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ABSTRACT

How households draw down the balances that they accumulate in retirement saving accounts such as 401(k) plans and Individual Retirement Accounts can have an important effect on the contribution of these accounts to retirement income security. This paper presents evidence on the pattern of withdrawals at different ages. We find a relatively modest rate of withdrawals prior to the age at which households are required to take minimum required distributions. Only seven percent of PRA-owning households between the ages of 60 and 69 take annual distributions of more than ten percent of their PRA balance, and only 18 percent of PRA households in this age group make any withdrawals in a typical year. The rate of distributions rises sharply after age 70 ½, when minimum distributions are required. The proportion of PRA-owning households making a withdrawal jumps to over 60 percent by age 71, and crosses 70 percent a few years later. On average, households age 60 to 69 with PRA accounts withdraw only about two percent of their account balances each year, considerably less than the rate of return on account balances during our sample period. Even at older ages—after the required minimum distribution age--the percentage of balances withdrawn remains at about five percent.

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Just three decades ago retirement saving in the United States was based heavily on employer-provided defined benefit plans. Benefits after retirement were typically received in the form of lifetime annuities. Today, personal retirement accounts (PRAs), which include 401(k)s, IRAs, Keoghs, and similar plans, have become the primary form of retirement saving for private-sector workers. The Investment Company Institute (2012) reports that in 2011, PRA assets totaled $9.4 trillion while assets in private sector traditional defined benefit programs totaled $2.3 trillion. At the time of retirement, the PRA participant typically has sole control of accumulated assets and can decide when to withdraw them.

To date, assets held in PRAs have rarely been annuitized. Through age 70½ withdrawals are at the discretion of the account owner. After that age, minimum distributions are required. A long-standing concern with self-directed PRAs has been that some participants may draw down assets precipitously in their early retirement years, and then outlive their retirement assets. These concerns have motivated a number of recent proposals, such as Gale, Iwry, John and Walker (2008) and Iwry and Turner (2009), to encourage the annuitization of PRA assets. The U.S. Department of Labor and the U.S. Treasury jointly held public hearings in 2010 on "lifetime income options for retirement plans" to assess the feasibility of annuitization proposals and the U. S. Treasury (2012) has recently released guidance to encourage partial annuity options. The concern about early withdrawal is heightened by the growing importance of rollovers from corporate pension plans in the contribution flow to PRAs, which gives individuals control over the draw-down pattern for a larger share of their retirement assets than ever before.

If proposals to encourage or require annuitization were adopted, older households would have higher levels of annuity income, but lower levels of PRA balances. Whether most households would benefit from the substitution of higher annuities for lower asset balances is an open question. Yaari (1965) famously showed that households that face only longevity risk should desire to fully annuitize. However, the optimal annuitization strategy is much more complex when households face other sources of risk such as the possibility of large uncertain medical expenses for which they may want to maintain a cushion of financial assets.

The pattern of withdrawals from PRAs not only affects the likelihood that PRA holders will outlive their resources, but also federal tax revenues. Contributions to PRAs are tax-deductible in most cases, and the interest payments, dividends, and capital gains that accrue on assets held in PRAs are not taxed. Both the principal and the accumulated income are taxed as ordinary income when households withdraw funds from their PRAs. Required minimum distributions (RMDs), which must begin in the year after the PRA holder reaches the age of 70 1/2, reduce the present discounted value of the federal income tax cost associated with PRAs. RMDs prevent the indefinite accumulation of assets within the PRA system. There have been some proposals, such as pension reform bill introduced by Representatives Portman and Cardin in 2003 that was discussed by Orszag and Greenstein (2003), to raise the age at which RMDs begin from 70 1/2 to 75. The Joint Committee on Taxation (2003)

estimated that raising the RMD age from 70 1/2 to 75 would have reduced federal income tax revenues by $3.94 billion in 2012. The extent to which such a change would affect federal revenues depends critically on the extent to which current RMD requirements serve as a binding constraint on PRA owners - an issue that patterns of withdrawals can inform.

A third motivation for this study is found in recent work on the role of private saving, both inside and outside PRAs, in supplementing Social Security income. Shoven and Slavov (2012) suggest that most Social Security beneficiaries would benefit substantially by delaying the age at which they claim Social Security benefits, because that would increase the present discounted value of their Social Security income. They also suggest that households consider drawing down personal financial assets, first those outside a PRA and then those in a PRA, as a strategy for financing consumption spending between retirement and date at which they begin to receive Social Security benefits. Since Poterba, Venti, and Wise (2011a) report that nearly half of households reaching retirement age now have some PRA assets, these assets could support at least some delay of claiming decisions. Even without examining the PRA drawdown data, however, it seems that relatively few households are pursuing this strategy, since delayed-claiming of Social Security benefits is uncommon.

Because PRAs did not attract substantial assets from a broad segment of the U.S. population until the early 1980s, those who reached retirement age in the 1980s and 1990s with any PRA assets typically had relatively small balances. Their PRA accumulation was often supplementary to income from other retirement plans. It is only in the last decade that sizable numbers of households have begun to reach retirement age with substantial PRA balances, thereby making it possible to investigate the dynamics of post-retirement account management. In this paper, we present new evidence on the experience to date with the draw-down of PRA assets. We find that households typically conserve PRA assets well into old age. We also find that the rate at which assets are withdrawn from PRAs rises substantially when the household head reaches the age at which required minimum distributions must begin.

A great deal of previous research has documented the pre-retirement build-up of PRA assets. Poterba, Venti, and Wise (2007), for example, tracked the shift from defined benefit to defined contribution plans over the last two decades, and developed projections -- assuming average rates of return and the continuation of past contribution patterns -- of future PRA balances. Brady, Holden, and Short (2009) provide detailed information on the current distribution of PRA assets between IRAs and various defined contribution plans, and they place these holdings in perspective relative to private and public defined benefit plans. In this analysis, we take the level of PRA assets at retirement as given, and focus on the relationship between the post-retirement drawdown of these assets and various household characteristics.

Our exploration of the draw-down patterns from PRAs parallels earlier investigations of the late-life draw-down of housing equity. Venti and Wise (1990, 2001, 2004) found that home equity was typically not used to support general

consumption in retirement, but instead drawn down in the event of shocks to family status, like death of a spouse, or entry into a nursing home. They concluded that home equity, the primary asset of a large fraction of families, was "saved for a rainy day." Megbolugbe, Sa-Aadu, and Shilling (1997), Banks, Blundell, Oldfield and Smith (2010) and Banerjee (2012) also find that much of the drawdown of home equity typically occurs in the aftermath of household shocks. Davidoff (2010) suggests that conserving housing equity can preserve flexibility to fund potentially large health expenses.

Like housing equity,, PRA assets are an important component of the wealth of many households. For example, Poterba, Venti, and Wise (2011a) report that in 2008, the total value of PRAs assets was slightly greater than the total value of other financial assets for households headed by someone between the ages of 65 and 69. In this paper, we investigate whether households treat PRA assets like housing equity, and conserve them. Since PRA assets accumulate tax-free, households with other assets outside a PRA that can be used to fund retirement have an additional motivation to hold the PRA assets until they must be withdrawn for health care or other family shocks late in life. We give special attention to health because medical expenses can be one of the largest uncertain expenditures in late life. Of course, in studying the relationship between household health and PRA drawdown, we must recognize that PRA balances are related to health status. Households that have experienced chronic health limitations are less likely to reach retirement with substantial PRA balances, both because their employment history may have made it more difficult to contribute to PRAs, and because their health needs may have induced pre-retirement withdrawals from these accounts.

Our analysis begins with a description of the ownership of PRA assets. We then consider PRA balances, withdrawals, and the proportion of balances withdrawn. In each case we estimate age and cohort effects and include as covariates a series of household attributes such as retirement status, marital status, income, wealth, and health status. We anticipate that the drawdown of PRA assets will vary as a function of income sources in retirement, non-PRA wealth, and health status. We know from other analyses, including Wu (2003), Smith (2005), Lee and Kim (2008), Coile and Milligan (2010), and Poterba, Venti and Wise (2012), that health is a very strong determinant of the drawdown of non-annuity assets. Our analysis relies primarily on data from the Survey of Income and Program Participation (SIPP), but also draws on information in the Health and Retirement Study (HRS).

Our central finding is that PRA assets tend to be conserved in the early retirement years. Withdrawal rates are low following retirement until account-holders attain age 70½ and must begin RMDs. At that age, the proportion of households reporting withdrawals jumps from about 20 percent to over 60 percent. The overall proportion of assets withdrawn averages between one and two percent between ages 60 and 69, and rises to about five percent at age 70 ½. It fluctuates around that level through age 85. In our sample, investment returns and contributions to PRAs from the subset of older households who are still employed exceed this withdrawal rate, so average PRA assets to rise with age even after age 70 ½. This pattern could be

different if we were studying a period of protracted decline in asset prices. These findings suggest that while there is substantial heterogeneity across households, a relatively small share of households draw down PRA assets precipitously either before or after age 70 1/2.

Our analysis complements a number of other recent analyses of the post-retirement utilization of PRAs that were based on other data sources. For example, Bryant, Holden, and Sabelhaus (2010) use tax return data to study withdrawals from IRAs and defined contribution pension plans before plan beneficiaries reach age 60. They find such distributions equal roughly 2.5 percent of underlying assets in recent years. Bershadker and Smith (2006) examine withdrawals from IRAs using tax returns for 2002. They find that nearly half of taxpayers do not make any IRA withdrawals within the first two years of retirement, and that a substantial group of IRA holders waits until age 70 ½ before making any withdrawals. Love and Smith (2007) compare balances in IRAs and defined contribution retirement plans for households in several waves of the HRS, and they find that the annuitized value of wealth rises from one wave to the next for most households. That is consistent with our observation that investment returns plus PRA contributions from households who are still working exceed withdrawals until advanced ages. Love, Palumbo, and Smith (2008) present similar calculations for broader wealth aggregates.

