

The Market for Retirement Financial Advice

EDITED BY

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Contents

<i>List of Figures</i>	ix
<i>List of Tables</i>	x
<i>List of Abbreviations</i>	xiii
<i>Notes on Contributors</i>	xv
1. The Market for Retirement Financial Advice: An Introduction <i>Olivia S. Mitchell and Kent Smetters</i>	1
Part I. What Do Financial Advisers Do?	
2. The Market for Financial Advisers <i>John A. Turner and Dana M. Muir</i>	13
3. Explaining Risk to Clients: An Advisory Perspective <i>Paula H. Hogan and Frederick H. Miller</i>	46
4. How Financial Advisers and Defined Contribution Plan Providers Educate Clients and Participants about Social Security <i>Mathew Greenwald, Andrew G. Biggs, and Lisa Schneider</i>	70
5. How Important is Asset Allocation to Americans' Financial Retirement Security? <i>Alicia H. Munnell, Natalia Orlova, and Anthony Webb</i>	89
6. The Evolution of Workplace Advice <i>Christopher L. Jones and Jason S. Scott</i>	107
7. The Role of Guidance in the Annuity Decision-Making Process <i>Kelli Hueler and Anna Rappaport</i>	125
Part II. Measuring Performance and Impact	
8. Evaluating the Impact of Financial Planners <i>Cathleen D. Zick and Robert N. Mayer</i>	153

viii Contents

9. Asking for Help: Survey and Experimental Evidence on Financial Advice and Behavior Change <i>Angela A. Hung and Joanne K. Yoong</i>	182
10. How to Make the Market for Financial Advice Work <i>Andreas Hackethal and Roman Inderst</i>	213
11. Financial Advice: Does It Make a Difference? <i>Michael Finke</i>	229
12. When, Why, and How Do Mutual Fund Investors Use Financial Advisers? <i>Sarah A. Holden</i>	249
Part III. Market and Regulatory Considerations	
13. Harmonizing the Regulation of Financial Advisers <i>Arthur B. Laby</i>	275
14. Regulating Financial Planners: Assessing the Current System and Some Alternatives <i>Jason Bromberg and Alicia P. Cackley</i>	305
<i>End Pages</i>	321
<i>Index</i>	325

Chapter 5

How Important is Asset Allocation to Americans' Financial Retirement Security?

Alicia H. Munnell, Natalia Orlova, and Anthony Webb

Financial advice—the topic of this volume—tends to focus on financial assets, applying tools that give prominence to the asset allocation decision. But most Americans have little financial wealth, and financial tools are often silent about the levers that will have a much more powerful effect on retirement security for such individuals. These levers include delaying retirement, tapping housing equity through a reverse mortgage, and controlling spending. Moreover, even for many with substantial assets, these non-financial levers may be as powerful as asset allocation in attaining retirement security.

Our analysis begins with a simple exercise that provides a stylized example of the tradeoff between investment returns and time spent in the labor force. The second section uses data from the Health and Retirement Study (HRS) on pre-retirees aged 51–64, to investigate how the gap between retirement needs and retirement resources is affected by working longer, taking out a reverse mortgage, controlling spending, and shifting funds to assets with no risk. Finally, we use a simple dynamic programming model to calculate a risk-adjusted measure of the value of moving from a typical conservative portfolio to an optimal portfolio for the average household.

We conclude that a focus on asset allocation alone is misplaced, since households have much more potent levers for achieving retirement security.

A simple model

It is useful to begin by estimating what percent of earnings individuals must save to ensure a financially secure retirement, depending on when they start saving, when they retire, and how they invest their retirement savings. Naturally, the age at which one begins to save and the age at which one retires are pivotal decisions in determining the required saving rate, and these can make the difference between a secure or insecure retirement.

90 The Market for Retirement Financial Advice

TABLE 5.1 Percent of pre-retirement salary required to maintain living standards, 2008

Pre-retirement earnings	Two-earner couples	Single workers
\$20,000	94	88
\$50,000	81	80
\$90,000	78	81

Source: Palmer (2008).

Our approach uses replacement rates—the ratio of retirement income to earnings before retirement—to gauge the extent to which older people can maintain their pre-retirement levels of consumption once they stop working.¹ People typically need less than their full pre-retirement earnings to maintain their standard of living once they stop working. First, they pay less tax: they no longer pay Social Security and Medicare payroll taxes, and they also pay lower federal income tax because—at most—only a portion of their Social Security benefits is taxable.² Second, they no longer need to save for retirement. And finally, most households pay off their mortgages before they retire, or soon thereafter.

