



Life-cycle portfolio choice: The role of heterogeneous under-diversification

Claudio Campanale*

Dpto. Fundamentos del Análisis Económico, Universidad de Alicante, Ctra. San Vicente del Raspeig, s/n, Alicante, Spain

ARTICLE INFO

Article history:

Received 17 September 2007

Accepted 12 March 2009

Available online 5 April 2009

JEL classification:

G11

D91

E21

Keywords:

Portfolio choice

Life-cycle

Under-diversification

Retirement wealth

ABSTRACT

In life-cycle portfolio choice models it is standard to assume that all agents invest in a diversified stock market index. In contrast recent empirical evidence, summarized in Campbell [2006. Household finance. *Journal of Finance* 61, 1553–1604] suggests that households' financial portfolios are under-diversified and that there is substantial heterogeneity in diversification. In the present paper I examine the effects of heterogeneous under-diversification in a life-cycle portfolio choice model with uninsurable uncertain earnings and fixed per-period participation costs. The analysis of the model shows that realistically calibrated under-diversification gives an important contribution to the explanation of two key facts of households' portfolio allocation: the moderate stock market participation rate and the moderate stock share for participants.

© 2009 Elsevier B.V. All rights reserved.

1. Introduction

Traditional life-cycle portfolio choice models with intermediate consumption and uninsurable labor income have typically explored investors' decisions about how to allocate wealth between a risk-free and a risky asset. The assumption common to these models is that all agents face the same risky asset that can be interpreted as a stock index fund. This assumption is contradicted by abundant empirical evidence that documents that households invest in a limited number of individual stocks or mutual funds thus facing substantial idiosyncratic risk on their equity investment.¹ The empirical evidence also suggests that more financially sophisticated households, defined by greater education and wealth hold better diversified equity portfolios. In the present paper I explore the effects of portfolio under-diversification on household life-cycle asset allocation. I find that this so far overlooked feature of households' investment strategy substantially improves the ability of the model to rationalize two key empirical facts: the low stock market participation rate in the population and the moderate stock share for market participants.

The model presented here is standard in most respects. It is characterized by finitely lived households that go through the stages of working life and retirement. During working life they face idiosyncratic earnings uncertainty around a deterministic hump-shaped trend. In retirement they face constant and progressive social security benefits. They solve an optimal consumption-saving problem and make an asset allocation decision from a menu of financial assets. Asset demand is subject to a borrowing and short sale constraint. Payment of a one time initial entry cost is needed to gain access to the

* Tel.: +34 965 903614; fax: +34 965 903898.

E-mail address: claudio@merlin.fae.ua.es

¹ See for example Curcuru et al. (2007) and Polkovnichenko (2005) for the US and Calvet et al. (2007, 2009) for Sweden.

risky asset market.² The key departure from the traditional framework is the assumption that there are two mutually exclusive risky financial assets with the same mean but different standard deviation of returns. The two assets are meant to capture in a stylized way the idea of a well diversified and a poorly diversified stock portfolio. On top of the initial entry cost, investors must pay a fixed cost in each period in which they want to participate in the stock market and this cost is higher for the risky asset with lower standard deviation of returns.

The main result of this research is that allowing for under-diversification of households' stock portfolios provides an explanation to two key empirical observations: the low stock market participation rate and the moderate portfolio stock share for participants.³ The intuition for this result is the following: the increased volatility of the low cost risky asset implies that the optimal share conditional on investing in it is lower. Agents with low wealth do not find it optimal to pay the larger cost needed to buy the well diversified stock portfolio and buy the poorly diversified one, thus lowering the average conditional share in the population. At the same time both the reduced optimal share and the increased variance of returns decrease the benefits of participation for these agents. This, in the presence of the initial entry cost, deters part of them from participating altogether, thus helping to reduce the average participation rate as well. The interesting finding of the quantitative analysis of the model is that the amount of heterogeneity in the volatility of individual stock portfolios needed to rationalize participation rates and conditional stock shares falls well within the available empirical evidence.

