-disclosure/foia/form-5500-datasets.