

## WHAT REPLACEMENT RATES SHOULD HOUSEHOLDS USE?

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The target replacement rate — the amount of income in retirement needed to maintain pre-retirement living standards — is a workhorse concept in the financial planning literature. Typical advice suggests that replacement rates should be 70 to 85 percent of pre-retirement income.

This paper focuses on two questions. First, what is the level and distribution of *optimal* replacement rates, and how do these compare to the conventional financial planning advice of 70 to 85 percent? Second, are there systematic characteristics that are correlated with optimal replacement rates that are higher or lower than the common advice? Or are household circumstances, as reflected in the HRS data, sufficiently idiosyncratic that rules of thumb cannot reasonably capture the implications of an optimizing model?

We compute optimal target replacement rates for a sample of retired households from the Health and Retirement Study. The sample is restricted to those with at least 30 years of earnings. Our measures come from a life-cycle model that accounts for uncertainty in earnings, health shocks, and longevity. Crucial inputs for our calculations are earnings realizations, beginning as early as 1951, drawn from restricted access social security earnings records. Our calculations are made for 2004 and indicate the flow of social security, defined-benefit (DB) pension, and other forms of wealth (drawn as an annuity), divided by average lifetime income (or a high five years of income) that is needed to equate the discounted marginal utility of consumption across time.

We find a median optimal target replacement rate of 75 percent for married couples (and 55 percent for singles). This similarity does not validate the commonly used rules of thumb, however. At most 15 percent of the households in our sample fall into the 65 to 90 percent range. At least 48 percent of sample households have optimal target replacement rates below 65 percent, the lower bound commonly used in popular financial planning advice.

A large number of factors will affect optimal target replacement rates. Optimal rates will be larger for couples than for singles. The evolution of average tax rates will have a substantial effect on optimal replacement rates. The reduction in average tax rates over the period we study, particularly for affluent households, implies that replacement rates for high-income households are lower than they otherwise would be absent the tax changes. In fact, in evidence from median regressions, optimal target replacement rates for married couples are substantially lower in the top three lifetime income deciles than they are in the first four deciles, conditioning on education, race, children and other factors. This pattern is largely driven by the evolution of average effective tax rates experienced by high-income households in our sample. Of course, if taxes increase in the future, replacement rates will need to reflect tax increases that will be borne by high-income households.

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The timing of earnings shocks will have important effects on optimal target replacement rates. Shocks to earnings have considerable persistence. Consequently, a household that gets a positive late-in-career earnings shock would be expected to have replacement rates that are higher than the average of pre-retirement earnings. Similarly, a negative late-in-career shock could cause living standards to be sharply revised downward in retirement. The pattern of earnings realizations is particularly important after the period when children leave the household. Children increase the consumption needs of the household: hence, households will do less retirement wealth accumulation when children are present than they otherwise would. Earnings shocks from the late 40s to mid-to-late 50s can have a very substantial effect on optimal replacement rate targets.

Medical expenses can also push optimal target replacement rates up for high-income relative to low-income households. A “Medicaid-like” safety net program in the model covers medical expenses for families with health shocks and insufficient private wealth to cover them. Consequently, a low-income household need not accumulate to “self-insure” against out-of-pocket medical expenses. High-income households do self-insure. Of course, out-of-pocket medical expenses increase with age. Moreover, these shocks are persistent. Optimal wealth decumulation patterns will reflect the possibility of persistent medical expense shocks and life-cycle households (particularly affluent ones) will preserve resources in order to maintain their discounted marginal utility of consumption, given these shocks. The positive coefficient on age in our median regression evidence also reflects this phenomenon.

Our median regression evidence reveals a third strong positive correlate of optimal target replacement rates: educational attainment (the first two are the household’s lifetime income decile and age). Education is correlated with two things that affect replacement rates. The most important is the pattern of earnings shocks. Conditioning on lifetime income decile and other characteristics, the likelihood of receiving a positive income shock is positively correlated with education. Put differently, high education types are more likely to get positive late-career income shocks (holding income decile constant) than those with lower educational attainment. Out-of-pocket medical expenses (and their expectation) also appear to be positively correlated with education.

Given the range of factors affecting replacement rates and the varied experiences of typical households, we are skeptical of the value of common rule-of-thumb target replacement rates, such as those embodied in many web-based financial planning products. We recognize the value of financial education and further understand that the replacement rate is a simple, teachable concept. We nevertheless think more refined guidance is needed to serve households well. While we have not yet solved the problem of what should replace replacement rates, we hope this work guides the concept’s evolution in a more helpful direction.

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