Supplement to "Long-term government debt and household portfolio composition"

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APPENDIX G: ADDITIONAL DESCRIPTIVE STATISTICS AND FIGURES

TABLE B.1. Portfolio characteristics in first and last survey wave.

Variable	1989	2007
Participation rates		
Stock market	0.68	0.78
Long-term gov. debt market	0.71	0.75
Conditional portfolio shares		
Stock share	0.32	0.44
Long-term gov. debt share	0.15	0.14

Note: Shown are sample means. Portfolio shares are conditional on participation in respective market.

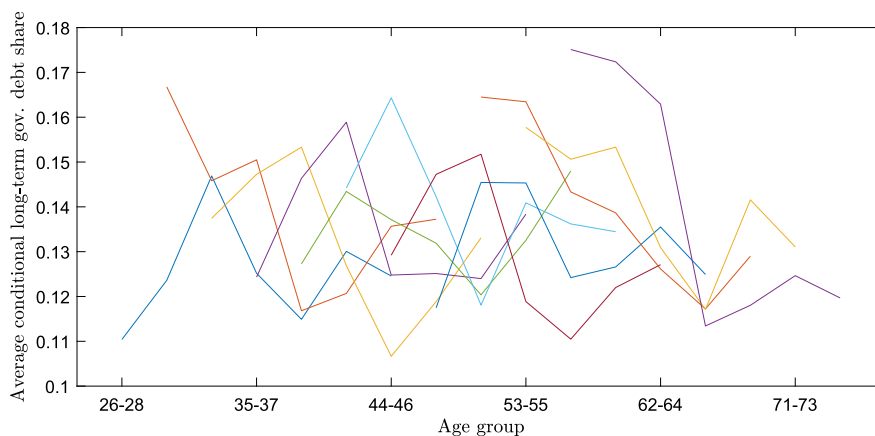

FIGURE B.1. Long-term government debt share conditional on stock or debt market participation.
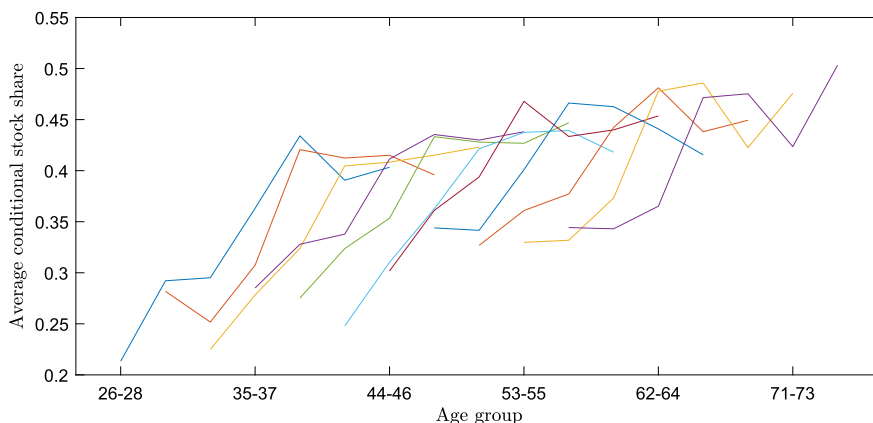
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FIGURE B.2. Stock share conditional on stock or debt market participation.

APPENDIX H: PRINCIPAL COMPONENTS OF MACROECONOMIC AGGREGATES

The macroeconomic time series used in the principal component analysis are the 1-year interest rate, the 10-year Treasury rate, the growth rate of the S&P composite stock price index, the dividend growth rate (all from Robert Shiller's online database), the growth rate of the FHFA's all-transactions house price index, the GDP growth rate (BEA), the civilian unemployment rate (BLS), the CPI inflation rate (BLS), and the growth rate of the broad trade-weighted U.S. dollar index (Fed).

In the estimation, $p = 3$ principal components are included. The first three principal components have eigenvalues that are larger than one and, therefore, make an above-average contribution to capturing the volatility of the underlying time series. Jointly they explain more than three quarters of the total variance, as shown in Table B.2.