The RETIRE Project at Georgia State University has been calculating required replacement rates for decades.³ As of 2008, the Project estimated that households with earnings of \$50,000 and over needed about 80 percent of pre-retirement earnings to maintain the same level of consumption (see Table 5.1). Households earning less required more to reach this adequacy goal because they generally save very little for retirement and pay much less tax while working.

How much individuals need to save in order to end up with an 80 percent replacement rate depends on a number of factors, including the household's earnings. The lower the earnings, the greater the portion provided by Social Security, so the individual would have to save less on his own. Also, the higher the rate of return on investments, the lower his required saving rate. The earlier the individual starts saving, the lower the required rate would be for any given retirement age, and the later the individual retires, the lower his required saving rate.

The Social Security Trustees (SSA, 2012) publish the percent of earnings that Social Security will replace at age 65 and at the eventual Full Retirement Age of 67 for low, medium, high, and maximum earners (see Table 5.2).⁴ Replacement rates for other ages from 62 to 70 have been calculated using the appropriate actuarial adjustment for early retirement or the delayed retirement credit for later retirement. Subtracting Social Security's replacement rate from 80 percent determines the percent of earnings that would need to be replaced by individual savings.

How Important is Asset Allocation? 91

TABLE 5.2 Current law Social Security replacement rates, 2030 and later (%)

Earnings level	Age	
	65	67
Low	49.0	55.3
Medium	36.3	41.0
High	30.1	34.0
Maximum	23.9	27.2

Source: SSA (2012: table V.C7).

A final issue is to determine how much income may be drawn from retirement savings. Our calculations assume the ‘4 percent rule,’ that is, an individual who retires at age 65 annually withdraws 4 percent of savings in that year. Those who retire earlier would withdraw somewhat less and those who retire later somewhat more.⁵ Another option would be to purchase an inflation-indexed annuity, which yields very similar results in terms of the required saving rate.

The implied saving rate depends on the assumed real return earned on accumulated assets, when the individual begins saving, and when the individual retires.⁶ In our model, we assume real rates of return from 1 to 7 percent; all individuals are assumed to be age 25 in 2010 and start saving at ages 25, 35, or 45, and retirement ages are assumed to range from 62 to 70.⁷ A wage growth assumption of 1.2 percent above inflation is used.⁸

To illustrate, we consider an individual aged 25 in 2010, who earns Social Security’s medium earnings of \$43,000 and retires at the Full Retirement Age of 67 in 2052. Under current law, Social Security will replace 41 percent of this individual’s final inflation-adjusted earnings of \$71,000; so the individual would need to save enough to replace 39 percent (80 percent minus 41 percent), or about \$27,700. With the 4 percent spending rule, the individual needs just under \$660,000 in 2052.⁹ If the individual started saving at 35 and earned a real return of 4 percent, he will need to save 18 percent of earnings each year.

Required saving rates for the medium earner, assuming a rate of return of 4 percent are presented in Table 5.3. Two messages emerge. First, starting to save at age 25, rather than age 45, cuts the required saving rate by about two-thirds. Second, delaying retirement from age 62 to age 70 also reduces the required saving rate by about two-thirds. As a result, the individual who starts at 25 and retires at 70 needs to save only 7 percent of earnings to achieve an 80 percent replacement rate at retirement, one-tenth of the rate for an individual who started at 45 and retires at 62—an impossible 65 percent.¹⁰ But note that even an individual who started

92 The Market for Retirement Financial Advice

TABLE 5.3 Saving rates required for a medium earner to attain an 80 percent replacement rate with a 4 percent rate of return (%)

Retire at	Start saving at		
	25	35	45
62	22	35	65
65	15	24	41
67	12	18	31
70	7	11	18

Source: Authors' calculations; see text.

TABLE 5.4 Saving rate required for a medium earner to attain an 80 percent replacement rate with a starting age for saving of 35, by rate of return (%)

Retire at	Real rate of return		
	2 percent	4 percent	6 percent
62	46	35	26
65	32	24	17
67	26	18	13
70	16	11	7

Source: Authors' calculations; see text.

saving at 45 has a plausible 18 percent required saving rate if he could postpone retirement to age 70.¹¹

Retiring later is an extremely powerful lever for several reasons. First, because Social Security monthly benefits are actuarially adjusted, they are more than 75 percent higher at age 70 than age 62. As a result, they replace a much larger share of pre-retirement earnings at later ages—29 percent at 62 and 52 percent at 70 in our example—thus reducing the amount required from savings. Second, by postponing retirement, people have additional years to contribute to their 401(k) and allow their balances to grow. Finally, a later retirement age means that people have fewer years to support themselves by drawing on their accumulated retirement assets. Accordingly, this approach highlights the impact of delayed retirement on the required saving rates.

Of course, these results depend on an assumed rate of return on assets of 4 percent. Table 5.4 shows the impact of lower and higher rates of return for individuals who start at age 35. A 2 percent return is slightly less than the long-run rate of return on intermediate-term government bonds and the 6 percent return is slightly less than the long-run rate of return on large capitalization stocks.¹² While higher returns do permit smaller

How Important is Asset Allocation? 93

contribution rates to reach the target, they also bring increased risk. Even ignoring risk, the required saving differentials are less than those associated with ages for starting to save and the age of retirement. In fact, an individual can offset the impact of a 2 percent return instead of a 6 percent return by retiring at age 67 instead of 62.

In summary, starting early and working longer can be more effective in boosting the chances of an adequate retirement than earning a higher return. This strategy of saving for a longer period of time is especially effective given the greater risk that comes from attempting to earn that higher return. Moreover, the further along people are in their careers, the more effective working a few years longer becomes. Next, we examine the effects of alternative strategies on actual households in the HRS.

Retirement income targets and resources

The HRS is a nationally representative panel of older American households; it began in 1992 by interviewing about 12,650 individuals from about 7,600 households ages 51–61 and their spouses (regardless of age), and it has been re-administered every two years since.¹³ Over time, other cohorts have been added to the survey, substantially increasing the sample size. War Babies (born between 1942 and 1947) were added in 1998; Early Boomers (born between 1948 and 1953) were added in 2004; and Mid Boomers (born between 1954 and 1959) were added in 2010. Like the original sample, these three additional cohorts are interviewed every two years.

Our sample focuses on households with a working head under age 65. All individuals who reported being single are defined as household heads; for couples, we identify the male as the head. In the case of same-sex couples, we define the higher-earning spouse as the head (or the older one if earnings were equivalent).

HRS households for whom complete data are available may be observed repeatedly until they reach age 64. As a result, the sample begins with 21,423 observations of households with heads under age 65 (in waves five to nine of the HRS, or 2000 to 2008). From that total, 7,203 observations were dropped because the household head was not working, and a further 1,604 observations were dropped because the data were incomplete or inconsistent. These deletions produced a final sample of 12,626 observations.¹⁴ Our sample is of somewhat higher socioeconomic status than the population as a whole, because working households tend to have more education and better health than those not working (Appendix Table 5.A1).¹⁵

Our goal is to create target replacement rates and projected replacement rates for each age from 60 to 70 for each household observation. Once constructed, the levers identified in the introduction can be applied to test

94 The Market for Retirement Financial Advice

their relative power in helping households achieve a secure retirement income.

Target replacement rates

We calculate a target replacement rate that would enable each household to maintain its current standard of living at each age from 60 to 70, covering both pre-retirement income and required mortgage payments. These targets come from the RETIRE Project and are discussed in the Appendix.

Projected retirement replacement rates

The next step is to project retirement replacement rates that each household will achieve if it continues its present course, maintaining its current saving rate and asset allocation, and not taking a reverse mortgage. Retirement income in our baseline scenario thus consists of Social Security benefits, employer pension payments, and income from financial assets. (Further details on the replacement rate calculations appear in the Appendix.)

Applying the levers

The difference between target replacement rates and projected replacement rates measures the extent to which household needs fall short of resources. This measure provides the baseline against which to assess the respective contributions of four possible interventions to bridge the gap. Such interventions might not be utility maximizing; that is, another strategy could be to accept lower consumption, both now and in retirement. Our objective, however, is not to identify an optimal strategy, but rather to calculate the effectiveness of each intervention in bridging the gap between post-retirement needs and resources.

Reverse mortgage income

Our first experiment has households take out reverse mortgages. These are calculated as follows: for homeowners without a mortgage, the household is assumed to take the maximum available loan, given the age of the younger spouse and the house value, and to exercise the lifetime income option. The proceeds from that option are based on January 2012 interest rates and typical closing costs and expenses. For homeowners with a mortgage, the household is assumed to use its financial assets to clear its mortgage debt at retirement. If financial assets are insufficient to clear the mortgage, the household then takes part of its reverse mortgage in the

How Important is Asset Allocation? 95

form of a lump sum, reducing the amount payable under the reverse mortgage lifetime income option. These reverse mortgage calculations produce a new set of projected retirement incomes for homeowners.

Delay retirement

The second experiment involves postponing retirement and the claiming of Social Security benefits. Postponing retirement gives the household the opportunity to make additional 401(k) contributions, earn additional returns on investments, and increase Social Security benefits, and it also reduces the period that accumulated assets must finance. Our baseline results provide information on the effect of later retirement on the gap, because they present targets and projected replacement rates for each age.

Asset allocation

Next we assume each household invests all of its assets in equities earning a 6.5 percent real return. We also assume no costs associated with the increased risk. Investing 100 percent in ‘riskless equities’ has an impact on both projected wealth at retirement and the amount that the household can consume during the course of retirement. Our notion is that if asset allocation did not dominate the other levers with ‘riskless equities,’ it would never dominate.

Control spending

Finally, we control spending, using the extra funds to increase savings. This intervention has two effects. First, the additional 401(k) contributions boost household retirement wealth and retirement income. Second, they reduce post-retirement needs by reducing the level of pre-retirement consumption that the household must maintain in retirement. For this exercise, the household increases its 401(k) contribution by five percentage points, which produces a commensurate decline in the replacement rate target.

Our results for each of the experiments appear in Table 5.5. In the base case, 74 percent of households are found to fall short of their targets at age 62. If households worked to age 67, Social Security’s ultimate Full Retirement Age, that share would drop to 45 percent. If households who own a home were to take out a reverse mortgage, the share falling short would reach 45 percent at age 65. If all households cut their spending by five percentage points—thereby increasing their saving and lowering their targets—the percent at risk would fall to 45 percent at age 66. If all households invested all of their assets in ‘riskless equities’ over their

96 The Market for Retirement Financial Advice

remaining work lives, they would reach the 45 percent figure six months earlier than the base case—at age 66.5. In other words, working six months longer—from 66.5 to 67—produces the same outcome as having all assets invested in ‘riskless equities.’ As shown in the following section, taking risk into consideration shifts the balance in favor of working longer. The fact that asset allocation has only a minor impact is not surprising, given that most households have little financial wealth (see Table 5.6).

A second set of results focuses just on the top decile of the wealth distribution, which includes households with over \$580,000 of financial wealth. Since these households are wealthier, a smaller percentage of households falls short at 62 even in the base case—39 percent for the

TABLE 5.5 Households falling short of target (%)

Lever	Age											
	60	61	62	63	64	65	66	67	68	69	70	
Full sample												
Base case	89.5	88.9	73.6	69.4	64.1	57.4	51.4	45.3	38.8	32.3	26.2	
Take out reverse mortgage	89.5	88.9	66.7	61.1	54.4	47.0	40.8	34.8	29.1	23.9	19.2	
Control spending	88.7	87.9	70.7	66.0	59.6	52.2	46.4	39.5	33.1	26.8	21.4	
Hold all ‘riskless equities’	89.2	88.4	72.7	68.3	62.6	55.5	49.3	42.8	36.3	29.7	23.8	
Top wealth decile												
Base case	56.3	54.3	38.5	34.4	29.5	23.5	19.1	16.3	12.4	10.4	7.8	
Take out reverse mortgage	56.3	54.3	37.0	31.6	25.1	19.8	16.8	13.8	9.9	7.8	5.7	
Control spending	54.2	52.0	35.8	30.5	24.7	19.6	16.8	12.8	10.3	7.9	5.6	
Hold all ‘riskless equities’	55.7	53.5	37.4	32.5	26.2	20.5	17.0	13.0	9.4	6.5	4.0	

Source: Authors’ estimates; see text.

TABLE 5.6 Wealth levels by wealth deciles (\$ 2011)

Wealth decile	Financial wealth	
	Minimum	Maximum
1	0	418
2	438	4,168
3	4,179	14,369
4	14,369	33,642
5	33,654	63,393
6	63,438	108,692
7	108,796	176,346
8	176,534	312,415
9	312,589	579,013
10	579,912	–

Source: Authors’ tabulations from the HRS.

How Important is Asset Allocation? 97

top decile, versus 74 percent for the population as a whole (see Table 5.5). If top-decile households worked to 67, the share falling short drops to 16 percent. If these households took out a reverse mortgage, the 16 percent threshold would be reached at age 66. The relative impact of a reverse mortgage is smaller for the wealthy, because their homes are a much smaller component of total wealth. If households controlled their spending, the fraction at risk would fall to 16 percent at age 66. Finally, investing all assets in ‘riskless equities’ allows the top decile to reach the 16 percent threshold at 66. So, even for the top decile, asset allocation is no more powerful than the other levers.

