Retirement Savings

3

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Prescriptions for Retirement Savings

Goal-Directed Planning

Robinson (2000) and Ho, Perdue, and Robinson (2006) described goal-directed planning and provided a formula to describe the usual approach that financial planners and many households use to reach goals. Applying their concept to retirement planning, the fundamental equation for financial planning is based on the idea that the household should set its spending in each future period so that it will have enough wealth when it reaches retirement to meet its goal. The following formula shows what the household needs to accomplish:

$$W_n = W_0(1+r)^n + \sum_{t=1}^{n}(E_t - C_t)(1+r)^{n-t} \quad (3.1)$$

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We discuss the formula in terms of annual periods, though it could be applied to monthly periods. W_n = wealth in terms of investment assets in the year n when the household reaches retirement, W_0 = initial investment assets, r = rate of return per year, t = year, n = number of years until retirement, E = net earnings in a year, C = consumption or spending in a year.

For instance, assume that a household wants to have its assets at retirement, W_n, equal to $1,000,000. It currently has investments, W_0, equal to $50,000. The rate of return it can obtain on investments, r, is equal to 6 % per year. Retirement is n years away, where $n = 30$. The calculation of the amount needed to be saved out of earnings each year, $(E_t - C_t)$, can be easily done with a financial calculator, if the amount is assumed to be constant. If the amount to be saved each year is allowed to vary, a spreadsheet is needed for the calculation. If all amounts are in inflation-adjusted dollars and a constant amount is to be saved at the end of each year, $(E_t - C_t)$ is $9,016.

The calculations are more complicated with amounts expressed in nominal dollars. If a household saves the same nominal amount each year, the inflation-adjusted amount to save each year would be much greater at younger ages than it would be at older ages when real income might be higher. Even if all amounts are expressed in inflation-adjusted dollars, the projected earnings might change with anticipated career advancement and changes in labor force participation of

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the household members. A spreadsheet can be used to find the amount to save each year, if there is a simplifying assumption, for instance, that the household should have constant spending each year before retirement. Some textbooks (e.g., Dalton & Dalton, 2014) suggest doing calculations to obtain needed contributions in nominal amounts, but the standard approach by economists is to do all calculations in inflation-adjusted amounts and use inflation-adjusted rates of return (e.g., Scholz, Seshadri, & Khitatrakun, 2006).

The goal-directed approach does not provide us directly with how much should be saved each year for retirement, as a complete solution requires a specification of the retirement spending goal. For instance, a household might have a goal of having a particular standard of living in retirement, perhaps the same as before retirement. Given a particular retirement spending goal, it is easy to calculate the amount of retirement assets necessary to generate enough investment income to supplement other sources of retirement income, including Social Security, employer provided defined benefit pensions, and employment income of household members. One important question is whether to purchase an immediate life annuity at retirement or to withdraw some amount from investment assets each year. An immediate life annuity is a contract from a financial company that agrees to pay a person a fixed amount per year as long as that person lives. The annuity can also be written for a couple or other type of household so that if one person dies, the surviving household members continue to receive some income. Poterba (2014) presents annual payouts available from annuities as of 2013, and the payouts for annuities that would provide some inflation protection imply that a single 65-year-old female wanting to generate income of $50,000 per year with purchasing power maintained would have accumulated over 1 million dollars if she planned to buy an immediate annuity at retirement.

If a life annuity is not purchased, there is a possibility that a retiree who lives much longer than average would eventually run out of investment assets, especially with high inflation and/or poor investment performance. Finke, Pfau, and Blanchett (2013) concluded that it would not be prudent to withdraw more than 3 % per year of the portfolio value at retirement, which would imply that almost 1.7 million dollars would be needed to generate an income of $50,000 per year with inflation protection. A very conservative portfolio would be more likely than a stock portfolio to be depleted because loss of purchasing power for the conservative portfolio would be likely to have a greater impact than stock market declines on a stock portfolio (Finke et al., 2013; Ho et al., 2006). There have been a number of analyses of portfolio strategies during retirement, including starting retirement with lower stock allocations if stock valuations are elevated, and letting the stock percentage of the total portfolio increase during retirement (Kitces & Pfau, 2015).