Table B.3 contains the corresponding eigenvectors. The first component has size-able loadings of roughly equal size on all variables with the exception of the exchange rate. The largest loading is on GDP growth and the only negative loading is on the un-

TABLE B.2. Principal component analysis of macroeconomic aggregates.

Component	Eigenvalue	Fraction Explained (Cumulative)
1	3.96	0.44
2	1.94	0.66
3	1.15	0.78
4	0.97	0.89
5	0.42	0.94
6	0.25	0.97
7	0.20	0.99
8	0.06	0.99
9	0.05	1.00

Table B.3. Principal components (eigenvectors).

Variable	Component 1	Component 2	Component 3
1-year interest rate	0.41	0.34	0.04
10-year Treasury rate	0.38	0.36	0.20
Exchange rate	0.15	0.56	−0.22
Stock prices	0.28	−0.22	0.30
Dividends	0.28	−0.48	0.29
House prices	0.33	−0.22	−0.54
GDP	0.43	−0.27	−0.00
Unemployment	−0.37	0.07	0.49
CPI Inflation	0.29	0.19	0.45

employment rate. It might therefore be interpreted as the position in the business cycle or "overall macroeconomic conditions." The second component significantly loads on asset yields and prices but less on the unemployment rate and CPI inflation. It discriminates between interest rates and prices through positive loadings on interest rates and the exchange rate and negative loadings on stock prices, dividends, and house prices. Correspondingly, one might label it "asset yields." The final component has large loadings with opposite sign on house prices versus the unemployment rate and CPI inflation. One might interpret it as the economic conditions for households.

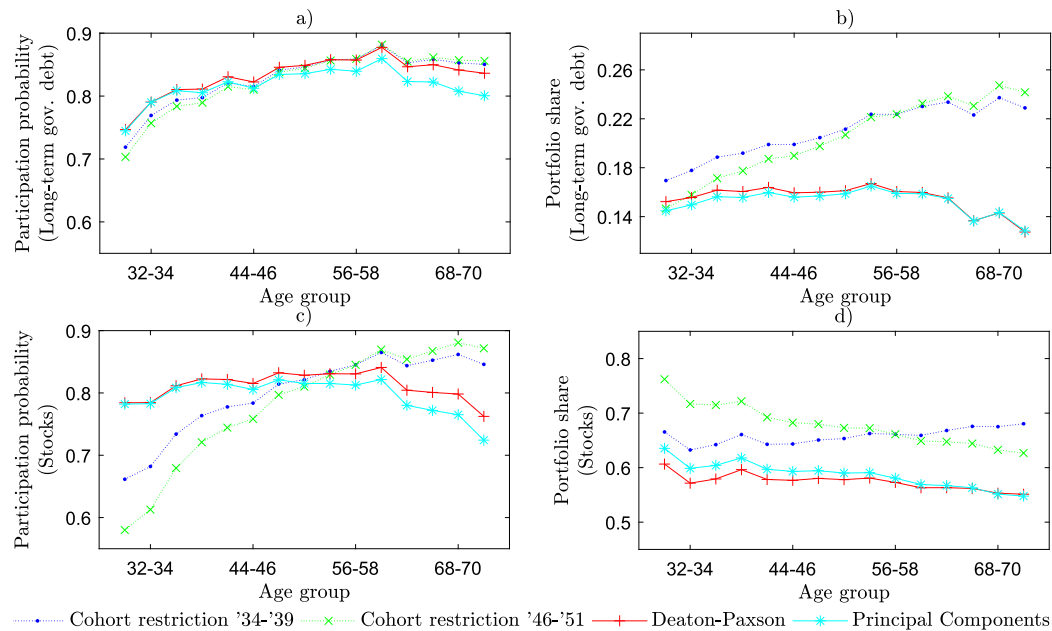## Appendix I: Additional estimation results

