



Understanding the heterogeneity of savings and asset allocation: A behavioral-economics perspective[☆]

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ABSTRACT

Why do saving rates and the proportion of savings invested in stocks substantially increase with income? This paper sheds light on this question from the perspective of a new bounded-rationality life cycle model. It has been shown elsewhere that this model is better than existing ones at predicting how savings and asset allocation choices vary over the life cycle. In this paper it is shown that a very simple version of the same model also allows for a better understanding of the variation in savings and asset allocation choices across income groups.

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1. Introduction

Empirically, saving rates increase substantially with income. For the U.S., saving rates are below 10 percent for the lowest income quintile, while they exceed 20 percent for the fifth quintile (Dynan et al., 2004).¹ Similarly, the proportion of savings invested in stocks increases strongly with income. Typically, the bottom two quintiles invest between 0 and 10 percent of their financial wealth in stocks. In contrast, the top quintile invests about 60 percent in stocks.²

The question why saving and investment behavior differ so much across income groups is of interest because it relates directly to the issue of adequate retirement preparation. Does adequate retirement preparation differ across income groups? Or do members of some income groups save and invest in an inadequate way? Any judgment about adequate retirement

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¹ These numbers include various forms of retirement savings.

² See Section 6.

preparation behavior requires an understanding of individuals' saving motives and how they may differ across income groups. One major aim of this paper is to shed light on this issue.

In principle, differences in saving rates and equity shares between income groups can arise from three sources. First, the nature of the budget constraint may differ between income groups due to social welfare programs. Second, different income groups may differ in financial literacy and this may lead to differences in savings and asset allocation. Third, preferences may be non-homothetic, i.e. income expansion paths for saving rates and equity shares may be non-linear.

Differing budget constraints have been put forward as an explanation for differing saving rates by Hubbard et al. (1995). They demonstrate that lower-income households have less incentives to save since they are more likely to depend on welfare programs in future bad states of the world. When it comes to *asset allocation*, the effect of budget constraints is less clear. In fact, if low-income earners are more likely to depend on welfare, this may induce them to take *more* risk in the form of a higher equity share. Furthermore, both saving rates and equity shares continue to increase for higher income quintiles where a potential dependence on welfare seems less likely.³ Thus, this pattern cannot easily be explained by referring to differing budget constraints. The same is true for fixed absolute costs of stock market participation. These may explain why individuals with low income stay out of the stock market. However, such fixed costs do again not necessarily imply that equity shares would increase with income among those participating in the stock market.

Bernheim (1998) and Lusardi and Mitchell (2007a,b) provide evidence that financial literacy is correlated with the level of education. Moreover, financial literacy is correlated with wealth accumulation and stock market participation. To the degree that the level of education is positively correlated with income, this suggests that financial literacy may explain why savings and the likelihood of stock market participation increase with income. While the evidence is strong that a higher level of financial literacy leads to higher absolute levels of savings – and thus higher wealth accumulation – there is no clear evidence that it leads to higher saving rates. Furthermore, the variation of equity shares with income has a similar shape for all education groups with at least a high school degree.⁴ The latter observation is not compatible with the view that only financial literacy, and not income itself, leads to equity shares raising with income.

In sum, differing budget constraints and differing levels of financial literacy are very likely to explain part of the variation of saving rates and equity shares over income. However, they cannot fully account for the pattern in the data. Thus, non-homothetic preferences are also likely to be part of the explanation for why saving rate and equity share profiles are jointly increasing with income. This paper puts forward a new model of non-homothetic preferences.

The analysis of this paper is based on a new bounded-rationality life cycle model, dubbed feasibility-goals (FG) model, which has been recently developed (Binswanger, 2008). The theoretical innovation of this model is that it cuts out the main source of behavioral complexity in the standard model: the requirement of contingent planning, i.e. the need for anticipating one's future actions in each state of nature. The FG model eliminates this requirement while maintaining the assumption that agents are forward-looking and prudent rather than myopic. Agents achieve such behavior by means of focusing on so-called feasibility goals. These represent levels of consumption that agents want to be feasible in certain states of nature. Importantly with regard to this paper, the structure of the FG model is such that it implies a very simple pattern of non-homothetic behavior that is governed by one single parameter.

In Binswanger (2008) it is demonstrated by means of calibrations that the FG model, while being very tractable and parsimonious, is particularly well-suited to explaining how saving and asset allocation behavior vary *over the life cycle* for a given agent. There, the analysis is carried out within a fully-fledged multiperiod setup with transitory and permanent labor income shocks.

The aim of this paper is to show analytically and numerically that a very simple two-period version of the FG model is well-suited to better understanding how savings and asset allocation vary across different income groups. I will refer to the two-period version of the FG model simply as the goal model.⁵

Due to its high transparency and conceptual simplicity, the analysis of a two-period setup is particularly insightful and provides a natural first step before moving to more complex setups to study the heterogeneity of savings and asset allocation behavior. A two-period setup represents the simplest case in which the joint decision of saving and asset allocation can be studied in a meaningful way. The setup is intended to represent a life cycle framework where agents work and prepare for retirement in the first period and live from the returns on their savings in the second. The two-period setup allows for concentrating on the variation of savings and asset allocation across different levels of lifetime (permanent) incomes and is easily accessible to an analytical examination. This is useful for developing insight into the basic mechanisms at work. Besides a theoretical analysis, I also provide simulation results that allow for a broad judgment about how well the model captures the key patterns in the data from a quantitative point of view.

The analysis includes a comparison of the predictions of the goal model with the predictions of a subclass of hyperbolic absolute risk aversion (HARA) preferences as well as with existing habit formation preferences. While the goal model explains the data very well, HARA and existing habit preferences have difficulties in accounting for the patterns observed in the data. In particular, for plausible parameters, one obtains very high and – in the case of HARA preferences – *decreasing* instead of increasing saving rates. The performance of the goal model remains superior even if the HARA and habit models are endowed

³ See Dynan et al. (2004) and Section 6 of this paper.

⁴ See Section 6 and footnote 27.

⁵ The aspect of "feasibility" is vacuous in a two-period environment.

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