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Stock holdings over the life cycle: Who hesitates to join the market?

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ABSTRACT

In this paper, we study the empirical relationship between age and individual wealth held in stocks, focusing on the heterogeneity of risk-taking over the life cycle in the population. We use micro-data and nonparametric quantile regression to argue that there is a pronounced life cycle pattern of risk-taking for households, which is conditional upon ownership. Specifically, we show that the fraction of stock investment decreases to bottom significantly in midlife and increases afterwards, contradicting the popular evidence claiming a hump-shaped pattern. The pressure of large financial obligations during middle age may be the reason for the crowding out of stock market risk-taking and could induce low capital returns for households.

1. Introduction

Households have to plan their financial strategies over a long but finite lifetime horizon during which they are faced with changing constraints and obligations. This "life cycle" gives household finance its own character and makes optimizing people's utility with portfolio choices reasonably

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difficult and worthy of discussion. In fact, the characteristics of individuals' trading behavior have essential implications for building theoretical micro-economic models. Financial planners also consider the issue to be a matter of concern, since individual control over household financial decisions has been strengthening as a result of wealth accumulation and financial market innovation. Moreover, the welfare implications of investment decisions made by households concern policymakers as well as economic practitioners (Calvet et al., 2006).

There is considerable empirical evidence that portfolio decisions of households display a significant life cycle pattern. Guiso et al. (2000) find that risky assets participation shows a hump-shaped pattern over age in the United Kingdom, Italy, Germany, the Netherlands and the United States. Wu et al. (2010) provide evidence that this hump-shaped pattern holds for Chinese households as well. Yoo (1994), Agnew et al. (2003) and Gomes and Michaelides (2005) reach a similar conclusion. While these studies employ probit and tobit regressions to deal with the censored data problem, their focus lies on mean analysis.

There are at least two reasons why we want to look into this topic again. First, as we show in this paper, the phenomenon of nonparticipation in risky investments makes mean regression weak at capturing a comprehensive picture. Since we want to examine what happens to people who actually invest, it is necessary to focus on the right tail of the investment distribution. Second, as shown by previous empirical evidence, a more flexible setting than a linear relationship needs to be considered. Accordingly, our paper adds to the literature by reexamining life cycle patterns of household stock investment using nonparametric quantile regression, which has the following novel features. First, by estimating a family of conditional quantile curves, it reveals a comprehensive picture of how heterogeneous household behaviors develop over age. That is, we try to examine the distinctive ways in which investment changes among individuals at different quantiles of the investment distribution. Second, to address the potential non-linear patterns, we perform quantile regression in a nonparametric setting. We study micro-data drawn from the Survey of Household Finances and Attitudes (SHFA) with detailed information on the portfolio composition of Chinese households. Like the Survey of Consumer Finances (SCF), the data oversamples the wealthy. In order to adjust the sample to the target population, we employ the raking procedure to generate sample weights and estimate both weighted and unweighted samples.

In contrast to the existing literature, our results show a pronounced decline of portfolio shares in stock holdings at midlife. The hump shape only remains in the top quantiles, which refer to investors who tend to invest quite a lot. Combining the facts that investors at the far right end of the distribution take a large amount of risk, the mean regression results mentioned above are not unreasonable. However, they suggest that an important part of the comprehensive picture for stock holdings over the life cycle has so far been overlooked.

It is worth looking a little more closely at the interpretation of the stock-holding decline in middle age. At least two alternative, but not mutually exclusive, stories can be told. The first refers to background risk, for example from labor income. As Heaton and Lucas (2000) and Angerer and Lam (2009) claimed, uninsurable income risk tends to crowd out stock holdings by changing people's tolerance for risk-taking. Since the age profile of labor income reaches a high point in middle age (Cocco, 2005), the presence of labor income risk can provide a rationale for the decline in risky asset investment during that stage. The second story can be told with a targeting explanation. Following Jagannathan and Kocherlakota (1996), people meet large financial obligations such as saving for housing, children's education and retirement when they reach their thirties to forties. It has been documented that people accumulate durables early in life and invest in financial assets later in life (Fernandez-Villaverde and Krueger, 2011). Thus, households are forced out of the stock market although participation may be optimal considering stock returns are generally reported to outperform bonds (see Jagannathan et al., 2000). Our results are more consistent with the latter explanation, since we observe that the people who invest the most don't cut their stock investment during middle age. As we will show later, people who invest more tend to be wealthier, have a higher income, and need to save relatively fewer resources to meet their obligations. A simplified model will be solved to illustrate this interpretation.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes the sample and the raking process, while Section 4 presents the methodology of nonparametric quantile regression. The results are discussed in Section 5. Section 6 concludes.