Dynamic modeling

Our final exercise uses dynamic programming techniques to calculate a risk-adjusted measure of the potential gain from portfolio rebalancing. In contrast to the two previous approaches, this approach enables us to calculate an optimal savings rate and portfolio allocation, and to calculate the benefit to the household of adopting an optimal portfolio allocation taking into account changes in the riskiness of that portfolio. The analysis focuses first on the typical household approaching retirement, and next on a household typical of those in the top financial wealth decile.

In our data, the typical household is aged 57, has a household income of \$62,600, and financial wealth of \$60,500. The household’s portfolio is held in tax-deferred accounts, and the portfolio allocation is 36 percent in stocks, 16 percent in bonds, and 50 percent in cash.¹⁶ The assumption is that stock returns are independent and identically distributed (i.i.d.) with a mean of 6.5 percent and a standard deviation of 20 percent, the average for the period 1926–2010. Bonds and short-term deposits are both assumed to be risk-free, with real returns of 3 and 1 percent, respectively.¹⁷

Following Scholz et al. (2006), earnings are assumed to follow an autoregressive process of order one (AR(1)).¹⁸ The retirement age is 66, and the household’s 401(k) deferral is 9 percent of salary. The household is posited to receive Social Security benefits of \$20,800 a year, the median for this birth cohort.¹⁹ Earnings before retirement are subject to federal income and payroll taxes, and withdrawals from tax-deferred accounts and Social Security benefits are subject to federal income taxation after retirement. Prior to retirement, the household’s consumption equals labor market earnings minus taxes and 401(k) deferrals.

To calculate an optimal decumulation of financial assets in retirement from the typical portfolio allocation described above, the household is assumed to have a constant relative risk aversion utility function over consumption in excess of the federal poverty guideline. The household

98 The Market for Retirement Financial Advice

has a coefficient of relative risk aversion (CRRA) of five or two, and population average mortality for the 1950 birth cohort.²⁰ The rate of time preference is assumed to be 3 percent. We also have the household switch from the typical portfolio described above to an optimal portfolio, which varies with age. The goal is to calculate the dollar amount by which the wealth of the household retaining the typical portfolio must be increased, so that the household is as well off in expected utility terms as when it adopts the optimal allocation. Finally, we have the household switch from the typical portfolio to one invested entirely in stocks. We then calculate the dollar amount, if any, by which the current wealth of a household retaining the typical portfolio must be increased, so that it is as well off in expected utility terms as when it switches to a portfolio invested exclusively in stocks. This represents the value or cost to the household of switching to the all-stock portfolio analyzed in the preceding pages.

Results for the hypothetical household at two levels of risk aversion are reported in the upper panel of Table 5.7. One piece of information that helps provide some intuition behind the findings is that a large portion of the total wealth of the typical household is the present discounted value of future Social Security benefits. Since Social Security wealth is a bond-like asset, the optimal allocation for these households involves a large share of financial wealth invested in equities under the assumption of CRRA utility (see Table 5.8).

Assuming a CRRA of five, the amount required to compensate the household for retaining a typical portfolio (where 36 percent of assets are invested in equities), rather than switching to an optimal portfolio allocation (where 51 percent of assets are invested in equities) is \$5,800, or approximately the amount the household would earn if it delayed retirement by one month. In contrast, when the comparison is between a typical

TABLE 5.7 Amount required as compensation for retaining typical portfolio allocation (\$ 2011)

Household type and risk aversion	Retaining typical portfolio rather than switching to optimal portfolio	Retaining typical portfolio rather than switching to all-stock portfolio
Typical wealth household		
CRRA = 5	\$5,800	–\$3,800
CRRA = 2	26,800	26,800
Top wealth decile household		
CRRA = 5	\$91,000	–\$316,000
CRRA = 2	21,000	–11,600

Note: CRRA = constant relative risk aversion utility function.

Source: Authors' calculations.

How Important is Asset Allocation? 99

TABLE 5.8 Typical and optimal portfolio allocations (%)

Household type and risk aversion	
Typical household	
Typical stock allocation	36
Optimal stock allocation—CRRA = 5	51%
Optimal stock allocation—CRRA = 2	100%
Top-decile household	
Typical stock allocation	57
Optimal stock allocation—CRRA = 5	29%
Optimal stock allocation—CRRA = 2	70%

Note: Optimal stock allocations are calculated as of age 65. CRRA = constant relative risk aversion utility function. The typical portfolio allocation is calculated over all households with non-zero financial wealth.

