

Portfolio Allocation and Retirement Income

Saving and investment decisions throughout investors' lives determine the risk and return investors face as well as the consumption during their working careers and in retirement. The issue of optimal investment portfolio allocation over the life cycle has received a lot of attention from academics and finance professionals. The standard models suggest that young investors should only invest in stocks and then slowly decrease the risky portfolio share as they age. However, these models abstract from many features that are important in life cycle decision making. Among them, models typically ignore that retirement income is determined by lifetime earnings and age at retirement, that workers may adjust their retirement date, and that they face numerous retirement-specific risks. To address this gap, I study how the design of the social security or public pension program affects investors' decisions before and during retirement. I also analyze how retirement income uncertainty and flexibility to adjust the retirement date affects optimal investment decisions?

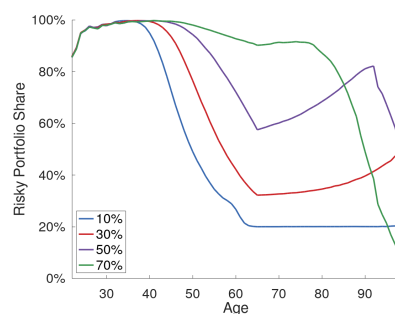
To answer these questions and further bridge the gap between the existing literature and the real world, I build on a standard life cycle investment-consumption model by including a realistic progressive social security program in which (1) investors' income is dependent on her lifetime earnings, (2) agents may adjust their retirement date and claim early-claiming penalty or late-claiming credit, (3) face a risk of forced early retirement, and (4) face retirement income uncertainty.

I find that young agents maintain a high share of risky assets in their portfolios no matter what the design of the retirement income program is. The latter stages of the life cycle very much depend on the design of the re-

tirement income program, flexibility to choose retirement as well as on the shocks agents expect to experience in older age.

First, I find that the risk of moderate retirement income variability as well as retirement income progressivity (dependence on lifetime earnings) do not significantly affect lifetime saving and investing profile. Agents who face uncertain variability in retirement income have virtually the same investment profile before retirement and only slightly higher savings and lower stock market exposure in retirement compared to agents who do not face retirement income uncertainty.

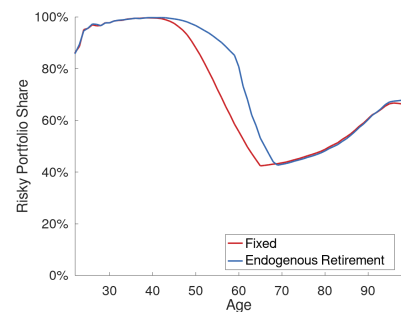
The net replacement rate matters for optimal saving and investing behavior in middle and older age. A high replacement rate in retirement creates a smooth income lifetime profile which induces the agent to save significantly less wealth for retirement and invest considerably riskier all throughout the life cycle as shown in the figure below. The lower the replacement rate in retirement, the more agents save for retirement, and the sooner they start reducing risky portfolio share.



When an investor faces a forced retirement risk, the optimal share invested in stocks starts to decline at an earlier age in anticipation of a possible early retirement and diminished income in retirement.



On the other hand, the flexibility to choose a retirement date makes it optimal for an investor to maintain a very high stock market exposure up until the retirement date. An agent who can adjust her retirement date can stay in the labor force after a negative stock market shock creating a negative correlation between the human capital and stock market returns.



With both the forced retirement risk and flexibility to alter the retirement date, it is optimal to start decreasing the risky portfolio share around age 40. The risky portfolio share temporarily increases once the agent qualifies for retirement.