Other studies have addressed the evolution of total wealth profiles. Hurd (2002) studies a sample of households in the Asset and Health Dynamics among the Oldest Old (AHEAD) survey, and finds that total wealth declines with age when computed from a cross-section, but increases when computed from a panel. His study also calculates profiles for individual categories of assets and finds that the pattern of positive wave-to-wave changes holds for most asset categories including IRAs. French, Doctor, and Baker (2007), using the AHEAD survey, find a modest decline in household wealth over the 1996-2004 period. A recent study by Hurd and Rohwedder (2010) calculates several different measures of wealth and saving and finds evidence that total wealth declines with age for singles, but not for couples. None of these studies separately distinguished wealth held in all PRAs from wealth held in other forms. Poterba, Venti, and Wise (2011b) suggest that wealth trajectories vary substantially across older households, with family status transitions playing a particularly important role in distinguishing those with rising and stable or declining wealth.

Our paper is divided into six sections. In the first, we describe the growth of PRAs by tracking various age cohorts and we emphasize the strong relationship between individual attributes—earnings, non-PRA wealth, health status, and other attributes—and the probability of having a PRA. In section two, we describe the evolution of within-cohort PRA balances as each cohort ages. We find that assets increase with age even after retirement. We also report the relationship between PRA assets and household attributes such as marital status, income, assets and health. We then consider the withdrawal of PRA assets in more detail. Section three explores the relationship between household attributes and the probability that a household with a PRA makes a withdrawal from the account. Section four presents evidence on the

percent of the PRA balance that is withdrawn, conditional on a withdrawal. The fifth section reports summary information on the proportion of households that withdraw more than a given percent of their PRA balance in a given year. This offers evidence on the proportion of households that are drawing down their PRA assets rapidly. There is a brief conclusion.

1. SIPP Data for Tracking PRA Ownership

We describe the spread of PRA accounts using SIPP data organized by cohort. The SIPP data are available for the years 1997, 1998, 1999, 2001, 2002, 2004, 2005, 2009 and 2010.[1] We define PRA assets as the sum of the responses to the three SIPP questions that ask about holdings of "IRAs", "Keoghs" and "401(k), 403(b) or thrift plans." Summary data on the number of observations, PRA participation rates and PRA assets, by age and by year are presented in Table 1-1. In this table the "age" of married households is assumed to be the age of the husband. For consistency with our subsequent tables, in which we consider withdrawals from PRA plans in the twelve months after the balance is reported, Table 1-1 only includes households who remained in the sample for at least twelve months after the PRA balance was reported.[2]

Simple comparisons of the findings from various waves of the SIPP show that both the likelihood of respondents having assets in a PRA, and the mean PRA balance in 2010 dollars increase over time. Because we do not analyze data from 2007, the year when equity markets reached their recent valuation peak, we do not observe account balance declines between 2007 and 2009 or 2010. We observe a slight decline in the probability of having a PRA for those in the C50-59 cohort between 2005 and 2010, but increases in both ownership probability and account balance conditional on ownership of a PRA. In each wave of the survey, both the probability of PRA ownership and the average PRA balance conditional on ownership decline with age.

For tracking the evolution of PRA participation and for analyzing how account balances vary for PRA participants as they age, it is helpful to organize the SIPP data

[1] The 1997, 1998 and 1999 data are from waves 3, 6, and 9 of the 1996 SIPP panel. The 2001 and 2002 data are from waves 3 and 6 of the 2001 SIPP panel. The 2004 and 2005 data are from waves 3 and 6 of the 2004 SIPP panel. The 2009 and 2010 data are from waves 4 and 7 of the 2008 SIPP panel.

[2] We restrict the sample to include only respondents who remain in the sample for 12 months after the PRA balance is reported, which excludes between 11 and 22 percent of the respondents in all years except 2005. For 2005, 61 percent of the respondents are excluded because the sample size was reduced beginning with wave 8 of the 2004 panel. We also impose a second restriction. For about 1.6 percent of the sample the sum of monthly withdrawals exceeds the initial asset balance. If the initial PRA balance is positive, we retain the observation and set the withdrawal amount equal to the initial balance (0.4 percent). If the household reports a zero initial PRA balance, but positive subsequent withdrawals, we exclude the respondent from the analysis (1.2 percent). Some of these excluded respondents may have established new "rollover" PRAs (perhaps cash-outs from DB pensions) in the subsequent 12 months.

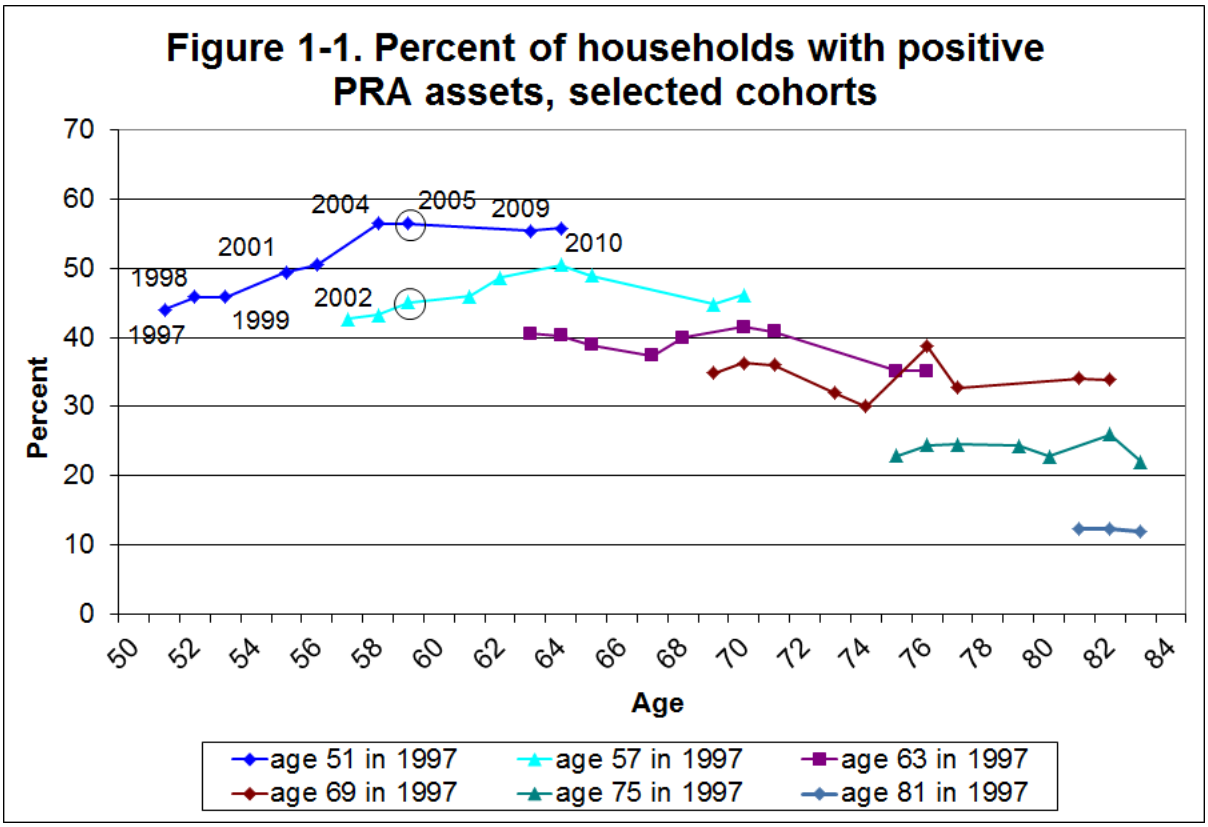
by cohort. For example, we can obtain data for 60-year-old households in 1997, 61-year-old households in 1998, and track this cohort through 73-year-old households in 2010. We identify each cohort by its age in 1997: "C60" refers to the cohort that was age 60 in 1997. These cohort data contain data from four distinct panel data sets that span shorter time periods. The same households were included in the SIPP surveys in 1997, 1998, 1999, and 2000. Another sample responded in 2001-2,a third sample responded in 2004-5, and a fourth sample responded in 2009-10. We treat the fourteen-year cohort data set as if it were drawn from a synthetic panel.

Table 1-1. Summary data by age interval and year, from SIPP (in 2010 dollars)

Year	Age interval				
	50-59	60-69	70-79	80+	all
	Number of Observations				
1997	4,814	3,505	3,326	1,802	13,447
1998	4,615	3,344	3,202	1,195	12,356
1999	4,784	3,308	3,208	1,187	12,487
2001	4,560	3,053	2,579	1,140	11,332
2002	4,575	3,115	2,538	1,063	11,291
2004	6,805	4,615	3,493	2,467	17,380
2005	3,161	2,115	1,623	800	7,699
2009	6,540	5,207	3,203	2,175	17,125
2010	6,144	5,110	3,184	1,433	15,871
all	45,998	33,372	26,356	13,262	118,988
	Percent with positive PRA balance				
1997	43.8	38.9	24.4	6.8	32.9
1998	45.5	40.6	26.9	10.8	36.3
1999	46.8	40.4	28.8	13.5	37.6
2001	49.3	41.3	30.6	17.3	39.9
2002	50.6	44.7	31.3	19.5	42.0
2004	57.2	50.3	38.8	19.4	46.6
2005	56.6	52.1	36.8	24.0	48.1
2009	55.9	52.1	39.4	29.2	48.5
2010	55.0	53.1	40.7	34.3	50.0
all	51.5	46.3	32.8	19.6	42.7
	Mean PRA balance				
1997	$34,644	$35,326	$17,885	$3,834	$26,642
1998	$40,942	$39,190	$21,214	$6,866	$32,344
1999	$49,500	$46,854	$27,539	$11,371	$39,944
2001	$52,339	$47,609	$27,080	$13,924	$41,747
2002	$45,304	$51,443	$30,012	$15,170	$40,965
2004	$61,119	$62,790	$43,746	$18,075	$52,125
2005	$64,084	$71,503	$43,936	$22,389	$57,869
2009	$62,573	$68,494	$53,007	$27,280	$58,253
2010	$64,397	$77,090	$60,337	$38,380	$65,502
all	$53,382	$56,565	$35,483	$17,656	$46,651
	Number of observations (households with a PRA)				
1997	2,034	1,282	752	116	4,184
1998	2,049	1,282	799	120	4,250
1999	2,205	1,259	864	147	4,475
2001	2,203	1,197	743	188	4,331
2002	2,238	1,317	741	201	4,497
2004	3,849	2,242	1,281	473	7,845
2005	1,754	1,035	565	191	3,545
2009	3,617	2,647	1,219	624	8,107
2010	3,296	2,621	1,241	463	7,621
all	23,245	14,882	8,205	2,523	48,855
	Mean PRA balance (households with a PRA)				
1997	$79,045	$90,904	$73,323	$55,984	$81,078
1998	$89,917	$96,480	$78,753	$63,613	$89,151
1999	$105,750	$116,097	$95,608	$84,472	$106,165
2001	$106,066	$115,354	$88,640	$80,663	$104,645
2002	$89,550	$115,085	$95,825	$77,707	$97,553
2004	$106,765	$124,717	$112,675	$93,020	$111,972
2005	$113,250	$137,308	$119,432	$93,388	$120,253
2009	$112,001	$131,369	$134,568	$93,271	$120,067
2010	$117,107	$145,254	$148,317	$111,997	$131,111
all	$103,683	$122,151	$108,224	$90,133	$109,370