It is simpler to consider calculating the amount needed based on the assumption of purchase of an immediate annuity at retirement. Consider a worker expecting a Social Security pension of P dollars per year at retirement, at which time he would have a life expectancy of n years. The worker wants to spend C dollars per year in retirement, and does not plan to work during retirement. If C is greater than P, the worker needs to generate $(C-P)$ dollars per year from investments during retirement. If money withdrawn from retirement investments is subject to income taxes, some adjustment is needed to account for that, but in the rest of our example we will ignore income taxes, which might be appropriate for someone who had invested in a Roth IRA for a long time. If the worker could obtain a life annuity with an inflation-adjusted rate of return of r, the amount he would need to accumulate by retirement would be equal to the present value (PV) of a payment of $(C-P)$ dollars per year for n years at an interest rate of r:

$$PV = (C-P)(1+(1-1/(1+r)^{(n-1)})/r) \quad (3.2)$$

Equation (3.2), based on receiving the annuity payments at the beginning of each year, would produce a PV of $696,987, given desired annual spending, C, of $50,000, a Social Security pension, P, of $15,000 per year, expected remaining lifetime, n, of 25 years, and an after tax inflation-adjusted interest rate r of 2 %. For the

financial planning approach, the remaining calculations could be based on Eq. (3.1), with W_n equal to the PV calculated from Eq. (3.2). For instance, consider a 35-year-old worker with no accumulated retirement savings, with 30 years until retirement, who could obtain an inflation-adjusted rate of return of 6 % per year on investments before retirement, and would contribute the same amount per year in constant dollars. The amount at the end of each year to contribute, A, would be

$$A = r W_n / ((1+r)^n - 1) \tag{3.3}$$

For the assumptions listed above and the goal of accumulating $696,987 by the start of retirement, the worker would need to contribute $8,816 at the end of the first year, and then increase the annual contribution with inflation each year. At the end of 30 years the worker would have accumulated $696,987 in terms of purchasing power at age 35, so it would be possible to spend $50,000 per year during retirement.

In general, one should estimate what current investments and projected contributions to retirement investments will grow to by retirement, and compare the estimated accumulation to the amount needed to fill the gap between desired spending and the Social Security or other defined benefit pensions. There are many more complications to consider, including the fact that it is difficult to purchase an annuity that would provide a true payment adjusted for inflation, but this example provides the essence of the calculations needed for advice to households. If a worker would be unwilling to use accumulated investments to purchase an immediate annuity at retirement, the amount needed to accumulate would be higher than the amount calculated using Eq. (3.3), and there would be challenges in terms of safe withdrawals during retirement (e.g., see Finke et al., 2013; Kitces & Pfau, 2015).

Households that can start investing 20–30 years before retirement should initially invest very aggressively in diversified mutual funds with stocks and perhaps real estate. If they can avoid using retirement investments for other purposes, they should be able to accumulate enough for a comfortable retirement. The assumptions made about pre-retirement consumption patterns are arbitrary without some additional assumptions. For instance, there is the well-known idea that because of the power of compounding, early saving is much more powerful than later saving. However, typically inflation-adjusted household income increases substantially with age until about age 50, and then decreases slightly until retirement. Therefore, it may be very difficult for a 25 year old to save and also achieve a desired current standard of living. Table 3.1 shows the pattern of US household income in 2013, and the percent of income spent, by age. The pattern is based on a cross-section of US households and therefore does not represent any particular household's pattern over time. The pattern does suggest that households typically do not try to save a constant percent of income, but instead save a higher percent of income when income is high. In the 35–44 age range, when mean income is highest, the percent of income saved (not spent) is the highest. The pattern is consistent with the life cycle savings model, discussed in the next section.