Figure B.3. Predicted participation probabilities and conditional asset shares. (Corporate bonds included in long-term debt category.)
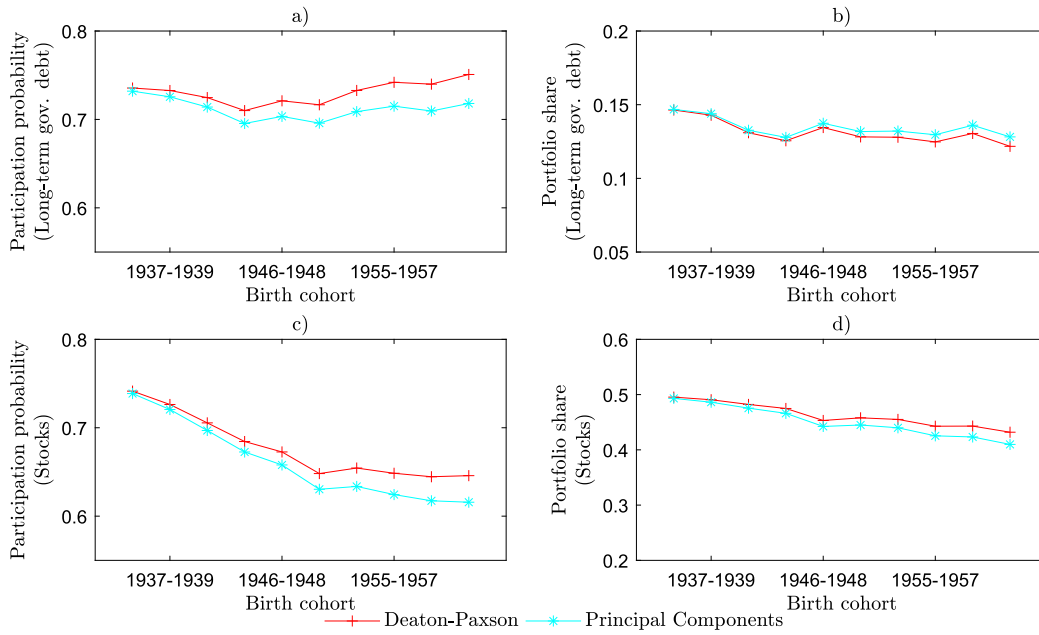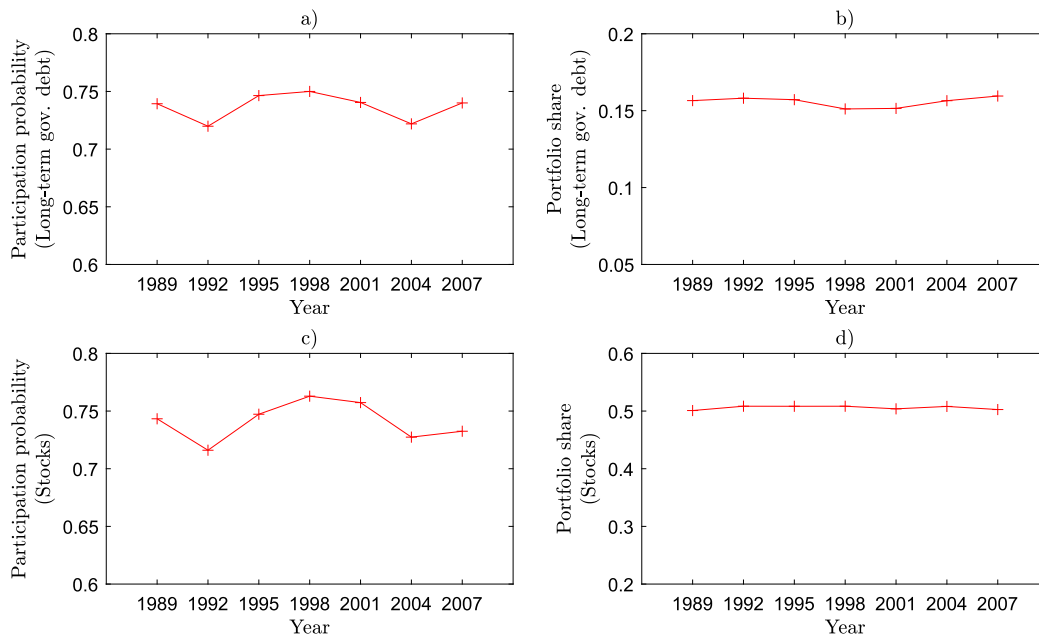
FIGURE B.4. Cohort effects.