Figure 1-1 shows the percent of households with positive PRA balances for six cohorts whose members were between the ages of 51 and 81 in 1997. The first cohort shown in the figure was 51 years old in 1997. When first observed at age 51, 44 percent of the households in this cohort had positive PRA balances. By 2010, when they were age 64, 55.8 percent had positive PRA balances. This figure shows large differences between cohorts, which we interpret as "cohort effects." Younger cohorts, those who reach a given age in a later year, are more likely to have a PRA than older cohorts. For example, 56.4 percent of the households that were 59 years old in 2005 had a PRA positive balance, but six years earlier, only 45 percent of the 59-year-old households had a PRA. This "cohort effect" equals the vertical distance between the two circled observations in the figure.

The presence of substantial cohort effects is not surprising given the growth of retirement saving plans during the last three decades. IRAs became broadly available in 1981, and 401(k) plans were not widely embraced by corporations until the early 1980s, although many firms did not adopt them until much later. Workers who were 51 years old in 2005 were age 28 in 1982, so they were potentially "exposed" to 401(k) plans for 23 years. In contrast, 83 year olds in 1999 were 66 in 1982; they are much less likely to have been able to participate in a retirement saving plan before they retired.



While Figure 1-1 highlights the rapid spread of PRAs in the past three decades, it does not control for any of the correlations of PRA ownership with household attributes such as earnings, non-PRA wealth holdings, and health status. These correlations can be important for explaining the evolution of PRA ownership, since it is possible that some of the age-related or cohort-related variation in PRA ownership rates may reflect age-varying or cohort-varying household attributes that are predictive of PRA ownership. These correlations are also important for the information that they provide about the attributes of the households who are making decisions about whether to draw down PRA assets.

To summarize the relationship between PRA ownership and various household attributes, we estimate probit specifications relating the probability that a household has a positive PRA balance to a set of indicator variables for household age, cohort (again measured as age of household head in 1997), and a set of other household attributes. The latter includes an indicator variable for whether the household is retired, an indicator variable for marital status, a measure of self-reported health status, earned income, annuity income, housing wealth, and non-housing wealth. Since we have chosen to include both age and cohort effects in our specification, we cannot separately identify time effects.

Table 1-2 presents estimates of the probit specifications, showing in each case the "coefficient" normalized to show the marginal relationship between each household attribute and the probability of having a PRA, and the "Z-score" which corresponds to a standard normal variable as a measure of statistical significance. The first column reports estimated age and cohort effects without controlling for other household attributes; it essentially replicates the profiles shown in Figure 1-1. Each cohort includes households in a three year age window. For example, cohort C54 includes cohorts C53, C54, and C55. The difference between the probability derivatives for the C39 cohort (the base cohort) and the C84 cohort is 0.754: a household in the oldest cohort in 1997 has a 75.4 percent lower probability of having a PRA, all else equal, than a household in the youngest cohort in 1997.

In modeling age effects, we allow for differences before and after a household reaches age 63. We do this with a piecewise linear function with a break at age 63. The probability of having a PRA increases with age through age 63, but there is little effect of age after 63. This is consistent with PRA accounts being opened while households are employed, but not after retirement.

The specification in the second column of Table 1-2 augments the first-column specification with variables corresponding to five sets of household attributes. The first "set" is only a single variable, an indicator for whether the household is retired or still working. In the case of married households, we make this determination based on whether the husband is still working. The second set of variables describes the household's marital status--single female, single male, or married. The third set of variables describes household income, split between earned income and annuity income. The latter could include Social Security benefits, payments from a defined

benefit pension plan, or payments from private annuity contracts. The fourth set of variables describes household wealth, which we divide into housing wealth and non-housing, non-PRA wealth. The fifth set of variables captures self-reported health status. The SIPP does not contain detailed information on specific attributes of health status, so we use self-reported health in our analysis. Each respondent can indicate poor, fair, good, very good, or excellent. We collapse these responses into two categories, "very good or excellent" and "fair or poor" ("good" is the excluded category). Estimates for each of the health status groups are obtained separately for single persons, married males and married females. Finally, all of the attributes are interacted with an indicator for whether the household is above or below the age of 63. We use this same set of household attributes in later explorations of PRA asset balances and withdrawal behavior, although in some case we replace the interaction with pre- and post-age 63 with an interaction with different age breaks. We do not assign any causal interpretation to the estimates from the probit model, but rather view this exercise as a way of describing the patterns of PRA ownership.

Table 1-2 Estimated probability of having a PRA account, probit marginal effects, households age 50 to 85

Variable	(1) Coef	(1) Z-score	(2) Coef	(2) Z-score
spline in age				
Age ≤63	**0.008**	**12.32**	**0.014**	**18.07**
Age>63	**-0.002**	**-4.26**	**-0.003**	**-4.51**
cohort effects				
Age 42 in 1997	-0.009	-0.79	**-0.030**	**-2.56**
Age 45 in 1997	-0.017	-1.74	**-0.063**	**-5.86**
Age 48 in 1997	**-0.044**	**-4.51**	**-0.100**	**-9.44**
Age 51 in 1997	**-0.075**	**-7.78**	**-0.150**	**-14.25**
Age 54 in 1997	**-0.104**	**-9.91**	**-0.181**	**-15.75**
Age 57 in 1997	**-0.152**	**-13.55**	**-0.233**	**-19.08**
Age 60 in 1997	**-0.184**	**-15.47**	**-0.252**	**-19.63**
Age 63 in 1997	**-0.232**	**-18.72**	**-0.289**	**-21.56**
Age 66 in 1997	**-0.245**	**-18.92**	**-0.273**	**-19.21**
Age 69 in 1997	**-0.266**	**-19.83**	**-0.270**	**-18.63**
Age 72 in 1997	**-0.306**	**-21.44**	**-0.286**	**-18.60**
Age 75 in 1997	**-0.375**	**-24.43**	**-0.347**	**-20.80**
Age 78 in 1997	**-0.472**	**-28.37**	**-0.415**	**-22.90**
Age 81 in 1997	**-0.558**	**-27.76**	**-0.506**	**-23.05**
Age 84 in 1997	**-0.754**	**-26.80**	**-0.668**	**-21.27**
self-reported retirement status				
retired if age≤63			**0.042**	**5.80**
retired if age>63			**-0.081**	**-10.01**
marital status				
Single male if age ≤63			**-0.060**	**-8.47**
Single male if age>63			-0.013	-1.61
Married if age ≤63			**0.056**	**5.64**
Married if age>63			**0.095**	**10.16**
income				
Earned income if age ≤63			**0.034**	**22.60**
Earned income if age>63			**0.023**	**12.23**
Annuity income if age ≤63			**0.013**	**5.92**
Annuity income if age>63			**0.055**	**30.53**
wealth (in 10,000's)				
Housing wealth if age ≤63			**0.004**	**17.79**
Housing wealth if age>63			**0.005**	**27.83**
Nonhousing wealth if age ≤63			**0.001**	**5.20**
Nonhousing wealth if age>63			**0.000**	**2.44**

Variable	(1) Coef	(1) Z-score	(2) Coef	(2) Z-score
health status - single persons				
VG or excellent if age ≤63			**0.129**	**16.89**
VG or excellent if age>63			**0.078**	**10.13**
Fair or poor if age ≤63			**-0.213**	**-22.43**
Fair of poor if age>63			**-0.179**	**-20.60**
health status - married male				
VG or excellent if age ≤63			**0.019**	**2.38**
VG or excellent if age>63			**0.034**	**3.84**
Fair or poor if age ≤63			**-0.099**	**-9.84**
Fair of poor if age>63			**-0.077**	**-8.35**
health status - married female				
VG or excellent if age ≤63			**0.064**	**8.29**
VG or excellent if age>63			**0.072**	**8.37**
Fair or poor if age ≤63			**-0.051**	**-5.01**
Fair of poor if age>63			**-0.084**	**-8.79**
Intercept	**-0.348**	**-10.58**	**-0.931**	**-21.45**
number of observations	118,988		118,988	
Wald chi2(2)	6,273		16,419	
Prob > chi2	0.0000		0.0000	
Pseudo R2	0.0492		0.2060	

The estimates suggest that household attributes are strongly related to the probability of PRA ownership. We note two findings in particular. First, holding other

attributes constant, those with greater earned income, with greater annuity income, and with greater wealth in either housing equity or other assets are more likely to report a positive PRA balance. Second, persons in better health are also more likely and those in poor health less likely to have a PRA. We do not interpret these results as necessarily reflecting causal relationships, as a higher value of non-PRA wealth for example may, conditional on income, be capturing household attributes such as discount rates that influence the accumulation of both PRA and non-PRA wealth.

Several examples can illustrate the quantitative importance of these findings. Among those under 63 years of age, a married person is 11.6 percent more likely to have a PRA than a single man is. For someone under the age of 63, a $10,000 increase in earned income is associated with a 3.4 percent increase in the probability of having a PRA. For those over 63, and likely to be retired, a $10,000 increase in annuity income is associated with a 5.5 percent increase in the probability of having a PRA. For those under 63, each $10,000 increase in housing wealth is associated with roughly a 0.4 percentage point increase in the probability of having a PRA; the effect of the same addition to non-housing wealth is only about 0.1 percentage points.