The Life Cycle Savings Model

Modigliani (1986) reviewed research that attempted to explain patterns of spending and saving, including Milton Friedman's permanent income model and the life cycle savings model. The life cycle savings model, though developed to explain household saving patterns, is a prescriptive theory that assumes a household will maximize expected lifetime utility from consumption. Modigliani (1986) noted that in the original version, a number of simplifying assumptions were made, including zero real interest rates. Given the assumptions, households would have the goal of having the same consumption each year, and assuming constant real income before retirement, a household should save the same percent of income each year, and should accumulate enough investment assets so that it would be able to maintain the same consumption in retirement as it could have before retirement.

Table 3.1 Household Aftertax income and expenditures as percent of Aftertax income, 2013

	Age of householder						
	Under 25	25–34	35–44	45–54	55–64	65–74	>74
Income after taxes	24,406	48,000	62,361	60,743	56,719	45,909	31,912
Average annual expenditure	28,220	42,909	51,993	53,219	49,299	43,924	33,550
Expenditures/Aftertax income	115.6 %	89.4 %	83.4 %	87.6 %	86.9 %	95.7 %	105.1 %

Calculated by authors based on data at bls.gov. Results for 2013 Consumer Expenditure Survey, with contributions to Social Security and pension plans excluded from income and expenditure amounts

Applying the Life Cycle Model to Retirement Planning

The life cycle model is concerned with maximizing utility from consumption over a lifetime, so some types of spending should be excluded from consideration, such as some employment-related expenses. Some types of consumption may be related to the household's leisure time, for instance, a household with limited vacation time might not be able to enjoy travel until retirement, so the household might want to plan for higher total consumption in retirement. Medical expenses typically are much higher in retirement, so a household might want to plan for higher total spending in retirement to maintain the quality of life. Financial planning textbooks specify retirement income goals as proportions of pre-retirement gross income, e.g., 60–80 %, and as an alternative, also suggest detailed analyses of a household's budget before and after retirement (e.g., Dalton & Dalton, 2014). Most of the difference between pre-retirement gross income and after-retirement gross income needed is typically assumed to be based on differences in taxes and saving for retirement each year before retirement, plus some employment-related expenses before retirement, so that the implicit goal might be to maintain the same level of spending after retirement as the household had before retirement. There have been many extensions to the life cycle model, including some reviewed by Hanna, Fan, and Chang (1995), who noted that a 20 year old might not want to plan for as much consumption at age 80 as now, simply because the chance of being alive at age 80 might only be about 50 %. It may be rational for consumers to plan for somewhat lower consumption in retirement, especially in the later years of retirement. However, as Hanna and Kim (2014) suggested, in giving advice to households on saving, it may be prudent to assume no discounting of future consumption beyond that based on mortality risk.

There are many complexities to applying the life cycle model to analysis of the adequacy of retirement savings, but the standard approach is used by Engen, Gale and Uccello (2005, p. 39), who noted, "A household that is saving adequately is defined as one that is accumulating enough wealth to be able to smooth its marginal utility of consumption over time." The implications of this approach depend on various assumptions, but in general, a household should try to plan so that basic spending does not have to drop substantially after retirement.

Sources of Retirement Income in the USA

The standard way to categorize retirement income in the USA includes three pillars: Social Security, employment based plans such as Defined Benefit (DB) and Defined Contribution (DC) plans, and private saving. In addition, some people work past normal retirement age, or work part-time after retirement from a full-time job, and some households might have one partner retired and the other employed.

Social Security

Social Security is a mandatory social insurance system operated by the Social Security Administration, an agency of the federal government. It provides retirement, disability, and survivor benefits to almost all workers in the USA

except for state and local governments that opted out of the federal system. Under the Social Security pension system, a worker can start receiving benefits as early as age 62, although benefits are reduced by 5/9th of 1 % per month for each month before the "normal" retirement age benefits are started. For workers born in 1960 or later, starting benefits at age 62 rather than the normal retirement age of 67 will result in a one-third cut in monthly benefits. Delayed Retirement Credits beyond the normal retirement age until age 70 will result in an 8 % increase for each year.