FIGURE B.5. Time effects (based on Deaton–Paxson restrictions).
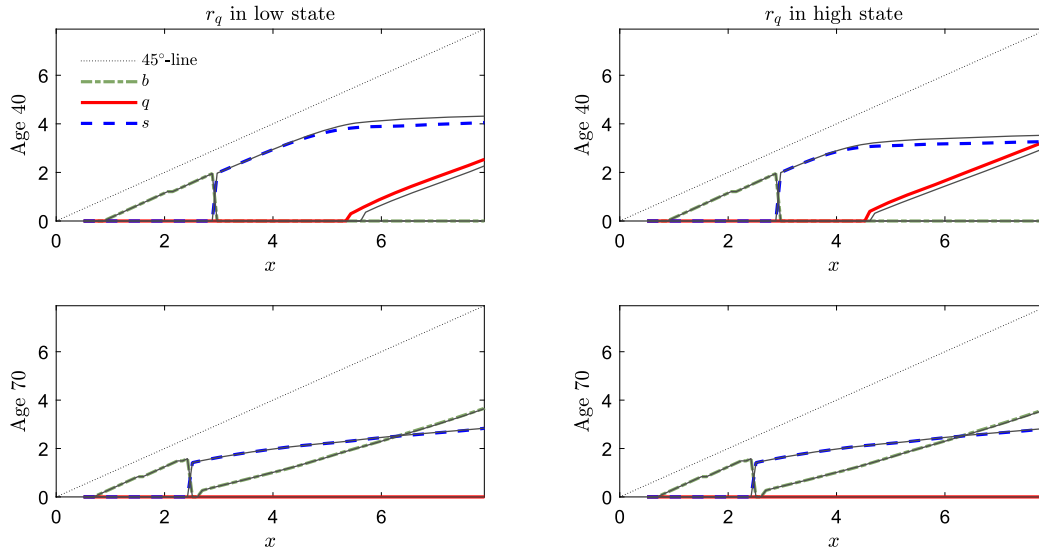
Appendix J: Additional simulations