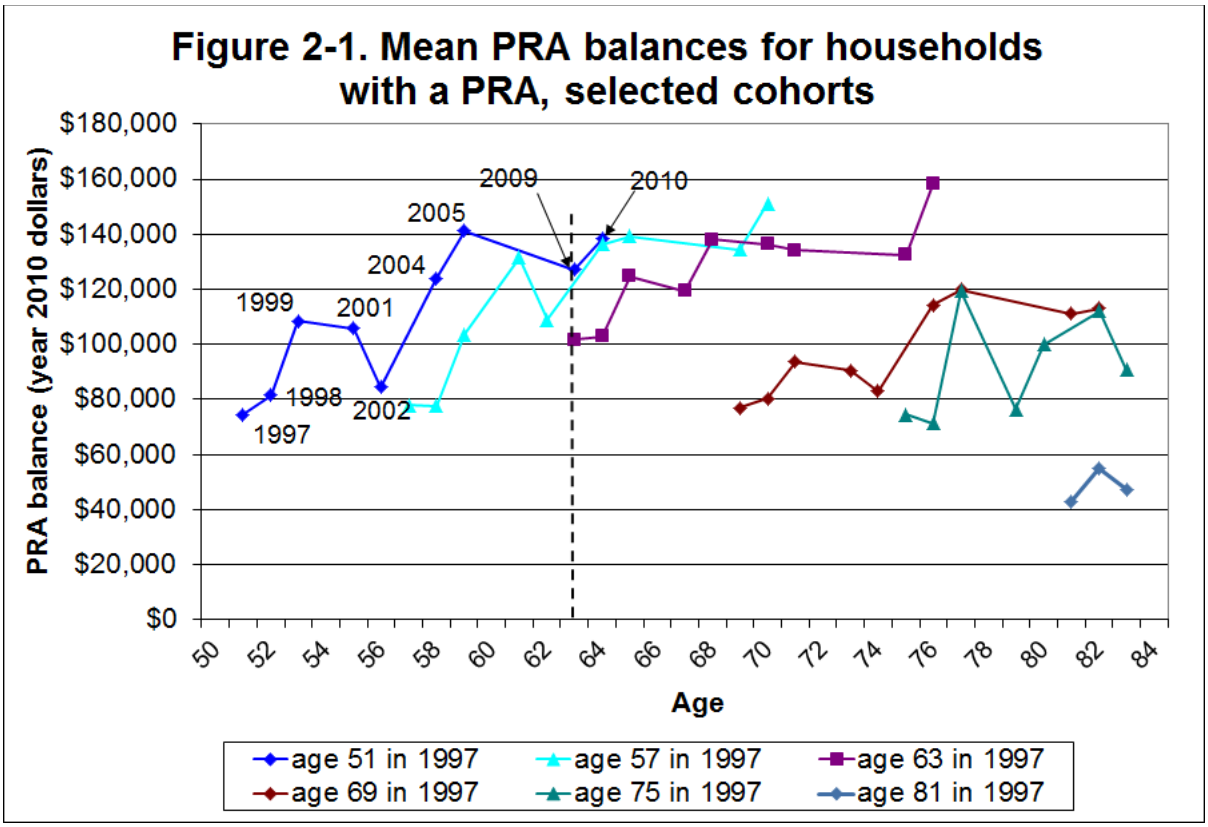
The results in Table 1-2 also display a strong relationship between health status and the probability of PRA ownership. Controlling for the other household attributes that are included in the probit models, persons in poor health are much less likely than persons in good health to have a PRA. Among those who are not yet 63 years of age, single persons in very good or excellent health are 34 percent more likely to have a PRA than are those in fair or poor health. For married men (women) the difference is 11.8 (11.5) percent. This finding complements the finding in Poterba, Venti, and Wise (2011a) that households in good health near retirement age have higher lifetime earnings than those in poor health, greater earnings at retirement, greater annuity income after retirement, and more non- PRA wealth.

To illustrate the findings in Table 1-2 and Table 1-3, we report the probability of PRA ownership for four hypothetical households with different sets of attributes. These probabilities are computed using the coefficient estimates that underlie the marginal probability effects in Table 1-2. We focus on households between the ages of 60 and 63, and consider separately retired and not-yet-retired households. We consider "low-percentile" households with low income (10^{th} percentile), low wealth, and poor health, and "high-percentile" households with high income (90^{th} percentile), high wealth, and good health. The 10^{th} and 90^{th} percentiles approximate persons in the bottom and top quintiles of each attribute. For low-percentile households that are not retired, the predicted probability of PRA ownership is only about 5 percent. By comparison, for the high-percentile non-retired households, the predicted probability is 78 percent. For retired households in this age range, about 7 percent of the low-percentile households are predicted to have a PRA, compared to about 56 percent of high-percentile households. These summary measures underscore the importance of household attributes in potentially explaining differences in PRA ownership.

2. PRA Balances

Since we are interested not just in the amount withdrawn from PRAs, but also in the share of assets withdrawn, we need to consider not just the ownership of these accounts but also their balances. Figure 2-1 shows average PRA balances (in $2010) at each age for selected cohorts labeled by the cohort age in 1997. The data are for 1997, 1998, 1999, 2001, 2002, 2004, 2005, 2009 and 2010. The figure suggests two key conclusions. First, younger cohorts have higher average PRA asset levels at each age. Second, in most cases, within cohorts for which we have at least two years of data, assets tend to increase as the cohort ages. However, several cohorts show a decline in assets between 1999 and 2002 (presumably reflecting the decline in stock prices following the dot-com bubble) and between 2005 and 2009 (reflecting the financial crisis). VanDerhei (2009) provides a detailed analysis of the effect of the 2008 recession and the associated financial crisis on 401(k) account balances. The 37 percent decline in the U.S. equity market in 2008 substantially reduced average 401(k) and other PRA balances. Munnell (2012) shows that the median 401(k) balance for households approaching retirement in 2010 was roughly the same as that in 2007. Her findings suggest that the negative effect of the financial market decline largely offset the positive effects of three years of additional contributions to the system, and the further maturation of the 401(k) system more generally.

The general pattern suggests that for most ages and cohorts in most years, the increase in asset balances arising from new contributions and from returns on existing balances exceeds the reduction in assets due to withdrawals. In comparing the average PRA balances as cohorts age, but while many members of the cohort are still in the labor force, there are potentially four distinct effects at work: the investment return and contribution effects that increase existing PRA balances, the withdrawal effect that reduces them, and the "new account opening" effect that adds low-balance new accounts into the set of PRAs over which we average to compute the cohort mean PRA balance. Thus even if PRA balances rose for all existing PRA holders at a given age, it would still be possible in principle for the average PRA balance to decline as the cohort aged. Our findings suggest that this effect does not play a dominant role.



To identify the household attributes that are associated with high and low levels of PRA assets, we specify a simple model for these balances (B):

$$(1) \quad B_i = \alpha e^{Z_i \gamma} + \varepsilon_i$$

where Z_i is a vector that includes age and cohort effects, as well as the same set of household attributes that we analyzed in the last section. Now, the coefficients (γ) indicate the percentage change inB that would be associated with a unit change in the corresponding $Z_i$variable. We estimate (1) by nonlinear least squares (NLLS) for all households with a positive PRA balance. We also estimated the log-linear counterpart to (1), regressing $\ln(B_i)$ on Z_i.The two specifications are similar except for the distribution of the error term. The fitted values from the specification in equation (1) tracked actual PRA balances more closely than those from the log-linear specification, so we focus on that model.

Table 2-1 reports the results of estimating (1) by NLLS. We begin in column one with a simple specification that includes only age and cohort effects, and then add additional covariates. The age estimates are specified as piecewise linear with breaks at 69 and 71 to allow for a change in asset evolution at the age at which RMDs begin. For households below the age of 69, the estimates indicate that PRA assets increase on average by 3.9 percent per year. Between ages 69 and 71, there is no statistically

significant change in assets. At ages above 71, PRA assets increase at an average rate of 1.1 percent per year. These findings suggest that over our data period, asset returns and the contributions of our still-working sample members more than offset asset outflows due to withdrawals as well as the "small account opening effect" for working-age cohorts. We observe the pattern of rising average PRA balances both before and after cohorts reach age 70 ½ and need to begin RMD withdrawals. The estimates in column 1 also show substantial cohort effects, similar to those observed in Figure 2-1.

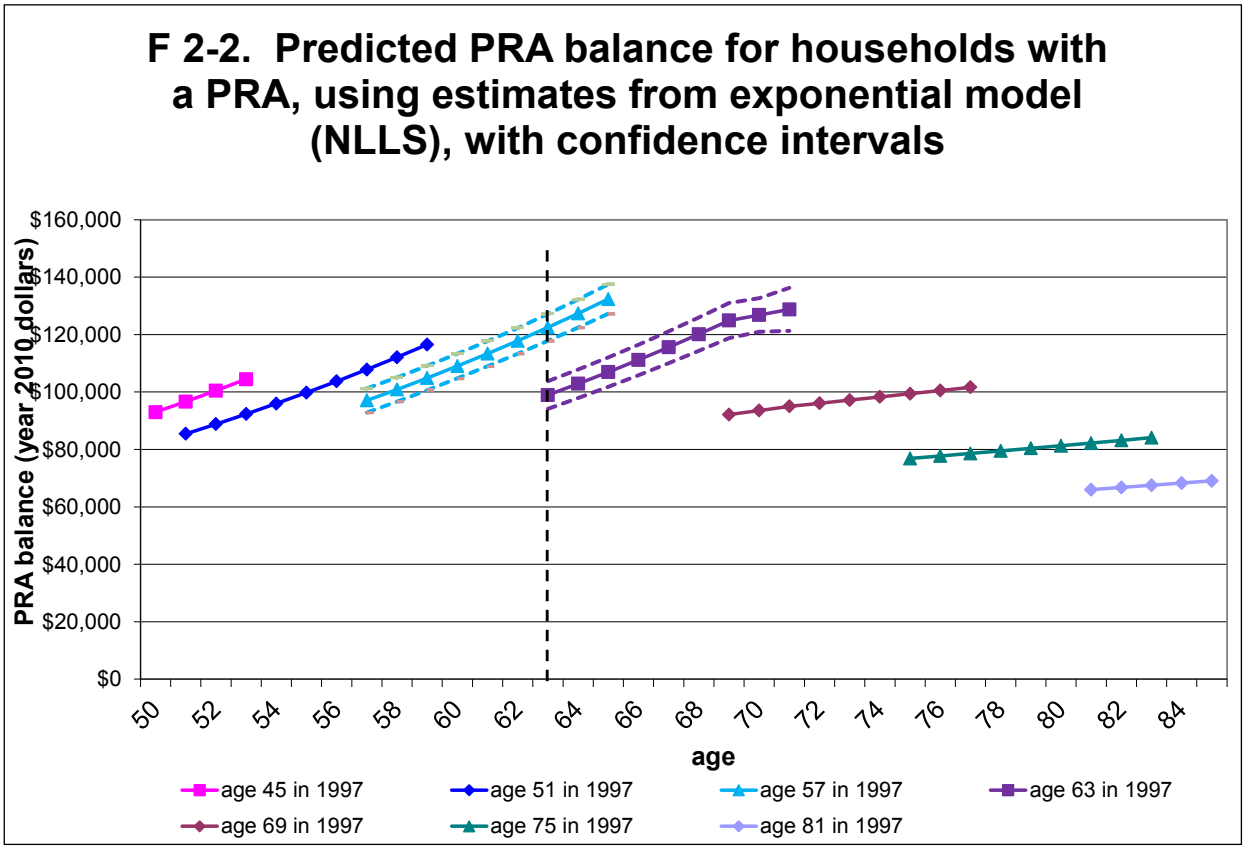
Table 2-1 Non-linear least squares estimates of PRA balance for households with a PRA account, households age 50 to 85

