



Life-cycle stock market participation in taxable and tax-deferred accounts

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ABSTRACT

The stock market participation patterns differ significantly in taxable (TAs) and tax-deferred accounts (TDAs). This paper develops a quantitative life-cycle model to study the optimal stock market participation choice for households with assets in both TAs and TDAs. We find that differential costs of stock market participation in the two accounts explain the higher participation rate in TDAs early in life relative to TAs and the increasing stock market participation rate in TAs over the life cycle. We also show that the differential tax treatment between TAs and TDAs is responsible for the decline in the participation rate in TDAs late in life, while the basis-reset provision of the tax code is not quantitatively important.

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1. Introduction

A robust empirical finding suggests that a large number of U.S. households do not hold stocks.¹ For example, only 51% of U.S. households hold stocks either directly or indirectly (e.g., through pension funds) according to the 2001 Survey of Consumer Finances (SCF). This empirical fact is puzzling, as standard models, given the equity premium and the assumption of CRRA preferences, predict that all households with positive savings should participate in the stock market. This observation has generated a number of studies exploring potential explanations for the limited stock market participation puzzle.²

However, the literature has largely abstracted from the difference between taxable accounts (TA) and tax-deferred accounts (TDA).³ Fig. 1 plots the stock market participation rates in the TA and the TDA for households with assets in both accounts in the 2001 SCF.⁴ It appears that the stock market participation patterns are very different in these two accounts.

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¹ See Mankiw and Zeldes (1991), Bertaut and Starr-McCluer (2002), Vissing-Jorgensen (2002), Ameriks and Zeldes (2004), and Campbell (2006).

² Heaton and Lucas (2000) offer positive correlation between stock returns and earnings shocks as an explanation. Vissing-Jorgensen (2002), Haliassos and Michaelides (2003), and Gomes and Michaelides (2005) suggest stock market entry costs. Davies et al. (2006) consider a wedge between borrowing costs and the risk-free investment return. Fratantoni (2001), Cocco (2005), Yao and Zhang (2005), and Becker and Shabani (2010) study the effects of housing and mortgage debt on stock holdings.

³ A notable exception is Gomes et al. (2009). The authors focus on the effect of tax-deferred accounts on household savings and explicitly consider two types of households. The first type only holds stocks in the TDA, while the second type can hold stocks in both accounts.

⁴ Similar patterns can be observed in the 1998 and 2004 SCFs.

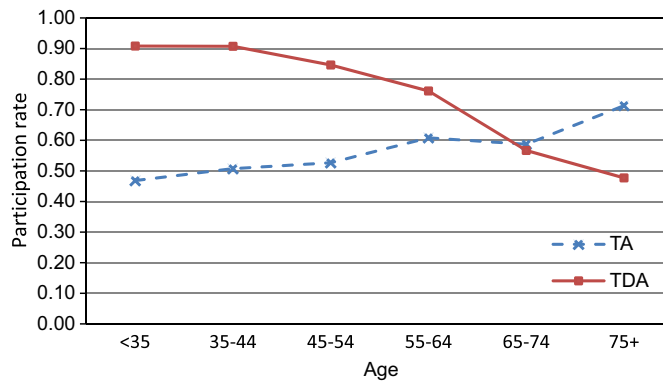


Fig. 1. Stock market participation for households with both accounts: 2001 SCF.

The participation rate generally increases with age in the TA and decreases with age in the TDA.⁵ Given that households hold a great deal of wealth in both accounts and the stock market participation patterns in these accounts seem different, it is important to simultaneously study the stock market participation choice in both accounts for a potential resolution of the participation puzzle.⁶

This paper studies the optimal stock market participation choice for households with assets in both taxable and tax-deferred accounts. We develop a quantitative life-cycle model of portfolio choice, which incorporates several key features into the standard life-cycle model: (i) Epstein–Zin preferences; (ii) moderate heterogeneity in risk aversion; (iii) a progressive tax system with a basis-reset provision⁷; and (iv) households have access to both taxable and tax-deferred accounts and stock market entry costs exist in both accounts.

The intuition of these features is as follows. Epstein–Zin preferences allow us to separate risk aversion from the elasticity of intertemporal substitution (EIS). Households with higher risk aversion and higher EIS accumulate more wealth.⁸ Together with moderate heterogeneity in risk aversion, Epstein–Zin preferences help to generate a wealth distribution in the model that roughly matches the one observed in the data. A realistic tax system is also necessary, as it accurately measures taxes on each asset in an environment where households' income has a life-cycle pattern and households have access to tax-deferred accounts.

Previous studies have considered stock market entry costs, which are a one-time cost paid by investors to participate in the stock market.⁹ The entry costs represent a combination of explicit and implicit hurdles such as information acquisition about investment opportunities, more complicated tax filling, the value of time spent to learn how to trade and rebalance a portfolio, and set-up fees (time and/or money). Alternatively, entry costs may be an economist's description of psychological factors that make equity ownership uncomfortable for some households (Campbell, 2006, p. 1569).¹⁰ In this paper, households have access to both taxable and tax-deferred accounts. We consider stock market entry costs in both accounts. However, the entry costs in the TDA are set to be much lower than those in the TA. This is because employer sponsored tax-deferred accounts normally provide uniform and simple vehicles for employees to make an investment choice. This makes access to the stock market much easier in the TDA than in the TA.¹¹

The model predictions are broadly consistent with the data. We find that the stock market participation rate in the TA is generally increasing with age in the model. This is because we introduce stock market entry costs. As households age, they accumulate more wealth in the TA, and it becomes worthwhile for them to pay the entry costs. Note that the stock market participation rate in the TA for households below age 45 increases much faster in the model than in the data. For reasonable parameter values the model also generates a decline in the stock market participation rate in the TDA for old households. However, the participation rate does not fall sharply in the model as in the data.

⁵ We acknowledge the well-known identification problem of time, age and cohort effects.

⁶ Examples of tax-deferred accounts in the United States include Individual Retirement Accounts (IRAs), KEOGH, and employer sponsored defined contribution plans such as 401(k) and 403(b). According to the 2001 SCF, more than 40% of households have assets in both taxable and tax-deferred accounts. For these households, assets held in tax-deferred accounts accounted for more than 30% of their total financial assets. In 2003, IRA assets stood at 2.8 trillion, and 401(k) assets were estimated at 1.8 trillion (Vanguard Group, 2004).

⁷ The current tax code in the United States allows the tax basis of an inherited asset to be reset to the prevailing market price upon the death of the original owner/investor. In other words, the capital gains taxes are forgiven for inherited stocks. However, this basis-reset provision only applies to stocks held in taxable accounts.

⁸ This result depends on the time-preference-adjusted rate of return on saving. See Campbell and Viceira (1999) for a good discussion.

⁹ See Basak and Cuoco (1998), Haliassos and Michaelides (2003), Gomes and Michaelides (2005), and Alan (2006), among others. Moreover, recent empirical work suggests that small entry costs can be consistent with the observed low stock market participation rates (Paiella, 2001; Vissing-Jorgensen, 2002).

¹⁰ The entry costs may also be used to capture investor inertia.

¹¹ For example, there are no set-up costs associated with investment in stocks in employer sponsored tax-deferred accounts.

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