Source: Authors' calculations.

portfolio and an all-stock portfolio, the household is better off by approximately \$3,800 if it retains the typical portfolio, or less than one month's salary. That is, an all-stock portfolio is even more sub-optimal than the typical conservative portfolio. In any event, however, the dollar amounts are small, implying that asset allocation is relatively unimportant for the typical risk-averse household.

Even if the household were less risk averse (CRRA of two), the story is similar. In this case, as shown in Table 5.8, the optimal portfolio would be all in stocks. The cost of retaining a typical portfolio (57 percent in equities), rather than switching to an optimal portfolio (all equities), is \$26,800 or just over four months' salary. As the optimal portfolio in this model is 100 percent in equities, the cost of retaining a typical portfolio relative to an all-stock portfolio is also \$26,800. In short, regardless of the degree of risk aversion, asset allocation has a relatively small impact on the typical household.

The lower panel of Table 5.7 reports results for the wealthy household in the top decile of financial wealth. This household has income of \$137,800 and financial assets of \$889,000: 57 percent in stocks, 22 percent in bonds, and 21 percent in short-term deposits. Because Social Security wealth is a much smaller share of this household's wealth, optimal equity holdings are lower than for the typical household (Table 5.8). If the household had a CRRA of five, the cost of retaining a typical portfolio (57 percent in equities), rather than switching to an optimal portfolio (29 percent in equities), is \$91,000. Again, as above, the top-decile household is *better off* retaining a typical portfolio rather than switching to an all-stock portfolio; the benefit is \$316,000. The comparable amounts for a household with a CRRA of two are a cost of \$21,000 and a benefit of \$11,600. Although the

100 The Market for Retirement Financial Advice

amounts required as compensation are larger for the top-decile household than for the typical household, they are still small relative to working longer.

Conclusion

Financial planners frequently highlight the asset allocation decision, suggesting that individuals may gain substantially from a different allocation of stocks and bonds. Yet they are often silent on the benefits of other behaviors such as delaying retirement, controlling spending, or taking out a reverse mortgage. We show that the typical 401(k)/IRA balances of households approaching retirement are below \$100,000, suggesting that the net benefits of portfolio reallocation for typical households would be modest, compared to other levers. Higher income households may have slightly more to gain.

In view of the relative unimportance of asset allocations for most Americans, financial advisers would likely be of greater help to their clients if they focused on a broad array of tools—including working longer, controlling spending, and taking out a reverse mortgage.

Appendix

This appendix explains the calculation of components of the replacement rate.

Target replacement rates

Georgia State University's RETIRE Project provides four sets of retirement income replacement rates that vary by marital status, age, and labor force participation status. Each set of replacement rates is for incomes of \$20,000 to \$90,000 in increments of \$10,000. HRS households were assigned target replacement rates based on these factors. The assumption was that households were aiming to replace the relevant percentage of the average of the last ten years' earnings.²¹

The RETIRE report does not explicitly model mortgage debt, so the targets need to be adjusted to reflect our projection that a significant proportion of the sample will have either repaid their mortgage by retirement or be able to repay all or part of the balance outstanding at that time by drawing on financial assets. The adjustment involved subtracting annual mortgage payments reported by respondents from their target retirement incomes, and then adding annual mortgage payments multiplied by the

How Important is Asset Allocation? 101

ratio of remaining mortgage debt (mortgage debt less financial assets) to initial debt at retirement. The adjusted targets were calculated for each household observation for ages 60 through 70.

Projected retirement replacement rates

Social Security. Projected Social Security benefits are calculated using the HRS Social Security earnings records, available to qualified researchers on a restricted basis. When the Social Security earnings records are not available, earnings histories were imputed using current earnings, earnings at the first HRS interview, and final earnings in previous jobs.²² Wages between the age the household is observed and the retirement age are projected using Social Security's Average Wage Index (AWI; SSA 2011). The entire wage history is then indexed by the AWI, and the highest 35 years of indexed wages are used to calculate the Average Indexed Monthly Earnings (AIME). The benefit formula is then applied to the AIME to derive the individual's Primary Insurance Amount.

Pension income. Pension income is based on the 1998 and 2004 HRS imputed data for employer-sponsored pension plan wealth in current jobs.²³ Households in waves seven through nine (2004, 2006, and 2008) were assigned pensions from the 2004 data set; households in waves five and six (2000 and 2002) from the 1998 data. The data sets differ slightly. The 2004 data set includes values for retirement ages 60, 62, 65, and 70. For the 1998 data set, pension values were available only for ages 60, 62, and 65. The 2004 data set discounts defined benefit pension wealth to the survey year, while the 1998 data set projects defined benefit wealth to the retirement age. The 1998 values are extrapolated to age 70 based on the average increase in retirement wealth from 65 to 70 in the 2004 data. For both data sets, values for ages 63, 64, and 66 through 69 are interpolated based on the reported numbers.