Social Security is funded by a payroll tax that is regressive to the extent that there is a limit on the amount of wages that are subject to the tax. In 2015, a 6.2 % payroll tax was used to fund the retirement, disability, and survivor benefit system and applied to the first $118,500 of a worker's wage, though the Medicare program's 1.45 % tax was applied to an unlimited range of wages. Social Security benefits have a progressive structure, in that very low wage workers have a high percent of wages replaced by benefits upon retirement or in the case of death or disability, and high wage workers have low percent of wages replaced. For instance, a worker aged of 40 in 2015 who made a wage of $10,000 and retires at age 67 in 2042 would receive a Social Security pension replacing over 87 % of his wage, but one who had a wage of $120,000 would have only 28 % replaced by the Social Security pension (based on calculations on the Quick Calculator at SocialSecurity.gov.)

Social Security provides the most important source of income for most elderly households in the USA. In the aggregate in 2011, Social Security provided 36 % of the income of households age 65 and older, compared to 9 % from private pensions, 32 % from earnings, and 11 % from asset income (Social Security Administration, 2013). Butrica, Smith, and Iams (2012) estimated that for members of GenX (born 1966 to 1975) in the middle income quintile, Social Security would provide 37 % of total income at age 67, whereas for GenX members in the highest income quintile, Social Security would provide 9 % of total income. For those in the lowest income quintile, Social Security would provide 62 % of income at age 67.

Fears about the future of Social Security frequently are expressed in the popular press. If the US Congress does not make substantial changes in benefits and/or taxes, the combined Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund would be depleted by 2033, and income would be sufficient in the combined fund to pay only 77 % of scheduled benefits (Social Security Administration, 2014). However, even with such cuts, benefits in real terms for "medium wage" workers in 2045 might be similar to benefits in 2005 for medium wage workers. Because real wages would be much higher, the Social Security retirement benefit would replace a lower percent of final wages in 2045 than the same benefit replaced in 2005.

Defined Benefit Pensions

In the past, many employers offered defined benefit pensions (Costo, 2006), which are also referred to as formula pensions, because in many cases the level of benefits is determined by a formula involving the number of years worked and the average or final salary. Defined benefit pensions require no choices by the worker until retirement, and then may require only a few choices related to payouts, for instance, the choice of a joint payout for couples. The Pension Benefit Guarantee Corporation (PBGC) provides protection to most workers with defined benefit pension plans (U.S. Department of Labor, 2014a). Only 19 % of all workers with private employers in 2014 had access to a defined benefit pension plan, and only 8 % of workers of employers with fewer than 100 employees had access to such plans (U.S. Department of Labor, 2014b). Almost all (87 %) of government workers were eligible for an employer sponsored pension plan (Herz, Meisenheimer, & Weinstein, 2000). Butrica et al. (2012) estimated that for members of GenX (born 1966–1975) in the middle income quintile, defined benefit pensions would provide only 3 % of total income at age 67, compared to 19 % of income of the "War Babies" generation born 1936–1945, for 67 year olds in the middle income quintile.

Employer Sponsored Defined Contribution Plans

Many employers offer defined contribution retirement plans, including 401(k) accounts, which typically require a worker to make a number of choices, including how much to contribute and how the worker's contributions and any employer contributions will be invested (U.S. Department of Labor, 2014a). Of all workers with private employers in 2014, 56 % had access to a defined contribution pension plan, and 65 % of workers of employers with 100 or more employees had access to such plans (U. S. Department of Labor, 2014b). Butrica et al. (2012) projected that retirement accounts, including employer sponsored defined contribution plans and individual retirement accounts, would provide 15 % of total income for the GenX households in the middle income quintile at age 67. However, for 67-year-old GenX households in the top income quintile, retirement accounts provide a higher proportion of income than Social Security.

