

How Much Retirement Income Is Needed to Maintain the Living Standard?

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The proportion of individuals aged 65 and older has been increasing in the majority of developed countries, going along with an increase of the retired population. For the coming decades this process of population aging is expected to continue. This puts social security systems under pressure, and public pension schemes in particular. As a reaction, public pensions have been reduced in many countries, leading to a decrease in pension replacement rates, i.e., retired persons receive a smaller share of their previously earned labor income. For instance, while up to the early 90s the German statutory pension scheme provided average net replacement rates of about 70%, this number has decreased to 53% in 2014 (OECD 2015).

Private and occupational schemes have become more important due to this decline in replacement rates provided by public pensions. How much individuals need to save in addition to public pensions to compensate for the decrease in replacement rates is unclear, though. The question is how high the replacement rate needs to be.

While several heuristics can be found in the literature, usually suggesting replacement rate of around 70% (Haveman 2007, Benartzi 2012), they lack an empirical basis. Empirical approaches are less common and lead to conflicting results. One example are approaches based on economic life cycle models, which yield a broad range of replacement rates. For instance, Hammermesh (1984) report findings for the US between 80 and 90 %, while one can derive a replacement rate of 66% from the model of Scholz 2006.

This paper contributes to the literature by proposing, applying, and comparing three approaches for the estimation of optimal replacement rates. We define "optimal" replacement rates as what we will call "constant living standard net replacement rates" (CLS-NRR). They capture how much retirement income is needed to achieve the same living standard as during working life. As such they can be used as a guideline for individual savings and as a reference point for assessing pension adequacy.

The three approaches we use vary considerably in complexity and the underlying assumptions. For all of them the basic idea is similar to the estimation of equivalence scales. Essentially, given data on one or several welfare indicators, the income levels of retired and pre-retired individuals are sought which give the same values for the welfare indicators. Apart from this basic idea, approaches differ considerably. The first approach is in the spirit of Engel (1857) and fully parametric, the second approach was originally proposed by Pendakur (1999) and is semiparametric, and the third one is nonparametric and based on

Dudel (2015). The parametric approach has the virtue that it is easily understood and implemented, but it rests on strong assumptions. The nonparametric approach, on the other hand, is more complex and computationally intensive, but avoids restrictive assumptions of the parametric approach. The semiparametric approach falls in between.

The results for this preliminary version are based on the German Income and Expenditure Survey 2013. For the final paper, we apply the approaches to the US (using the Health and Retirement Study) and England (using the English Longitudinal Study of Ageing).