Investing: Regular investments

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The common pattern of saving for retirement is not investing a large lump sum, but rather saving a small amount every month.

Figure 1(a) shows that if one invests \$5 000 a year for thirty years, the distribution is narrower than for a lump sum (see "Investing: Risk and return"). Figure 1(b) is equivalent of the active allocation described in "Investing: Time matters" in the case of a regular investment. It shows a rapid drop after the objective, as expected.

Figure 2 shows that, as was already seen with a lump sum, an active allocation outperforms regardless of one's target. The gain is nearly 10% for an objective around \$300 000, and stays above 5% between \$240 000 and \$550 000. As with lump sums, if one has a precise enough objective it is possible to far outperform a passive allocation by changing one's allocation based on how well one's portfolio is doing (but calculating the allocation is more complicated in this case).

Figures 2 and 3 show that, with an active allocation, saving \$8 600 a year for thirty years gives an 80% probability of having \$500 000 after thirty years. But if one wants a 90% probability then \$10 500 a year is required, and \$15 300 for 99% (corresponding to saving \$460 000 over thirty years, i.e. 92% of the final amount). Figure 3 clearly shows that the less time one has and the greater certainty one wants, the more money is needed: for a 90% probability after 20 years one must set aside 80% of one's target, against less than 20% for a 50% chance and 43 years. Certainty costs money.

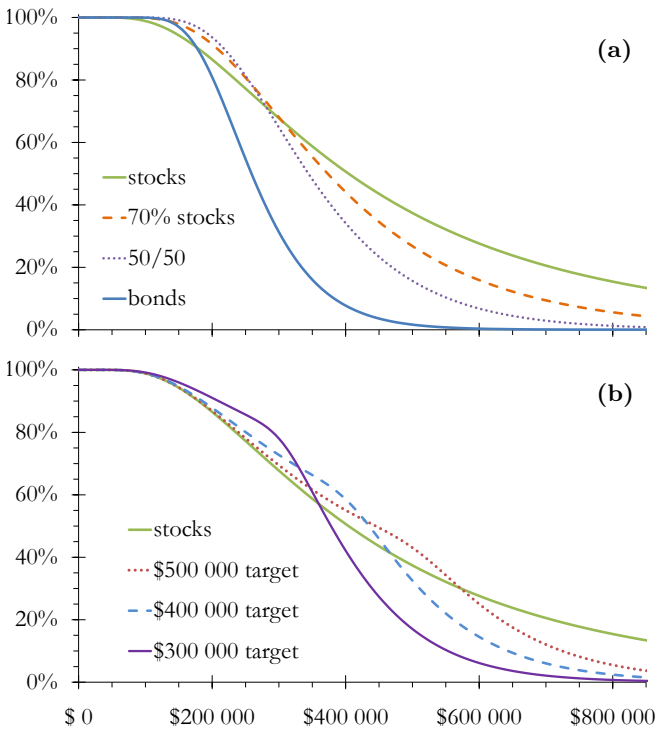

FIG. 1: Cumulative distribution of the possible value of an investment of \$5 000 a year for thirty years (in today's money). (a): passive allocation and (b): active.

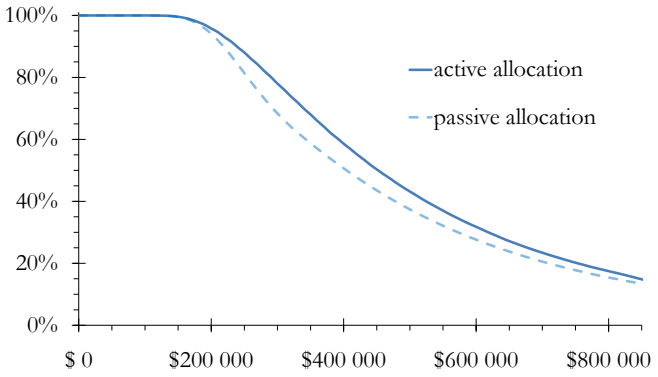

FIG. 2: Cumulative distribution for an annual investment of \$5 000 for thirty years.

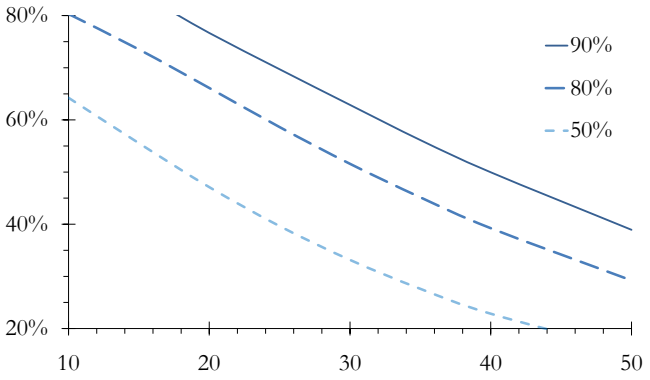

FIG. 3: Total savings (annual investment times number of years) needed to have a certain probability of having \$500 000, divided by \$500 000 (as a function of length of contribution).