Household Savings, Including Individual Retirement Accounts

Most workers can contribute to an individual retirement account (IRA) and may be able to reduce their wages subject to federal income taxes by contributing to a traditional IRA. Many workers can make a non-deductible contribution to a Roth IRA, and there are other types of plans for individuals, such as the Simple IRA (Internal Revenue, 2006). For IRAs, investments grow with no income taxes imposed, but at retirement, all funds withdrawn from traditional IRAs are subject to federal income taxes, but no funds withdrawn from Roth IRAs are subject to federal income taxes. There are income limits for contributing to a Roth IRA. The optimal strategy for choosing a traditional IRA versus a Roth IRA depends on a number of factors, including the projected tax bracket in retirement versus now (Horan & Zaman, 2009). Some households also have investments outside of retirement accounts. Butrica et al. (2012) estimated that for members of GenX (born 1966–1975) in the middle income quintile, income from assets other than retirement accounts would provide 13 % of total income at age 67, whereas for GenX members in the highest income quintile, such income would provide 54 % of total income.

Wages

In 2011, earnings accounted for 32 % of the aggregate income of elderly households (Social Security Administration, 2013). Labor force participation decreases as people get older, with a 78 % participation rate for those age 50–54, a 55 % rate for age 60–64, a 32 % rate for age 65–69, and a 19 % rate for age 70–74 (U. S. Bureau of Labor Statistics, 2014). However, with rising life expectancies, the labor force participation rates for men and women have increased in the last 2 decades, leading to an increased importance of earnings as a source of retirement income for the elderly (Poterba, 2014). Butrica et al. (2012) estimated that for members of GenX in the middle income quintile, earnings would provide 24 % of total income at age 67.

Empirical Studies on Retirement Adequacy

Overview

Are American households on track to achieve an adequate retirement? There have been a number of studies that analyzed large, national datasets to project whether the resources that working households would have at retirement, including Social Security, defined benefit (DB) pensions, defined contribution (DC) pensions, and the income possible from accumulated assets, would provide a level of spending in retirement that would maintain the pre-retirement standard of living. There are a number of assumptions that

need to be made, including when retirement will take place, whether household members will still be employed after retirement, what level of spending is adequate and discount rate.

Table 3.2 summarizes selected studies of retirement adequacy. Yuh, Montalto, and Hanna (1998) found that 52 % of households in 1998 would have enough resources. Scholz et al. (2006) used a rigorous life cycle model and concluded that 80 % of households would achieve an optimal consumption level in retirement, and only a small proportion would fall substantially short of an optimal level.

From the New Beneficiary Survey (NBS), Haveman, Holden, Wolfe, and Sherlund (2006) found that about 60 % households would meet an earnings standard based on having at least 70 % of earnings, while half of new retirees have sufficient resources to enable the full maintenance of estimated pre-retirement consumption in retirement. Love, Smith, and McNair (2008) found about 82 % of households would have enough wealth to generate 1.5 times poverty-line income over their expected future lifetimes, and 87 % of households would experience replacement rates of at least 50 % of pre-retirement earning.

Hurd and Rohwedder (2012) performed simulations of consumption and wealth paths of a sample of 66–69 year olds by using data from the Health and Retirement Study (HRS) and data from the 2001–2007 Consumption and Activities Mail Survey (CAMS). They concluded that 71 % of persons in the target age group were adequately prepared for retirement, but there was substantial variation by observable characteristics, for instance, 80 % of married persons were adequately prepared compared with just 55 % of single persons.