Variable	(1) Coef	(1) z-score	(2) Coef	(2) z-score
spline in age				
Age≤69	**0.039**	**21.35**	**0.037**	**17.12**
69<age≤71	0.015	1.07	0.045	1.27
Age>71	**0.011**	**2.89**	**0.012**	**2.56**
cohort effects				
Age 42 in 1997	-0.057	-1.47	**-0.090**	**-2.22**
Age 45 in 1997	-0.063	-1.78	**-0.117**	**-3.33**
Age 48 in 1997	**-0.111**	**-3.21**	**-0.205**	**-5.91**
Age 51 in 1997	**-0.187**	**-5.38**	**-0.325**	**-9.16**
Age 54 in 1997	**-0.241**	**-6.42**	**-0.390**	**-9.85**
Age 57 in 1997	**-0.292**	**-7.25**	**-0.444**	**-10.39**
Age 60 in 1997	**-0.384**	**-8.98**	**-0.517**	**-11.37**
Age 63 in 1997	**-0.505**	**-11.04**	**-0.633**	**-13.09**
Age 66 in 1997	**-0.656**	**-13.51**	**-0.736**	**-14.56**
Age 69 in 1997	**-0.809**	**-15.89**	**-0.832**	**-15.59**
Age 72 in 1997	**-0.925**	**-16.67**	**-0.944**	**-15.72**
Age 75 in 1997	**-1.066**	**-16.58**	**-1.054**	**-15.05**
Age 78 in 1997	**-1.200**	**-15.86**	**-1.200**	**-14.54**
Age 81 in 1997	**-1.286**	**-12.23**	**-1.323**	**-11.60**
Age 84 in 1997	**-1.151**	**-5.56**	**-1.098**	**-4.92**
self-reported retirement status				
retired if age≤69			0.032	1.32
retired if 69<age<72			0.030	0.37
retired if age≥72			-0.040	-0.61
marital status				
Single male if age≤69			**0.339**	**12.74**
Single male if 69<age<72			**0.223**	**2.39**
Single male if age≥72			**0.322**	**5.98**
Married if age≤69			**0.532**	**15.67**
Married if 69<age<72			**0.484**	**4.74**
Married if age≥72			**0.483**	**7.80**
income sources (in 10,000s)				
Earned income if age≤69			**0.019**	**18.72**
Earned income if 69<age<72			0.008	1.40
Earned income if age≥72			0.007	1.60
Annuity income if age≤69			**0.044**	**9.58**
Annuity income if 69<age<72			**0.062**	**5.86**
Annuity income if age≥72			**0.045**	**6.56**
wealth (in 10,000's)				
Housing wealth if age≤69			**0.009**	**21.93**
Housing wealth if 69<age<72			**0.010**	**8.14**
Housing wealth if age≥72			**0.009**	**10.58**
Nonhousing wealth if age≤69			**0.000**	**2.87**
Nonhousing wealth if 69<age<72			**0.001**	**5.24**
Nonhousing wealth if age≥72			**0.000**	**4.25**

Variable	(1) Coef	(1) z-score	(2) Coef	(2) z-score
health status - single persons				
VG or excellent if age≤69			**0.233**	**7.80**
VG or excellent if 69<age<72			0.167	1.87
VG or excellent if age≥72			**0.272**	**4.72**
Fair or poor if age≤69			**-0.157**	**-3.15**
Fair or poor if 69<age<72			-0.237	-1.59
Fair or poor if age≥72			0.137	1.86
health status - married male				
VG or excellent if age≤69			**0.121**	**6.18**
VG or excellent if 69<age<72			-0.133	-1.65
VG or excellent if age≥72			0.034	0.80
Fair or poor if age≤69			**-0.193**	**-5.48**
Fair or poor if 69<age<72			-0.155	-1.46
Fair or poor if age≥72			0.010	0.19
health status - married female				
VG or excellent if age≤69			**0.134**	**6.81**
VG or excellent if 69<age<72			0.154	1.86
VG or excellent if age≥72			**0.195**	**4.62**
Fair or poor if age≤69			-0.042	-1.21
Fair or poor if 69<age<72			-0.182	-1.45
Fair or poor if age≥72			0.080	1.41
Alpha	**1.424**	**10.29**	**0.690**	**8.30**
number of observations	48,855		48,855	
RMSE	13.513		12.480	

We can use the estimated age and cohort coefficients from the first column of Table 2-1 to predict PRA balances for any cohort at any age. These are shown in Figure 2-2. For example, households that attained age 63 in 2003, which were therefore members of the C57 cohort (they were 57 in 1997), are predicted to hold PRA assets of $122,485 (in year 2010 dollars) at age 63, while households that attained age

63 six year earlier in 1997 are predicted to hold PRA assets of only $98,955 – a 24 percent difference. Figure 2-2 also shows 95 percent confidence bands for these two predictions.



The estimates in the second column of Table 2-1 describe the relationship between PRA balances and household attributes. We use the same set of household attributes as in the foregoing estimates, but we now interact each household attribute with three age segments: less than age 69, age 69 to 71, and greater than age 71. The marginal estimates, like those for the probability of having a PRA, show that average balances are higher for those who are married, have greater earned income or annuity income, have greater housing wealth and greater non-housing wealth, and are in better health. Among households under the age of 69, single men have 34 percent more in PRA assets than single females (the omitted group) and married households have 53 percent more in PRA assets than single females. An additional $10,000 in earned income is associated with 1.9 percent more in PRA assets, and an additional $10,000 in annuity income is associated with a 4.4 percent increase in PRA wealth. An additional $10,000 in housing wealth is associated with a 0.9 percent increase in PRA assets; an additional $10,000 in non-housing wealth with an increase of 0.03 percentage points (rounded to zero in Table 2-1) in PRA assets. Single persons in very good or excellent health have 39 percent more in PRA assets than single persons in fair or poor health. This difference is 31.4 percent for married men and 17.6 percent for married women.

Table 2-2. Estimated PRA balance, for selected attributes, households age 60 to 63.

Attributes and probability		
	Not retired	
Marital status	Single Male.	Married
Earned income	10th pctile	90th pctile
Annuity income	0	0
Housing wealth	10th pctile	90th pctile
Nonhousing wealth	10th pctile	90th pctile
Health	Fair-Poor	Ex-VG
PRA balance	**$66,903**	**$220,923**
	Retired	
Marital status	Single Male.	Married
Earned income	0	0
Annuity income	10th pctile	90th pctile
Housing wealth	10th pctile	90th pctile
Nonhousing wealth	10th pctile	90th pctile
Health	Fair-Poor	Ex-VG
PRA balance	**$69,047**	**$218,075**

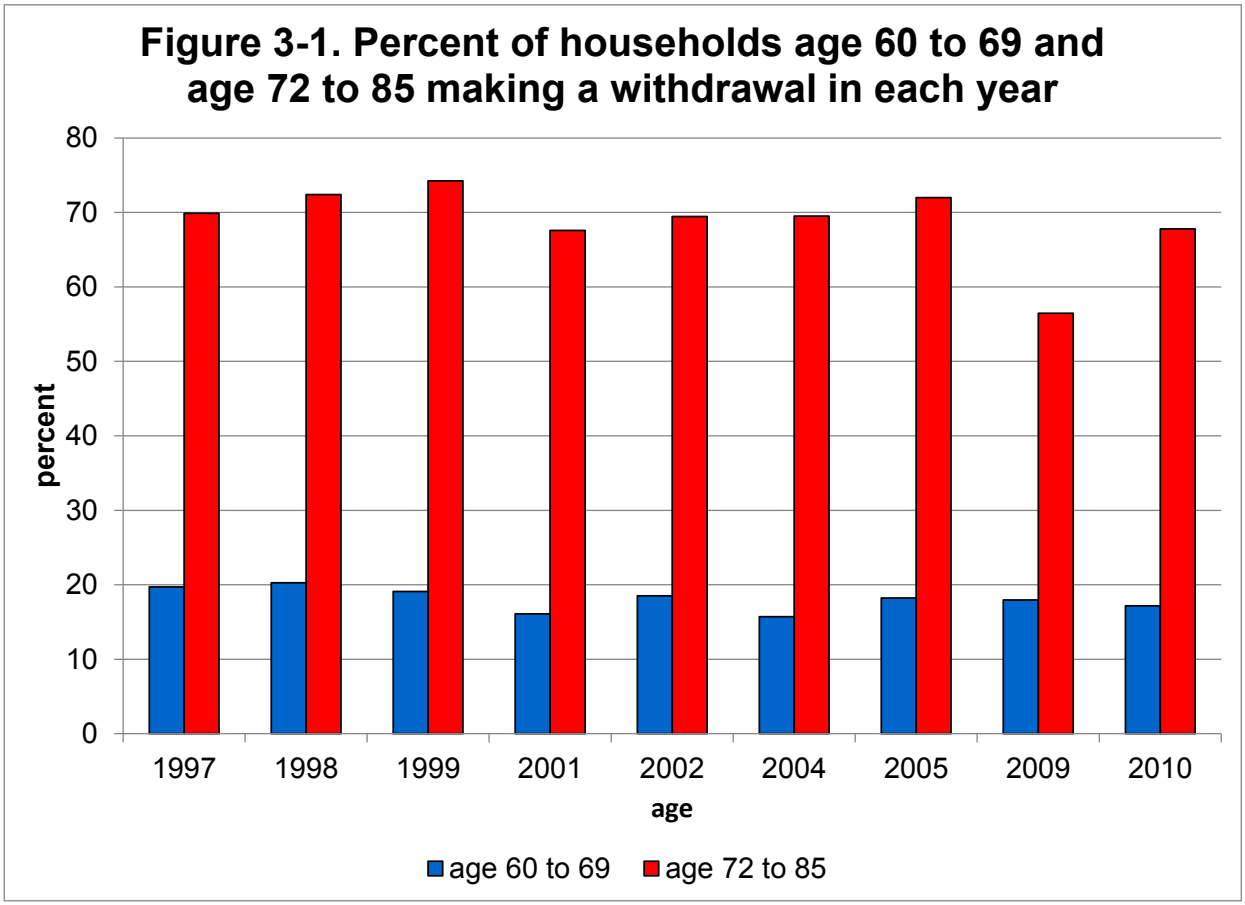
Table 2-2 illustrates the combined relationship between different sets of household attributes and PRA balances, using the same approach that we applied in the previous section. We again consider households between the ages of 60 and 63, and use the same "low-percentile" and "high-percentile" sets of attributes as above. The first column of Table 2-2 shows the predicted PRA balance for a household with low income, low wealth, and poor health. The next column shows the balance for a household with high income, high wealth, and good health. For households in the 60 to 63 age range who are not retired, the predicted balance for households in the low-percentile group is $66,903, compared to $220,923 for those in the high-percentile group. For households in this age group who are retired, the values are $69,047 and $218,075, respectively.