Defined benefit pension wealth is converted into pension income using the interest and inflation rate assumptions embedded in the pension wealth calculations.²⁴ In the case of defined contribution pension wealth, the starting point is the account balance. Balances then grow as participants contribute 6 percent of salary, receive a 50 percent employer match, and earn a 4.6 percent real return until retirement. The contributions are based on the assumption that the salary rises by 1.2 percent a year. People who started their jobs after 1998 (waves five and six) or 2004 (waves seven, eight, and nine) are assumed to receive no pension benefits on their new job. The conversion of defined contribution wealth to income is discussed in the next section on financial assets.

102 The Market for Retirement Financial Advice

TABLE 5.A1 Comparison of workers with all HRS households under age 65

	Working (our sample)	All
Age	56.9***	57.4
Married couple	0.644***	0.605
Ethnicity		
Black	0.098***	0.120
Hispanic	0.078***	0.085
Education		
Less than high school	0.094***	0.143
Some college	0.602***	0.542
Homeowner	0.838***	0.796
Median house value (homeowners only)	\$189,000***	\$179,000
Has mortgage	0.546***	0.468
Median mortgage balance (households with mortgages only)	\$93,800***	\$89,300
Pension		
DB or both	0.286***	0.096
DC	0.277***	0.134
Earnings		
Median	\$65,400***	\$38,000
75th percentile	\$108,500***	\$81,000
Financial assets		
Median	\$63,400***	\$35,700
75th percentile	\$233,200***	\$181,800
Sample size	12,626	21,423

Notes: HRS sample weights. *** denotes that the values are significantly different at the 1 percent level, adjusted for household level clustering.

Source: Authors' tabulations from the HRS.

Financial assets. Household financial wealth invested in stocks, bonds, and short-term deposits is assumed to earn returns of 6.5, 3, and 1 percent, respectively, from the date of the interview until retirement. These rates approximate the long-run average rates of return on each of the three asset classes. Importantly, these assumptions are used throughout for projecting asset returns rather than incorporating any actual fluctuations. The objective is to assess whether households are on track to meet their replacement rate targets, not whether they actually succeeded in meeting them.

At retirement, the household is assumed to purchase a nominal joint or single life annuity with all its financial assets, including 401(k) and IRA balances. Currently, annuity rates are extremely low, reflecting depressed interest rates. The objective of this exercise is to calculate financial preparedness for retirement, given the beliefs of respondents at the date of the HRS interviews. Therefore, the assumed annuity rates are based on a 5.1 percent ten-year Treasury Bond interest rate, projected mortality improvements based on Social Security Administration cohort mortality tables, and

How Important is Asset Allocation? 103

current expense loads.²⁵ At this point, target and projected replacement rates are available for each household observation for ages 60 through 70.

Endnotes

1. Technically, economists posit that individuals are interested in smoothing marginal utility, not consumption. If additional leisure enables the household to attain the same marginal utility at lower levels of consumption, it may be optimal to accept lower consumption after retirement. This is one explanation for what the literature calls the ‘retirement-consumption puzzle’—namely, the fact that consumption appears to drop as people retire. See Banks et al. (1998); Bernheim et al. (2001); and Hurd and Rohwedder (2003). We abstract from this approach in the present chapter.
2. The taxation treatment of Social Security benefits is as follows. First, the household calculates its ‘combined income.’ Combined income is regular taxable income plus 50 percent of Social Security benefits. The taxable amount of Social Security benefits is the minimum of three tests: (a) 50 percent of combined income over the first threshold (\$25,000 for singles and \$32,000 for married couples) plus 35 percent of combined income over the second threshold (\$34,000 for singles and \$44,000 for married couples); (b) 50 percent of benefits plus 85 percent of combined income over the second threshold; or (c) 85 percent of benefits (Internal Revenue Service, 2012).
3. For an array of pre-retirement earnings levels, they calculate federal, state, and local income taxes and Social Security taxes before and after retirement. They also use the Bureau of Labor Statistics’ Consumer Expenditure Survey to estimate consumer savings and expenditures for different earnings levels (Palmer, 2008).
4. The low earner has career average earnings equal to about 45 percent of the national Average Wage Index (AWI). The medium earner has career average earnings equal to about 100 percent of the AWI. The high earner has career average earnings equal to about 160 percent of the AWI. The AWI in 2010 was \$43,084 and maximum taxable earnings were \$106,800. Thus, the low-wage worker would earn \$19,388 and the high-wage worker would earn \$68,934. For a further discussion of the AWI, see Mitchell and Phillips (2008) and Munnell and Soto (2005).
5. Bengen (1994) showed that households adopting this strategy and who invest in a mixed stock-bond portfolio face a relatively low risk of outliving their wealth. Although sub-optimal, we assume that the appropriate percentage drawdown rate is not affected by realized returns during the accumulation phase (i.e., that realized returns do not provide information about the distribution of prospective returns).