Munnell, Webb, and Golub-Sass (2012) estimated the national retirement risk index defined as "at risk" of being unable to maintain their pre-retirement standard of living in retirement. They reported that only 47 % of American households are likely to be able to maintain their standard of living in retirement. The percentage of households with adequacy decreased by 9 percentage points between the 2007 and the 2010 SCF dataset. Kim, Hanna, and Chen (2014) found that the

Table 3.2 Selected retirement adequacy studies

Author	Adequacy proportion and brief summary	Dataset
Yuh et al. (1998)	52 % of households are on track to accumulate enough to maintain current predicted spending, assuming investment assets earn historical mean returns. However, based on pessimistic projection of investment returns, only 42 % are on track	1995 SCF
Scholz et al. (2006)	80 % of American households are well prepared for retirement, based on a life cycle model, and small proportions fall substantially short of what they need	1992–2004 HRS
Haveman et al. (2006)	Only about one-half of new retirees have sufficient resources in retirement, and about 60 % will have 70 % of earnings	1982 & 1991 NBS
Love et al. (2008)	About 82 % of households have more wealth than would be needed to generate 150 % of poverty-line income over their expected future lifetimes	1998–2006 HRS
Hurd and Rohwedder (2012)	About 70 % of individuals age 66–69 are adequately financially prepared for retirement. 80 % of married persons are adequately prepared compared with just 55 % of single persons	2001–2007 CAMS
Munnell et al. (2012)	47 % of American households will be likely to maintain their standard of living in retirement. The percentage of households with adequacy decreased by 9 percentage points between the 2007 and 2010 surveys	2010 SCF
Kim et al. (2014)	The proportion of households with retirement adequacy ranges from 44 % in 1995 to 58 % in 2007. Ignoring retirement income stages results in adequacy proportions being 23–28 percentage points higher	1995–2007 SCF

CAMS consumption and activities mail survey, *HRS* health and retirement study, *NBS* New Beneficiary Survey, *SCF* Survey of Consumer Finances

proportion of households with retirement adequacy ranges from 44 % in 1995 to 58 % in 2007, based on accounting for income stages during retirement. The retirement income stage was defined as a period in which the projected number of retirement income sources is constant. When they used the usual approach ignoring income stages, adequacy proportions were 23–28 percentage points higher.

There are many differences in the assumption made in these studies, so the projected range of adequacy rates, from 47 to 80 %, resulted partly from differing assumptions, as well as different datasets. Many experts believe that the absolute level of consumption for retiree households will tend to improve in the future, but whether the level relative to the pre-retirement consumption level will improve in the future depends on the model assumptions.

Projecting the Rate of Return on Investments

For households with substantial retirement investments, the assumptions made about the rate of return will have an impact on the estimate of retirement adequacy. Yuh et al. (1998) used the historical inflation-adjusted geometric mean returns for large stocks, 7.0 %, for all stock investments, the long-term corporate bond return, 2.2 %, for bond investments, the small stock return, 9.2 %, for business investments, and 6.5 % for real estate investments. Similarly, Kim et al. (2014) used the long-term inflation-adjusted mean and variance of each investment category at the time of the survey.

The HRS datasets do not provide as much detail as the SCF datasets about investments in mutual funds and retirement accounts. Scholz et al. (2006) assumed that portfolios had a return of 4 %. Love et al. (2008) did not state specific assumptions about investment returns, but used a real interest rate of 2.5 %. The assumptions made about rates of return do not seem sufficiently different to account for much of the differences in retirement adequacy estimates.

Consumption Needs during Retirement

Scholz et al. (2006) assumed that consumption needs vary according to a life cycle model. Given their assumptions about the utility function and rate of return on investments, optimal consumption would be much lower during retirement than before retirement, especially for households with children at home. Hurd and Rohwedder (2012) estimated the optimal consumption path based on simulations of rates of change in consumption observed by CAMS. Yuh et al. (1998) conducted regressions on spending in the Consumer Expenditure (CE) Survey and used the estimated parameters to predict spending for households in the Survey of Consumer Finances dataset. To determine the adequate level of retirement income, Kim et al. (2014) estimated the benchmark ratio of income replacement ratios by the published income categories using CE dataset. Love et al. (2008) estimated the minimum level of retirement wealth based on poverty thresholds, while Haveman et al. (2006) employed two pre-retirement living standards, a consumption replacement ratio (CRR) and an earning replacement ratio (ERR). Munnell et al. (2012) used 90 % of a target income replacement rate as a desired level of retirement income.