Previous attempts at rationalizing low participation rates and conditional shares had focused on background risk and/or risk aversion. As it is well explained in [Gomes and Michaelides \(2005\)](#) this line of attack carries an implicit tension: increasing risk aversion or background risk reduces the portfolio share of stock but increases wealth accumulation as the precautionary motive for saving is strengthened, thus increasing participation. [Gomes and Michaelides \(2005\)](#) resolved the issue by assuming heterogeneity in risk aversion but at the cost that endogenously stock market participants are the more risk averse individuals which seems to contradict survey evidence that stock market participants tend to be more willing to take financial risk.⁴ The present model by focusing on the risk properties of the stock investment itself rather than on risk aversion or background risk avoids the above mentioned contradiction.

Another appealing feature of this explanation emerges when the progressive social security system is considered. As it is shown in the paper, when replacement ratios are progressive and under the standard assumption of investment in a common stock index fund, conditional stock shares are larger for households with lower permanent income, in contrast to the empirical evidence. In the present model wealthier households endogenously choose the stock portfolio with lower variance. This increases the share they optimally invest in the risky asset relative to poorer households, restoring the positive relationship between permanent income and conditional portfolio stock shares.

Given the key importance of heterogeneous stock portfolio diversification for the results of this paper it is important to insure that such an assumption is well motivated. This is the case both from an empirical and a theoretical perspective.

Empirical work on household portfolio diversification has traditionally relied either on survey data or on administrative records from brokerage houses or retirement plans. One example of the first type of studies is [Polkovnichenko \(2005\)](#). The author, using the SCF, finds that the median share of directly held stocks for equity holders declines with wealth except at the top of the distribution and that the number of directly held stocks increases from 1 in the bottom quintile to 15 in the top quintile of the distribution. Similarly, surveys about household stock market behavior conducted by the [Investment Company Institute \(1999 and 2002\)](#) show that the median number of individual stocks held is 2 for direct stock holders with less than 25 000\$ of financial wealth and 8 for those with more than 500 000\$; a similar pattern is observed when looking at stock mutual funds or at both types of equities jointly. The survey based studies, even though representative of the whole population and the whole household financial portfolio, have the limitation that they only allow to know the number of stocks or mutual funds held but not the variance of the risky portfolio, a more accurate measure of diversification since it captures also the correlation structure of stocks. In order to overcome this limitation other authors have used administrative records that also have the advantage of being subject to less reporting error. An example of this research is [Goetzmann and Kumar \(2008\)](#) who used the records of a large brokerage house and found large differences both in the number of stocks held and in estimated portfolio variances and even larger differences in risk-adjusted returns. As [Biliias et al. \(2008a\)](#) pointed out though, the behavior of investors with brokerage accounts is not representative of the whole population. Beside that, studies based on administrative records also do not cover the entire household financial portfolio. The limitations of both approaches have been overcome in recent research by [Calvet et al. \(2007, 2009\)](#). The authors exploit a data-set collected by the Swedish statistical agency that covers the whole population and has information at the individual asset level, thus allowing to compute household portfolio performance. They find that idiosyncratic

² The core of these assumptions is shared by most other models in the literature. See for example [Campbell et al. \(2001\)](#), [Cocco et al. \(2005\)](#) and [Gomes and Michaelides \(2005\)](#) for finite-horizon models; [Haliassos and Michaelides \(2003\)](#) and [Heaton and Lucas \(1997, 2000\)](#) for infinite-horizon models.

³ There is by now a large literature documenting this and other empirical facts about households' portfolio allocation. Two very useful surveys that summarize those findings are [Curcuru et al. \(2007\)](#) and the book edited by [Guiso et al. \(2001\)](#).

⁴ The Survey of Consumer Finances asks a question about the willingness to take financial risk to earn higher returns. Econometric analysis by [Bertaut and Starr-McCluer \(2000\)](#), [Curcuru et al. \(2007\)](#) and [Haliassos and Bertaut \(1995\)](#) found that positive answers to this question correlate positively with stock market participation. To the extent that the answer to that survey question reflects risk aversion this suggests that it is the less risk averse individuals who participate in the stock market.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات