

Strategic Asset Allocation

Authors: **John Y. Campbell** and
Luis M. Viceira
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Reviewer: **Sherman D. Hanna**
Professor
Ohio State University

The authors of this book point out that "... long-term investors receive curiously little guidance from academic financial economists." Often when my graduate students have taken courses in finance, even several graduate level investment courses, they do not seem to have much idea about how to translate theory into advice for clients. Many of the concepts of academic finance, such as mean-variance analysis, seem at first glance to be potentially useful, but upon further reflection, often have limited practical value. My favorite example of this is the standard graph showing return versus risk (expressed as the standard deviation of returns.) All you have to do is to pick your level of standard deviation, and then find the portfolio with the highest expected return for that level of risk. Or you can proceed in the opposite direction, choosing a target return and finding the portfolio with the lowest risk for that expected return. However, when I ask how they would establish the appropriate maximum level of risk or minimum level of return, I get puzzled looks from my graduate students, and I suspect that many financial economists would not provide a good answer either.

This book provides many insights into long-term investing, yet part of it has extremely challenging mathematics. If you can understand their explanation of the martingale approach, you are operating at an advanced level. However, the book does offer some understandable conclusions. One focus is on the question of how much of one's portfolio should be devoted to stocks. Malkiel (1973) has addressed this question in various editions of his remarkable book. His recommendation has been a variation on the guideline that one's stock percentage should be 100 minus age. In the old rule of thumb, with origin unknown to me, a 20 year old should have 80% of the portfolio in stocks, and an 80 year old should have 20% of the portfolio in stocks, in each case, with the remainder in bonds and/or cash equivalents. For most investors, the home represents such a large investment that it suffices for the real estate component of total wealth.

Hanna and Chen (1999) and Kish and Hogan (2000) demonstrate that for longer holding periods, stocks, and especially small stocks, dominate other financial investments. The type of analysis reported in these two articles is non-parametric projection --- in effect, assuming, for instance, that the next 20 years will be based on drawing at random all 20 year periods observed in the past. The authors also assumed that investors buy and hold their investments, have a diversified portfolio matching the relevant Ibbotson categories (i.e., index funds) and only care about the accumulation at the end of the holding period.

Hanna and Chen (1997) addressed the more difficult question of finding the best portfolio for shorter periods of time. They also assumed that an investor would buy and hold a portfolio and would only care about the accumulation at the end of the period, but they also took into account risk by specifying a utility function. This is an approach not used much in the past, certainly not much before 1985, because most economists assumed that you could not measure one's risk aversion. However, as discussed by Hanna, Gutter and Fan (2001), a series of hypothetical questions can be posed that can be related to a person's risk aversion level. Hanna and Chen (1997) assumed that one's expected utility is related to one's total wealth, including human wealth, because that determines the potential consumption one can enjoy. They also assumed that the relationship of utility to wealth is what is known as a Constant Relative Risk Aversion (CCRA) utility function. They mentioned research by Lee and Hanna (1995) showing that for most U.S. households, financial investments represented a very small proportion of total wealth. The finding was replicated for more recent data by Gutter (2000), who found that for over half of households in 1998, financial investments represented less than 1% of total wealth. Hanna and Chen also assumed that human wealth had no risk and was uncorrelated with the returns on financial assets. Based on these assumptions, Hanna and Chen proposed that objective risk tolerance, which some have called risk capacity, is related to

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investment horizon and the ratio of the investment portfolio to total wealth. For most households, the ratio of the investment portfolio to total wealth is very small, so for horizons of five years or more, they are objectively risk tolerant. If the investment portfolio represents only 10% of total wealth, then even a 50% decrease in the stock market index would only represent a 5% decrease in the household's wealth, and therefore in potential consumption.

Hanna and Chen (1997) proposed that subjective risk tolerance should be related to relative risk aversion, with high risk tolerance being low levels of relative risk aversion, e.g., 2.0, moderate risk tolerance being a level of 6.0, and low risk tolerance being a level of 10.0. Based on all of their assumptions, a household with financial assets representing 10% of wealth should have 100% small stocks for a one year horizon, though for those with low risk tolerance, the small stock proportion drops to 84% for a five year horizon, with the rest in large stocks. If we add plausible assumptions about accumulations of financial investments by age to their Figure 2, the proportion of the financial investment portfolio in stocks (large plus small) would be about 100% until about age 50 for most households, then start decreasing. Given the results on relative risk aversion found by Hanna et al. (2001), it is likely that most people have a relative risk aversion level between 2.0 and 12.0, with half of the population between 3.0 and 8.0. Therefore, for many households, risk tolerance would not matter much for investing for retirement until they got within 10 years of retirement, as the optimal portfolio would be about 100% stocks.

Another interesting issue is whether risk aversion changes with age. If the financial investment portfolio represented all of one's wealth, then the CCRA utility function implies that the risky asset proportion would remain the same as long as one's risk aversion level remained the same, regardless of the level of total wealth. However, allowing for other wealth such as human wealth, and the typical accumulation of financial assets over the life cycle, the results by Hanna and Chen suggest that the stock proportion of the optimal portfolio will decrease as retirement approaches. Wang and Hanna (1997) found that the proportion of total wealth represented by risky assets (broadly defined) did not decrease with age.

Campbell and Viceira address many of the same issues examined by the articles listed above, though at a much more abstract level. For instance, they present a table (p. 188) based on simulations, that has for someone

with a relative risk aversion level of 2.0 and whose human capital has a zero correlation with financial investments, the optimal stock proportion would be 184% when 35 years from retirement, 114% when 10 years from retirement, 97% when five years from retirement, and 80% when retired. Having a ratio greater than 100% means investing on margin. The corresponding proportions for someone with moderate risk tolerance (relative risk aversion equal to 5.0) are 42%, 35% and 32%. The corresponding proportions for someone with very low risk tolerance (relative risk aversion equal to 12.0) are 24%, 17% and 13%. For people whose human capital is correlated with financial investments, the corresponding stock percentages are somewhat lower in each case.

With a somewhat different set of assumptions (p. 218) the authors conclude that for relative risk aversion of 5.0, the stock proportion of financial investments would remain high throughout life, but for low risk tolerance, the stock proportion would go from 97% at ages 20-35 to 57% at ages 66-80. As the authors summarize their conclusions (pp. 219-220):

First, risky assets should be extremely attractive to typical young households with many years until retirement and modest savings. Such households have large human wealth relative to financial wealth, and their human wealth is relatively safe; thus they should be willing to tilt their financial portfolios strongly toward risky assets.

Second, the attractiveness of risky investments diminishes later in life as human wealth declines and financial assets accumulate. Third, there is considerable heterogeneity across households in their income processes and hence in their optimal investment strategies. Self-employed college graduates, for example, have riskier income that is more highly correlated with stock returns. These households own private businesses that are exposed to many of the same risks as publicly traded companies; they should scale back their financial risks accordingly.

The authors also note that their prescriptive results do not match actual portfolio patterns by age very well, "... very few households are as aggressive as would be recommended by our calibrated life-cycle model." They also note that their model ignores housing, and also fixed commitments should as providing education for children. It would be appropriate to have a more conservative portfolio for shorter term goals such as building a college fund. The authors show that

monetary assets, including Treasury bills, are poor investments for those with long horizons. However, Treasury inflation-indexed bonds may be appropriate, and are a good choice for retired households with low risk tolerance.

There is much of value in this book that is accessible to readers who are not mathematically inclined, but only those who have taken several Ph.D. level finance courses in the past 10 years are likely to completely understand the assumptions and methods.

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