Personal Discount Rate

The studies listed in Table 3.2 used personal discount rates ranging from 1 % per year (Hurd & Rohwedder, 2012) to 4.5 % per year (Love et al., 2008). Most of the studies made arbitrary assertions of plausible personal discount rates. Hanna and Kim (2014) recommended that normative analyses for household financial decisions should justify assumptions about personal discount rate, and consider using a very low discount rate based only on the risk of death. The choice of a personal discount rate can have an enormous impact on the calculation of the amount of retirement savings needed. For example, using continuous discounting ($e^{-\rho t}$), a discount rate of

6 % per year implies that the utility of consumption today is valued 11 times as highly as the utility of consumption 40 years in the future, so that one might conclude that no retirement savings would be needed.

Conclusions

Roughly half of working households in the USA are not saving enough to be able to maintain their current spending after retirement. Scholz et al. (2006) obtained an estimate of 80 % of working households saving enough because of their assumption about the personal discount rate that implied much lower optimal spending in retirement than before retirement. If Scholz et al. are correct, a large majority of households are behaving rationally, and no theoretical explanation other than the extended life cycle savings model is needed to explain household retirement savings behavior. If the more pessimistic studies are correct, e.g., the National Retirement Risk Index released by Munnell et al. (2012), it is important to ascertain why people do not behave rationally and what can be done to improve the situation. Munnell, Rutledge, and Webb (2014) discussed the conflicting assessments, for example, Scholz et al. (2006) assumed that households would rationally plan for much lower levels of consumption in retirement. Munnell et al. (2014) concluded that optimistic assessments of retirement adequacy might be based on unrealistic assumptions.

Benartzi and Thaler (2013) suggested four strategies to improve retirement saving adequacy: (1) expanding accessibility to employment-based saving plans, (2) having automatic enrollment, (3) adopting appropriate default investment rules, and (4) establishing default escalation of the salary deferral rate. Auto-enrollment plans started increasing after the Pension Protection Act of 2006. Workers who can start investing for retirement 20–30 years before retirement should be able to accumulate enough assets for retirement, and given the outlook for Social Security providing lower replacement rates, investing early for retirement seems prudent.

Future research on retirement adequacy should include careful estimation of spending needs in retirement, as that has been the weakest part of all retirement adequacy studies. Research in the USA has been limited by not having surveys of households of all ages with both detailed spending information and detailed portfolio information. Hong (2015) presented a method for better estimation of current household spending in the US Survey of Consumer Finances based on data on financial obligations and food expenditures in the SCF, and using the Consumer Expenditure Survey to estimate other expenditures. Spending needs in retirement should be related to a household's current spending, for instance, and some studies assume the goal should be to have retirement spending as high as pre-retirement spending (e.g., Kim et al., 2014). However, regardless of the specific assumption, accurate estimation of each household's current spending is important.

Future research on retirement adequacy also should more carefully consider assumptions about investment accumulations. Typically, retirement adequacy studies using the SCF have assumed that each household maintains its current asset allocation between now and retirement, but the increasing popularity of target date funds (Mitchell & Utkus, 2012) means that many households will have a much more conservative portfolio in the last 10–20 years of retirement, and therefore a lower accumulation than would be calculated based on current allocations. Taking this pattern into account would lower mean projections of retirement assets. More research on pre-retirement withdrawals from retirement accounts would provide more accurate estimates of future retirement adequacy, by allowing for estimation of which households are more likely to withdraw funds before retirement. Normative portfolio studies should focus on more specific advice to workers saving for retirement as to optimal portfolio patterns for each level of risk aversion and for different levels of non-portfolio wealth. Additional insights might be possible using behavioral models and considering cognitive limitations of workers planning for retirement (Kim & Hanna, 2015).

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