



Subjective life horizon and portfolio choice[☆]



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ABSTRACT

Using data from a U.S. household survey, we examine the empirical relation between subjective life horizon (i.e., the self-reported expectation of remaining life span) and portfolio choice. We find that equity portfolio shares are higher for investors with longer horizons, controlling for gender-specific age effects, socio-economic characteristics, health, and optimism. Our result is robust to accounting for the endogeneity of equity market participation or instrumenting subjective life horizon with parental survival. Finally, we show that the effect of a shortening horizon on portfolio allocation is stronger for households without bequest motives.

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1. Introduction

Recent research has argued that the optimal risky asset allocation is higher for investors with longer horizons, for two reasons. First, there is evidence that stock returns are mean-reverting, implying that stocks are safer in the long run (Barberis, 2000; Campbell and Viceira, 2002; Bec and Gollier, 2009). Second, if household preferences are characterized by loss aversion, the optimal risk exposure typically increases with the investment horizon (Benartzi and Thaler, 1995; Berkelaar et al., 2004; Bovenberg et al., 2007). The importance of horizon in such theoretical models coincides with popular investment advice (e.g., Malkiel, 2011, p. 364: “the longer the time period over which you can hold on to your investments, the greater should be the share of common stocks in your portfolio”).

Little evidence exists on how horizon affects the behavior of investors in practice. A number of papers have studied how portfolios vary with age on average (e.g., Poterba and Samwick, 2001; Ameriks and Zeldes, 2004; Fagereng et al., 2013), but they do not try to isolate the role of investors' horizons in household financial decision-making. (The motivation for such

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work often lies in life-cycle portfolio models that focus on the variation of human capital over an investor's career.) The goal of our paper is to disentangle horizon effects from portfolio determinants that depend on an individual's age (such as labor income risk), by using self-reported expected remaining life span as a proxy for investment horizon.

Prior literature has highlighted the importance of individuals' subjective assessments of the probabilities of certain outcomes in explaining economic choices (e.g., [Manski, 2004](#)). Subjective probabilities are particularly relevant when concerning parameters such as survival ([Hurd, 2009](#)), where individuals' private information on for example genetic background and health risk behavior (e.g., smoking, unhealthy eating) may be relevant ([Perozek, 2008](#)). Longevity expectations indeed predict mortality, even after controlling for observable demographic and socio-economic characteristics ([Smith et al., 2001](#); [Hurd and McGarry, 2002](#)). While subjective survival probabilities have been related to saving and consumption patterns among the elderly (e.g., [Bloom et al., 2006](#)), no study has investigated their empirical relation with portfolio choice.

The data used in this paper come from the Survey of Consumer Finances, a survey of U.S. households. Each iteration of the survey since 1995 has included the following question: "About how old do you think you will live to be?". We compute a respondent's subjective life horizon as this self-assessed life expectancy minus his or her current age. We find substantial variation in subjective life horizons. For example, for 50-year old males, the central 90 percentile range of the distribution of life horizons goes from 14 to 50 years. More generally, one-third of the variation in horizons cannot be explained by differences in age, gender, race, and survey year between respondents. We find positive conditional correlations of subjective life horizon with a self-reported planning horizon measure, with retirement intentions, and with (pension) savings behavior. These initial results validate our measure, and suggest that households indeed take into account their expected life horizon when making economic decisions. Moreover, we find that self-reported risk tolerance increases with horizon, consistent with the theoretical arguments put forward by previous papers.

Our main empirical tests examine the relation between subjective life horizon and equity holdings. Throughout our analysis, we control for a range of socio-economic and demographic characteristics, including gender-specific age effects, which should mitigate concerns that our results are driven by variation in labor income risk or in other age-dependent portfolio determinants over the life cycle. Crucially, we also control for variation in health status and optimism, both of which are correlated with horizon but may also have direct effects on the portfolio allocation ([Rosen and Wu, 2004](#); [Puri and Robinson, 2007](#)). Our regression results consistently show that, conditional on stock market participation, the share of financial assets allocated to equities is positively related to subjective life horizon. In economic terms, the effects are relatively small but not negligible. In our baseline setting, a horizon that is one year longer is associated with an equity share that is 0.07 percentage points higher. Over the range of horizons among 50-year old male household heads considered before (between the 5th and the 95th percentile), variation in subjective life horizon can thus explain differences in equity shares of about 2.5 percentage points, which amounts to slightly more than 5% of the unconditional sample mean.

We then perform a number of tests on the robustness of our main finding that subjective life horizons and equity shares are positively correlated. First, we present evidence that horizon also affects equity investments on the extensive margin: equity market participation is positively related to subjective life horizon. (By contrast, we do not find an effect on direct stock holdings, which should further reduce worries that we are picking up the effects of optimism rather than variation in horizon.) Second, we account for the endogeneity of the equity market participation decision by applying a Heckman selection model. The effect of subjective life horizon on equity shares remains unchanged. Third, we use data from the Health and Retirement Study to construct an alternative subjective life horizon measure that is moreover instrumented with the current age or age at death of the respondent's parents. This strategy is motivated by evidence that individuals rely on the longevity of relatives when forming subjective survival expectations ([Hamermesh, 1985](#); [Hurd and McGarry, 1995, 2002](#); [Smith et al., 2001](#)), and mitigates concerns about measurement error, focal points, and reverse causality ([Bloom et al., 2006](#)). As before, we find a statistically significant positive effect of horizon on equity shares.

In the final part of our empirical analysis, we examine how horizon effects interact with bequest motives. In line with the hypothesis that households with bequest motives behave as if their investment horizon is infinite ([Barro, 1974](#); [Jappelli, 1999](#)), we find evidence that the presence of children attenuates the impact of a shortening horizon on equity shares. For childless households, a horizon that is shorter by one year is associated with an equity share that is 0.20 percentage points lower, while the effect only equals 0.05 percentage points for households with children. The impact of horizon on the risky asset share is thus much stronger for households without bequest motives.

This paper relates to different strands of the literature. First, a number of papers have argued that optimal risk-taking behavior is affected by the investment horizon, thereby going against the constant-portfolio result of [Mossin \(1968\)](#), [Merton \(1969\)](#), and [Samuelson \(1969\)](#). Risky assets may become less attractive over shorter time horizons because of mean reversion in returns ([Barberis, 2000](#); [Campbell and Viceira, 2002](#); [Bec and Gollier, 2009](#)) or investor loss aversion ([Benartzi and Thaler, 1995](#); [Berkelaar et al., 2004](#); [Bovenberg et al., 2007](#)). However, if investors acknowledge the statistical uncertainty about return predictability ([Barberis, 2000](#)) or behave myopically and evaluate their portfolios unnecessarily frequently ([Benartzi and Thaler, 1995](#)), the effect of life horizon on portfolio choice will be limited. To our knowledge, our paper is the first to empirically investigate this matter.

Second, a central issue in household financial decision-making is how to modify one's saving and investment behavior over the life cycle. Not only horizon, but also economic attitudes, background risks, and other determinants of portfolio choice may show age-related patterns. [Harrison et al. \(2007\)](#) find in a field experiment that risk attitudes vary with age. A large and growing literature (e.g., [Bodie et al., 1992](#); [Viceira, 2001](#); [Cocco et al., 2005](#); [Benzoni et al., 2007](#)) looks into the effects of human capital and labor income on optimal portfolios. Empirically, [Poterba and Samwick \(2001\)](#), [Ameriks and](#)

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