104 The Market for Retirement Financial Advice

6. As most saving in the United States is done through employer-sponsored plans—primarily 401(k)s—the required saving rate should be viewed as the combined employer–employee contribution rate.
7. The calculation abstracts from investment risk; in reality, an expected 7 percent real return can only be earned at the cost of assuming very considerable risk. It also abstracts from the notion of optimal saving. Indeed, for households that are middle-aged and have yet to start saving for retirement, the optimal strategy will likely be not only to delay retirement but also to cut post-retirement consumption targets (Kotlikoff, 2008).
8. This assumption is used by the Social Security Trustees (SSA, 2011) for the economy as a whole. Individual workers may experience more rapid increases as they gain seniority in jobs. More rapid wage growth will increase the required saving rate, all else equal.
9. Under current law, benefits will be cut when the Social Security Trust Fund is exhausted.
10. A more sophisticated analysis would adjust the target replacement rate. That is, if an individual was indeed saving 65 percent of earnings, he would be living on 35 percent. The 80-percent target would no longer be appropriate.
11. These results are similar to those reported by Mitchell and Moore (1998).
12. Data from Ibbotson (2010) show that, over the period 1926–2010, real stock returns have averaged 6.5 percent and the real return on the ten-year Treasury was 2.4 percent.
13. The HRS is conducted by the Institute for Social Research (ISR) at the University of Michigan and is made possible by funding from the National Institute on Aging. More information is available at the ISR website: <http://hrsonline.isr.umich.edu/>.
14. The primary reason for dropping observations was that the head reported working but had zero earnings. We retained the observation if the head reported that he was in the same job as in the previous wave and reported non-zero earnings in the previous wave.
15. Wealth levels are similar to those reported by Moore and Mitchell (2000), after making allowance for inflation.
16. Introducing both taxable and tax-deferred accounts and allowing households to choose the order in which the household draws on these accounts would greatly complicate the model without yielding additional insight.
17. In a single-period model, both stocks and bonds carry risk. Campbell and Viceira (2002) argue that over a long time horizon, bonds and, in particular, Treasury Inflation Protected Securities are the true risk-free asset, because they guarantee a return on capital. If a long-term investor knew his consumption requirements with certainty, he could fund them by buying a portfolio of bonds of appropriate maturities. We therefore assume that corporate bonds yield a fixed real 3 percent return. Our assumed real rate of return is considerably in

How Important is Asset Allocation? 105

- excess of the current negative real interest rates, reflecting an assumption that short-term interest rates will eventually revert to more normal levels.
18. An alternative would be to assume that the household experiences both permanent and transitory wage shocks (as in Chai et al., 2011).
 19. Given our assumption of labor income uncertainty, the household also faces some level of uncertainty as to Social Security benefit levels.
 20. Estimated coefficients of risk aversion in the academic literature range between two and ten, depending in part on whether the estimates are derived from portfolio theory, purchases of insurance, economic experiments, or preferences over lotteries (Chetty, 2003).
 21. The ten-year period refers to the decade before the observation, not the ten years prior to retirement.
 22. When the Social Security earnings records are not available, the procedure followed Gustman and Steinmeier (2001) and estimated earnings histories based on HRS data on previous jobs and wages, using the estimated returns to tenure from Anderson et al. (1999).
 23. Participants in the HRS are asked about projected benefits from employer pensions. The HRS also obtains pension plan data from participants' employers. Also, the HRS pension data collected from participants suffers from high levels of non-response and misreporting of pension type. We considered using data that the HRS has collected from respondents' employers, but these data are only available for about two-thirds of participants.
 24. The interest rate assumption is irrelevant, provided that the same assumption is used to calculate pension wealth from respondents' estimates of their pension income, and then to recover pension income from pension wealth.
 25. To simplify the calculations, the spouse is assumed to be the same age as the head of the household.

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