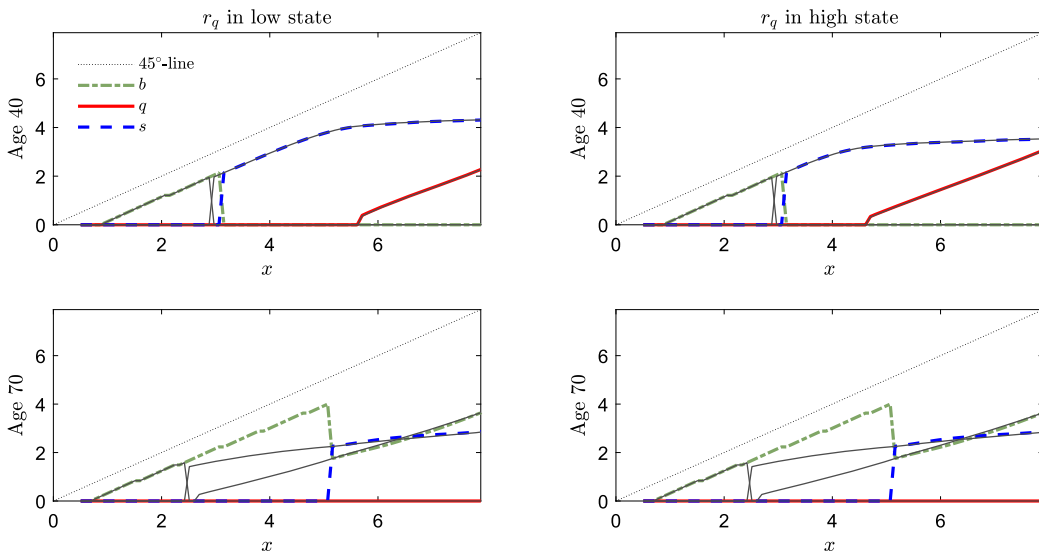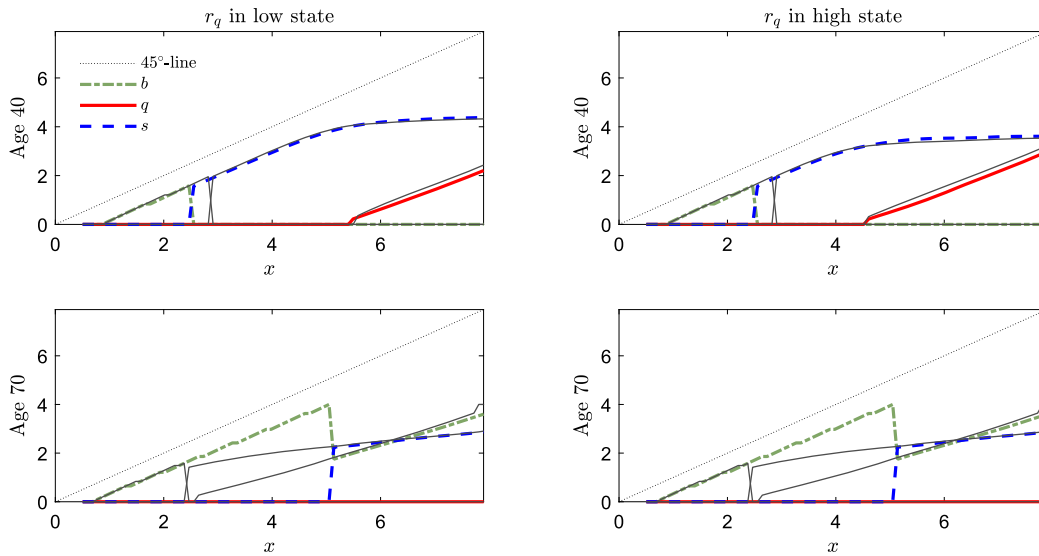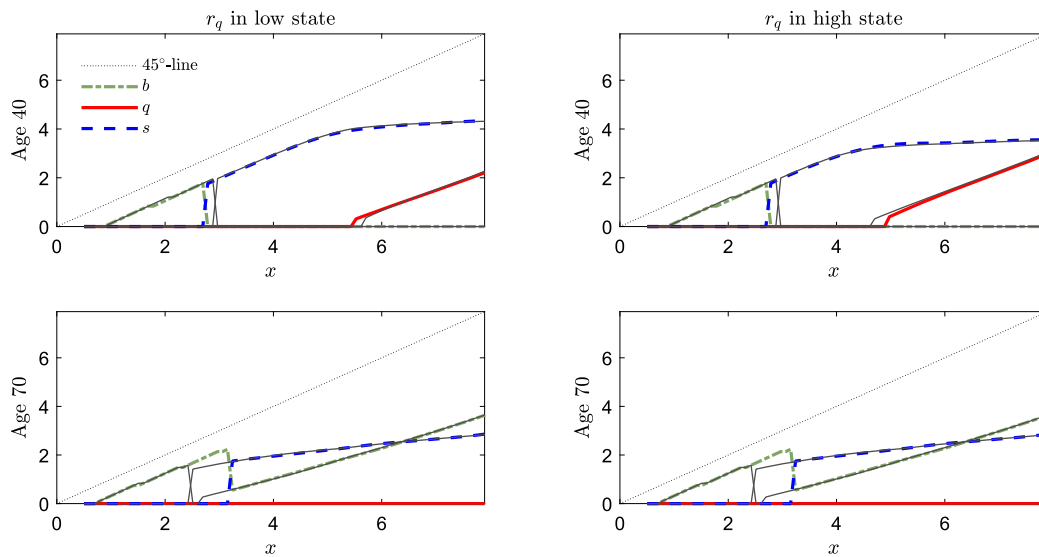Figure B.6. Policy functions for $r_q = 1.027$ (baseline with $r_q = 1.026$ shown in grey).

Figure B.7. Policy functions for $\psi = 0.04$ (baseline with $\psi = 0.035$ shown in grey).

FIGURE B.8. Policy functions for $\delta = 7.5$ (baseline with $\delta = 5$ shown in grey).