3. The Probability of a PRA Withdrawal

We e now examine data on the central focus of our study: PRA withdrawals. We begin by using data from the SIPP to calculate withdrawals from all PRAs as a proportion of balances. Respondents are asked to provide the amount received from a draw on an IRA, Keogh, 401(k) or Thrift Plan in each month during the 1997 to 2010 period. Recall that they are also asked to provide balances in these various accounts at seven different points in time between 1997 and 2010. We calculate the annual withdrawal rate as the sum of all withdrawals during the twelve months following a month in which the balance is reported, divided by the reported balance. In this section we examine the probability of any withdrawal during a twelve month period, and in the next we analyze withdrawals as a percentage of the PRA balance.

Figure 3-1 shows the percentage of PRA owners making a withdrawal in each year. Results are presented for persons age 60-69 (eligible, but not required, to make a withdrawal) and for persons age 72 to 85 who are subject to RMDs. Two features stand out. First the data show almost a fifteen percentage point decline in the withdrawal rate for those 72-85 in 2009, a year when RMDs were suspended as part of the fiscal stimulus package. There is no decline, however, in the withdrawal rate of those between the ages of 60 and 69 who are not affected by the RMD rules. Because

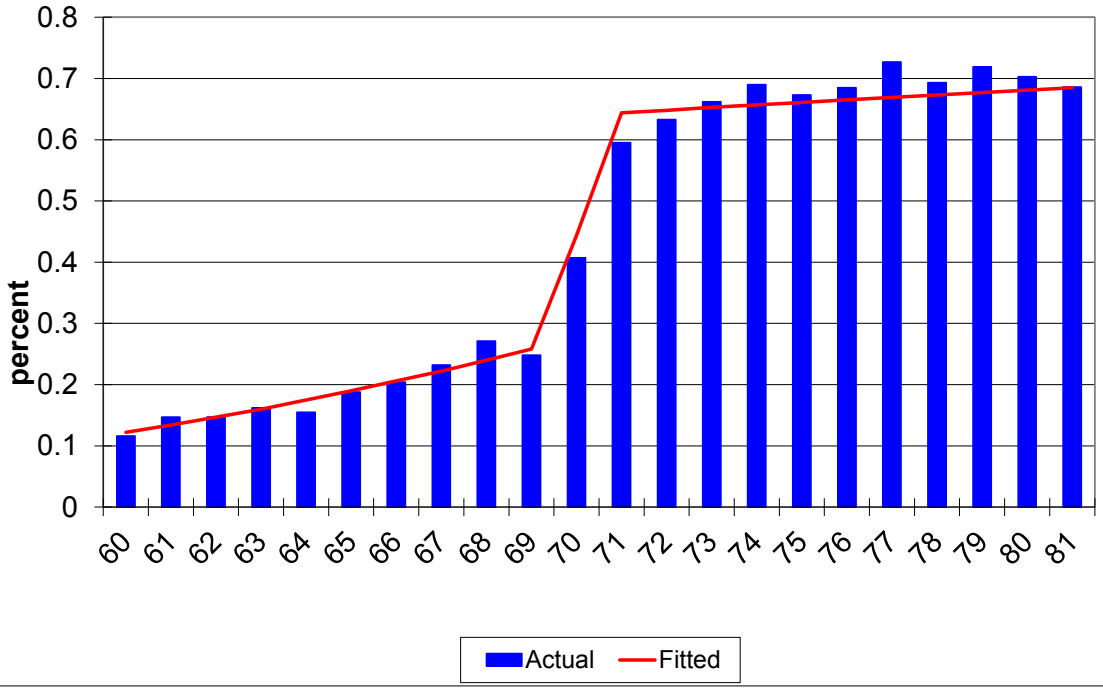
more than half of all households over the age of 72 continue to take withdrawals in 2009, however, it seems that the RMD rules were not binding for a substantial fraction of households over the age of 70 1/2. Another possible explanation is that the "year" 2009 in the SIPP data imperfectly aligns with the calendar year that governs RMDs. The SIPP module that yielded the PRA balance was in the field between September and December 2009 and this balance is matched to withdrawals over the next 12 months and thus our "2009" estimate is likely to include many withdrawals that were made in 2010, when the RMD rules were back in force.



Given the similarity of withdrawal rates across the years other than 2009 in Figure 3-1, we combine all of the years to show the age-specific probability of a withdrawal from a PRA in Figure 3-2. The entry for each age combines data from several cohorts, so it pools information from households who were that age in different years. As we will show below, the cohort effects are negligible for this series. The percentage of households making a withdrawal grows slowly from a little over 10 at age 60 to about 25 at age 69. Between the ages of 69 and 71, however, it jumps to over 60, and fluctuates around 70 for households over the age of 73. Figure 3-1 shows that at ages prior to 70 ½, most households with PRAs are not making withdrawals. The probability of making a withdrawal only exceeds fifty percent after age 70 ½.

The second striking feature of Figure 3-1 is that not all households beyond the age of 70 1/2 are making withdrawals, even though we might expect them to be facing required minimum distributions. One potential explanation of this finding is that holders of Roth IRAs (and holders of Keoghs if they are still working) are not subject to required minimum distributions, which apply to traditional IRAs and to rollover IRAs. Among households age 72 to 85 in the SIPP, the withdrawal rate for households with zero earnings is 8 percentage points higher than the rate for households with earnings. Holden and Schrass (2010b) report that 28.9 percent of all IRAs are Roth IRAs and 40.1 percent of households with an IRA have a Roth IRA (many households have multiple IRAs). Copeland (2009), based on data from the 2007 Survey of Consumer Finances, reports that that 31.7 percent of households with an IRA have at least one Roth IRA. Because the availability of Roth IRAs is a relatively recent phenomenon, the fraction of elderly households owning Roth IRAs is likely to be lower than the fraction of all households owning Roth IRAs, but is nonetheless likely to be substantial.

Figure 3-2. Percent of households with PRA making a withdrawal, actual and fitted using SIPP data for 1997 to 2010



Another explanation of the finding that the probability of withdrawal is below 100 percent for households over the age of 70 ½ is that in married couples, the owner of the PRA may be the wife, and she may be younger than the husband, whose age was used to determine the household's "age." If the wife is not yet 70 ½, she is not required to make a distribution from her PRA.

Data sources other than the ones we consider also show withdrawal rates well under 100 percent for households older than the RMD age. The Investment Company

Institute's IRA Owners Survey, which is summarized in Holden and Schrass (2010a), finds that only 73 percent of households aged 70 or older with a traditional IRA made a withdrawal in 2008. The analogous statistics were 70 percent in 2009 and 53 percent in 2010 (the RMD was suspended in tax year 2010). Tabulations of IRS data by Bryant and Sailer (2006) show that 82.6 percent of households headed by someone between the ages of 70 to 75, 81.7 percent of those headed by someone between the ages of 75 and 80, and only 61.8 percent of households headed by someone over the age of 80 made distributions in tax year 2001. Unpublished tabulations from the Survey of Consumer Finances by the Investment Company Institute suggest somewhat higher rates of withdrawal -- approximately 82 percent -- for households over the age of 70.

