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ARTICLES

Dollar-Cost Averaging and Prospect Theory Investors: An Explanation for a Popular Investment Strategy

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Abstract

Dollar-cost averaging requires investing equal amounts of an investment sum step-by-step in regular time intervals. Previous studies that assume expected utility investors were unable to explain the popularity of dollar-cost averaging. Statman [1995] argues that dollar-cost averaging is consistent with the positive framework of behavioral finance. We assume a prospect theory investor who implements a strategic asset allocation plan and has the choice to shift the portfolio immediately (comparable to a lump sum) or on a step-by-step basis (dollar-cost averaging). Our simulation results support Statman's [1995] notion that dollar-cost averaging may not be rational but a perfectly normal behavior.

Keywords:

Dollar-cost averaging Lump sum investing Behavioral finance Prospect theory Monte Carlo simulation Bootstrap simulation

Notes

1. Fisher and Statman [1999] use a similar framework to analyze time diversification.

2. See Statman [1995], p. 74.

3. See Tversky and Kahneman [1992], p. 298.

4. As an example, Statman [1995] discusses defined-contribution pension plans, such as 401(k)s, where employees do not have an explicit choice between a lump sum investment and a dollar-cost averaging investment. See Statman [1995], p. 76.

5. Therefore, the results of Frühwirth and Mikula [2008] are not surprising. They compare a 10-year lump sum investment with a 10-year dollar-cost averaging strategy based on yearly payments. With a high equity risk premium, one would expect that the lump sum strategy dominates the dollar-cost averaging strategy over this long time horizon.

6. Prior studies also use a one-year time horizon to analyze dollar-cost averaging (e.g., Williams and Bacon [1993], Thorley [1994], Bacon et al. [1997], Abeysekera and Rosenbloom [2000]). Moreover, Benartzi and Thaler [1995] support the hypothesis that a one-year time horizon is most appropriate when evaluating investment performance.

7. Framing refers to the experimental observation that the way a problem or decision is presented to the decision maker will affect his action.

8. See Ingersoll [2008] for a discussion of other shortcomings of the single-parameter probability weighting function suggested by Tversky and Kahneman [1992].

9. Breuer and Perst [2007] use the same parameter values in their study.

10. See Tversky and Kahneman [1992], p. 301. They also describe the special properties of the weighting functions in Equation (3) and provide a simple numerical example.

11. See Dimson et al. [2006], p. 29; Dimson et al. [2002], p. 19.

12. Abeysekera and Rosenbloom [2000] also base their simulations on a 20% annual stock market volatility.

13. See Dimson et al. [2006]. They document a high volatility around 30% p.a. in the German, Italian, and Japanese stock markets over a long period of time (1900–2005).

14. There may be other reference points, for example, the return target derived within an asset-liability analysis for a specific investor. However, such a reference point is highly investor-specific, and the results cannot be generalized. Furthermore, as other studies also use the zero return and the risk-free rate as reference points (e.g., Hens and Bachmann [2008]), we believe that this is a representative choice for our study.

15. For simplification, we implemented a statistical test only for cumulative prospect values.

16. The parameters recommended in Abdellaoui et al. [2005] are also used in the study of Breuer and Perst [2007].

17. The risk-free rates are average values from the Frankfurt money market.

18. As we simulate continuously compounded monthly returns with the geometric Brownian motion, we also analyze the statistical properties of the continuously compounded real return data. In this way, we see the fittings and the differences between our simulated returns and real return data.

19. See Brennan et al. [2005], pp. 529–530; Campbell et al. [1997], pp. 66–68.

20. Statistical hypothesis tests (e.g., the paired t-test used in this study) usually assume independent observations. In a traditional bootstrap approach the independency assumption is hurt, as the sample elements are drawn with replacement. In the block bootstrap approach conducted in this study, this effect leads to an overlapping in the 12-month return series. See also Durand et al. [2004].