FIGURE B.9. Policy functions for $\beta = 0.95$ (baseline with $\beta = 0.96$ shown in grey).
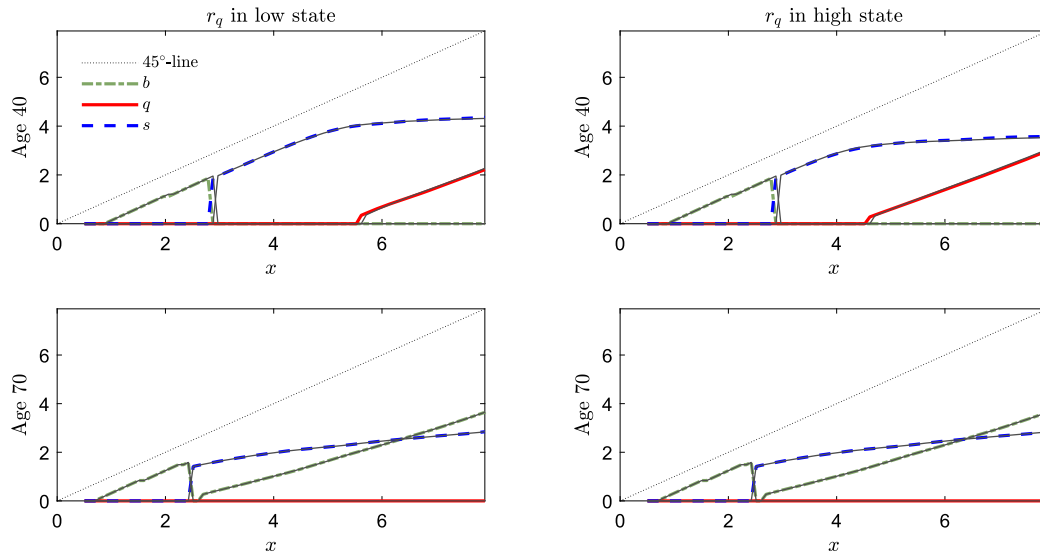
FIGURE B.10. Policy functions for $T_{\text{ret}} = 38$ (baseline with $T_{\text{ret}} = 36$ shown in grey).
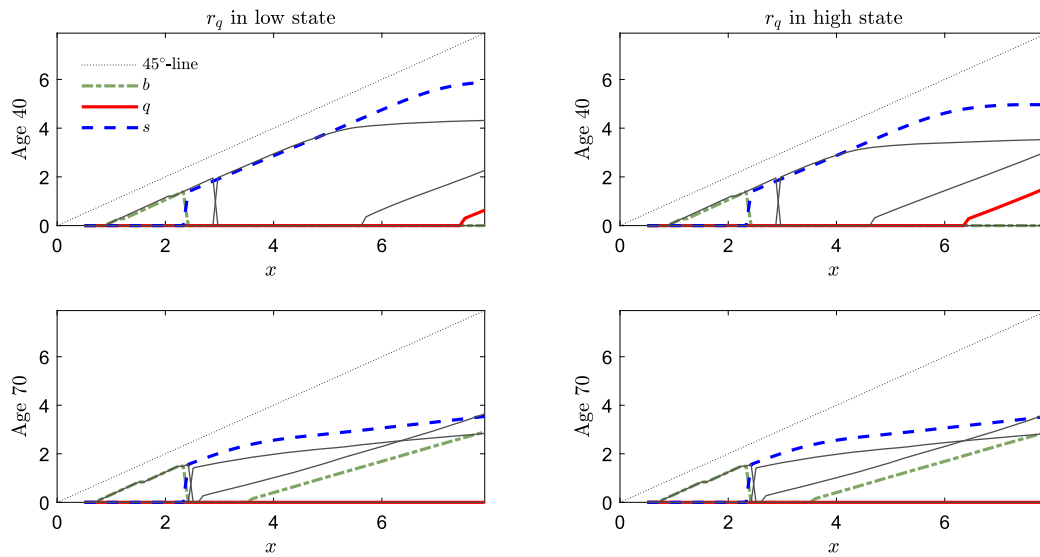

FIGURE B.11. Policy functions for $\gamma = 4$ (baseline with $\gamma = 5$ shown in grey).