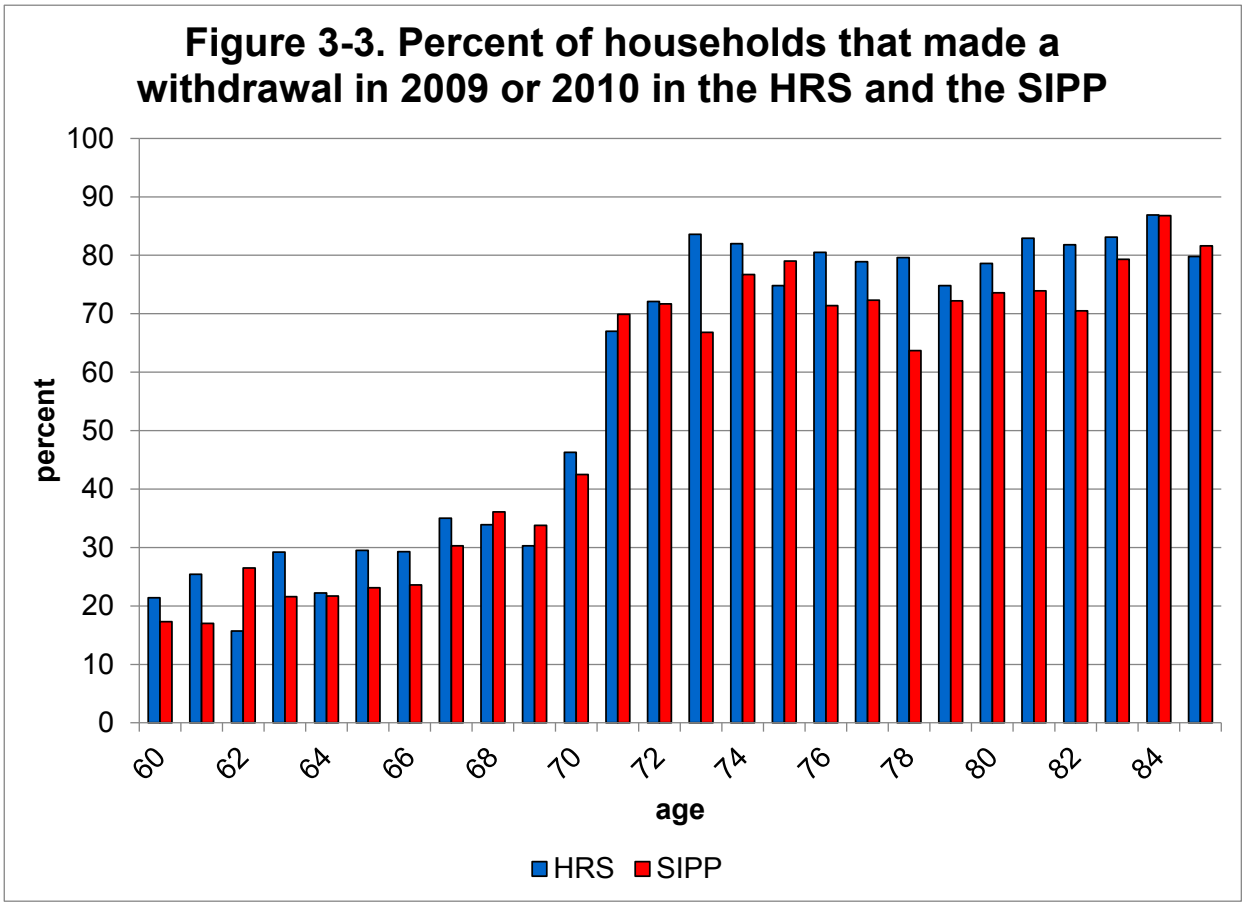
Yet a third possible explanation for the low withdrawal rate is that survey respondents were confused by or misinterpreted the survey question.[3] They were asked if they "… receive income from a draw on an IRA/Keogh/401k or Thrift Plan in this month?" Some respondents who withdrew funds from an IRA or 401(k) may simply have transferred the funds to a taxable account with the same financial institution, and they may not have considered this transaction one that gave them income from their PRA. Holden and Schrass (2010b) report that about 30 percent of households (of all ages) making an IRA withdrawal indicating that they "reinvested or saved it in another account." At some institutions, the transfer of funds in conjunction with RMD requirements may even be automatic; this may increase the likelihood of household mis-reporting.

A final explanation may be the misalignment of the SIPP "year" and the tax year. The SIPP provides withdrawal amounts in all months, but the PRA balance is only available at a point in time that can occur anytime in the calendar year. The SIPP, for example, might provide a PRA balance for September 2004 and we match this balance with withdrawals over the next 12 months. Thus the SIPP "year" of 2004 spans the tax years of 2004 and 2005. A person may make a full RMD for 2004 prior to September of that year and may make the 2005 RMD after September 2005. In such a case the person has fully complied with IRS requirements, but our data will indicate no distribution in the 12 month period after we observe the PRA balance.

The low rate of PRA withdrawal observed in the SIPP, in data collected by the ICI, and in IRS data is also observed in the Health and Retirement Study (HRS). The HRS asks whether the respondent withdrew funds since the last interview wave, a period of approximately two years. Figure 3-3 compares the withdrawal rate in the 2010 HRS to the two-year (2009 and 2010) rate in the SIPP. The HRS only contains complete information on balances in IRA and Keogh plans, while the SIPP data include all 401(k) and 401(k)-like plans, thrift saving plans, IRAs and Keogh accounts. At retirement, many 401(k) balances are rolled over into an IRA and thus the IRA

[3] Low withdrawal rates appear to be a problem with all household surveys. Sabelhaus and Schrass (2009) compare aggregate from the Current Population Survey, the Survey of Consumer Finance and the ICI Tracking/IRA Survey with IRA distributions reported to the Internal Revenue Service. They find that each of the household surveys substantially underestimates withdrawals.

balances in the HRS may include assets that were originally accumulated in 401(k) accounts. In spite of the differences in the two data sources, the results in Figure 3-3 suggest remarkable agreement with respect to withdrawal behavior. Both surveys suggest that many households only begin to withdraw funds when forced to do so at the RMD age, and both show that the overall withdrawal rate is well under 100 percent following the RMD age.



To describe the relationship between household attributes and the likelihood that a household makes a withdrawal, we use the SIPP data to estimate probit models using the same set of explanatory variables that we considered in our earlier data analysis. The results, which are reported in Table 3-1, show the marginal relationship between household attributes and the probability of making a withdrawal for households with a PRA. This table has three columns. The first shows estimates of the relationship between the withdrawal probability and age, with age specified as a piecewise linear function with three segments—60 to 69, 70 to 71, and 72 to 85. The estimation sample includes all households headed by someone between the ages of 60 and 85. The estimates in column 1 are used to estimate the relationship between age and the probability of withdrawal and the predictions based on these estimates are overlayed on the actual data on age-specific withdrawal rates in Figure 3-2; this is the "fitted" line in that figure.

The estimates show that the probability of withdrawal increases by 0.021 per year of age (with z-score of 12.99) for households younger than age 69, by 0.188 (z-score of 30.38) between ages of 69 and 71, and by 0.004 per year of age (z-score of 3.40) for households over the age of 71. The large estimate of the effect of passage through the age at which RMDs are first required suggests that many households are postponing distributions until they reach age 70 ½.

The second column of Table 3-1 shows estimated age and cohort effects. The cohort effects are small and the age effects change very little when the cohort effects are added. This finding supports our use of pooled data from all cohorts in constructing Figure 3-2. The estimates in the third column of Table 3-1 add the additional household attributes used in earlier specifications as well as the PRA balance. Fewer than half of the household attributes are significantly related to the probability of withdrawal. For all age groups, persons with $10,000 or more in PRA balances are about 1.2 percent more likely to make a withdrawal. For those below age 69, retired households are 37.3 percent more likely to withdraw. Households with earned income in all age groups are less likely to withdraw assets from their PRAs. The probability of making a withdrawal declines between 3.8 and 5.8 percentage points for each $10,000 increase in earned income.

Finally, for households under the age of 69, single persons in very good or excellent health are 31 percent less likely to make a withdrawal than single persons in fair or poor health. The health effects for married men and women are not statistically significant. The estimates for the younger group are consistent with the hypothesis that PRA balances are drawn down in times when households encounter high medical expenses, but the estimates for those over age 72 do not offer support for this view. To further understand this pattern, one would need better information on the conditions that led to individuals or households classifying themselves as in poor health, and whether these conditions were associated with substantial out-of-pocket expenses.

We compute the predicted probability of a withdrawal using our “high percentile” and “low percentile” attributes as in the previous sections; the results are shown in Table 3-2. The probit specifications in Table 3-1 include the PRA balance as a covariate. We consequently hold the PRA balance constant at its sample mean for both the high- and low-percentile households in Table 3-2. We include annuity income, as well as housing and non-housing wealth, in the set of household attributes that we consider even though the estimated effects of these variables are typically not significantly different from zero in our probit specifications. To highlight the effect of the PRA balance, Table 3-2 also includes two additional panels showing the relationship between the PRA balance and the withdrawal probability. These panels show averages for the bottom and top quintiles of the distribution of PRA assets. Thus the top panels of this table show the effect of household attributes on the probability of withdrawal, holding the PRA balance constant. The bottom panel adds the effect of the PRA balance on the probability of withdrawal, allowing it to vary in the same “percentile” fashion as the other household attributes.

Table 3-1 Estimated probability of making a withdrawal, probit marginal effects, households age 60 to 85

Variable	(1) Coef	(1) Z-score	(2) Coef	(2) Z-score	(3) Coef	(3) Z-score
spline in age						
Age≤69	**0.021**	**12.99**	**0.019**	**9.79**	**0.018**	**3.07**
69<age≤71	**0.188**	**30.38**	**0.179**	**27.39**	**0.530**	**14.05**
Age>71	**0.004**	**3.40**	-0.001	-0.94	**-0.019**	**-4.14**
cohort effects						
Age 51 in 1997			-0.039	-1.84	-0.102	-1.70
Age 54 in 1997			0.000	0.02	-0.010	-0.18
Age 57 in 1997			-0.009	-0.47	-0.026	-0.45
Age 60 in 1997			-0.004	-0.21	-0.065	-1.16
Age 63 in 1997			0.005	0.25	-0.015	-0.26
Age 66 in 1997			0.029	1.29	0.054	0.87
Age 69 in 1997			0.037	1.59	0.117	1.80
Age 72 in 1997			**0.083**	**3.44**	**0.248**	**3.63**
Age 75 in 1997			**0.119**	**4.44**	**0.378**	**4.99**
Age 78 in 1997			**0.096**	**3.19**	**0.355**	**4.23**
Age 81 in 1997			**0.131**	**3.30**	**0.479**	**4.36**
Age 84 in 1997			0.114	1.63	**0.456**	**2.36**
self-reported retirement status						
retired if age≤69					**0.373**	**10.22**
retired if 69<age<72					0.128	1.48
retired if age≥72					**0.161**	**2.53**
PRA balance (in 10,000's)						
PRA balance if age≤69					**0.012**	**13.14**
PRA balance if 69<age<72					**0.012**	**4.87**
PRA balance if age≥72					**0.013**	**9.43**
marital status						
Single male if age≤69					0.023	0.46
Single male if 69<age<72					0.167	1.58
Single male if age≥72					-0.059	-1.11
Married if age≤69					-0.034	-0.62
Married if 69<age<72					**-0.266**	**-2.39**
Married if age≥72					-0.100	-1.77
income sources (in 10,000s)						
Earned income if age≤69					**-0.038**	**-7.48**
Earned income if 69<age<72					**-0.058**	**-4.31**
Earned income if age≥72					**-0.041**	**-5.41**
Annuity income if age≤69					0.000	0.05
Annuity income if 69<age<72					-0.002	-0.15
Annuity income if age≥72					**0.030**	**3.56**
wealth (in 10,000's)						
Housing wealth if age≤69					**-0.003**	**-3.20**
Housing wealth if 69<age<72					0.002	1.27
Housing wealth if age≥72					0.001	0.98
Nonhousing wealth if age≤69					**-0.001**	**-2.14**
Nonhousing wealth if 69<age<72					0.000	-0.26
Nonhousing wealth if age≥72					0.000	0.41

Variable	(1) Coef	(1) Z-score	(2) Coef	(2) Z-score	(3) Coef	(3) Z-score
health status - single persons						
VG or excellent if age≤69					**-0.125**	**-2.50**
VG or excellent if 69<age<72					-0.067	-0.68
VG or excellent if age≥72					0.015	0.29
Fair or poor if age≤69					**0.185**	**2.62**
Fair or poor if 69<age<72					-0.018	-0.13
Fair or poor if age≥72					-0.043	-0.64
health status - married male						
VG or excellent if age≤69					0.012	0.33
VG or excellent if 69<age<72					**0.228**	**2.67**
VG or excellent if age≥72					-0.019	-0.41
Fair or poor if age≤69					-0.023	-0.43
Fair or poor if 69<age<72					0.089	0.80
Fair or poor if age≥72					**-0.110**	**-2.17**
health status - married female						
VG or excellent if age≤69					-0.070	-1.86
VG or excellent if 69<age<72					0.007	0.08
VG or excellent if age≥72					0.016	0.35
Fair or poor if age≤69					-0.017	-0.31
Fair or poor if 69<age<72					-0.045	-0.37
Fair or poor if age≥72					-0.027	-0.49
Intercept	**-1.693**	**-16.18**	**-1.546**	**-13.12**	**-2.177**	**-6.07**
number of observations	25610		25610		25610	
Wald chi2(2)	5260.4		5305.9		5604.8	
Prob > chi2	0		0		0	
Pseudo R2	0.1871		0.189		0.221	

The results in Table 3-2 highlight two conclusions. First, the bottom panel shows that households in both age intervals with PRA assets in the top quintile are more likely than households in the bottom quintle to make withdrawals. For both age groups and for retirees as well as non-retirees the difference in PRA assets between the top and bottom quintiles is striking. The average PRA balance is between $5,000 and $8,000 in the lowest quintile and over $300,000 in the top quintile.

Second, the top two panels show that, holding PRA assets constant, the difference between the withdrawal rates of the low- and high-percentile attribute households are related to age and, to a lesser extent, retirement status. For households in the younger age range who are not retired the estimated withdrawal probability for the 10th percentile group is over four times as high as that for the 90th percentile group (0.183 versus 0.040). For retired households in this age range the difference is also large but the rates are higher for both attribute groups—0.298 versus 0.164. That is, holding PRA assets constant, households who have very limited assets outside their PRA and who are in poor health are more likely to draw on PRA assets before the age at which distributions are required than households who are in good health and who have substantial levels of non-PRA assets. For older households,

however, the differences between the withdrawal rates of the low- and high-percentile group are much smaller. Not surprisingly, once households are required to make distributions, the differences in withdrawal probabilities that appear to be related to household attributes are moderated.

Table 3-2. Estimated probability of making a withdrawal, for selected attributes.

Attributes and predicted probability	**60-69**	**60-69**	**72-85**	**72-85**
		Age		
		Not retired		
Marital status	Single Male.	Married	Single Male	Married
PRA balance	mean	mean	mean	mean
Earned income	10th pctile	90th pctile	10th pctile	90th pctile
Annuity income	0	0	0	0
Housing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Nonhousing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Health	Fair-Poor	Ex-VG	Fair-Poor	Ex-VG
Probability	**0.183**	**0.040**	**0.535**	**0.523**
		Retired		
Marital status	Single Male	Married	Single Male	Married
PRA balance	mean	mean	mean	mean
Earned income	0	0	0	0
Annuity income	10th pctile	90th pctile	10th pctile	90th pctile
Housing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Nonhousing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Health	Fair-Poor	Ex-VG	Fair-Poor	Ex-VG
Probability	**0.298**	**0.164**	**0.614**	**0.682**
Actual means by PRA quintile				
		Not retired		
PRA balance quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile
PRA balance	**$5,579**	**$356,448**	**$6,519**	**$313,958**
Probability	**0.066**	**0.095**	**0.548**	**0.746**
		Retired		
PRA balance quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile
PRA balance	**$7,674**	**$375,764**	**$5,492**	**$386,083**
Probability	**0.144**	**0.339**	**0.408**	**0.663**

4. PRA Withdrawal Percentages

Much of the interest in the pattern of withdrawals from PRAs arises from concern that households will draw down their retirement account balances before retirement, or early in their retirement years, and then reach their later retirement years with very limited resources. To address this concern, we now consider the share of assets that are withdrawn from PRAs by those who make withdrawals. This information complements the evidence in the last section, which suggested that many households with PRAs do not begin to make withdrawals from these accounts until they are

required to do so. Those findings suggest that at least a substantial share of households with PRAs are maintaining or growing their PRA balances through the early years of retirement.

Figure 4-1 shows the percent of total PRA balances withdrawn by age for all PRA account holders in our SIPP sample. This figure, like Figure 3-2, pools data from the years 1997, 1998, 1999, 2001, 2002, 2004, 2005, 2009, and 2010. This figure shows the rate at which PRA assets are being withdrawn from the retirement saving system. The percent of balances withdrawn is calculated as the ratio of average withdrawals to the average initial asset balance. It is equivalent to the sum of withdrawals made by all households divided by the sum of initial balances. Before age 70, the overall rate of withdrawal averages about 1.9 percent per year. In most years, the average real rate of return earned on PRA balances would exceed this value, so the pool of PRA assets would grow even in the absence of new contributions. After age 70, the average withdrawal rate is 5.8 percent. In some historical periods, this rate would also fall below the average real return on assets held in PRAs. Since the period we examine, 1997 until 2010, is a period of relatively favorable asset market returns -- even with the sharp decline in stock prices in 2001 and 2008/9, the arithmetic average return on a 50/50 portfolio of large company stocks and intermediate bonds over this period is 7.04% -- our estimated withdrawal rates are consistent with the findings in Figure 1-1 of rising real PRA balances even after the age at which required minimum distributions begin.

Figure 4-2 compares the annualized percent withdrawn based on SIPP data for 2009 and 2010 with that based on HRS data for the same period. Recall that the SIPP data include withdrawals from 401(k), 403(b), thrift plans, IRAs and Keoghs, but the HRS data only include withdrawals from IRAs and Keoghs. To make the HRS and SIPP withdrawals consistent, we have divided the HRS percent withdrawn by two to create an estimate of the annual withdrawal rate. We compare this to the average of SIPP withdrawal rates in 2009 and 2010. The two series show a similar pattern, although the percent withdrawn in the HRS is slightly higher before age 70 than that in the SIPP – 1.9 versus 1.6 percent. After age 70, the average percent withdrawn in the HRS is slightly lower than in the SIPP, 4.0 versus 5.0. This figure suggests that the key conclusion from the two data sets for the 2009 to 2010 period is similar to that from the SIPP data for all years in Figure 4-1.

Figure 4-1. The percent of PRA balances withdrawn by age, SIPP data for 1997 to 2010

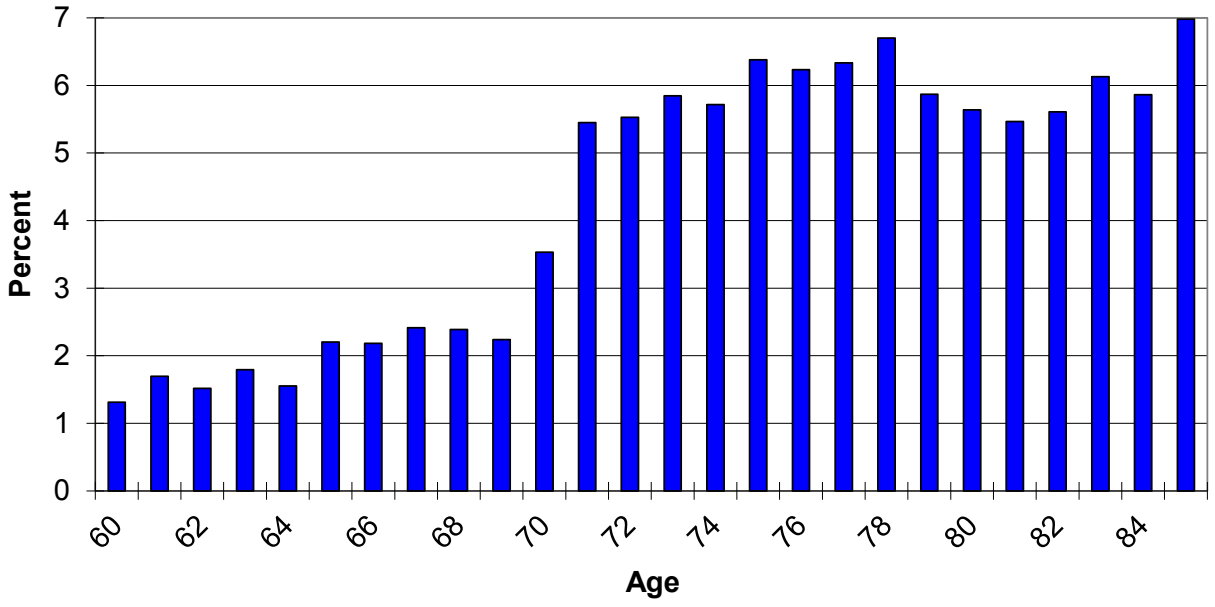
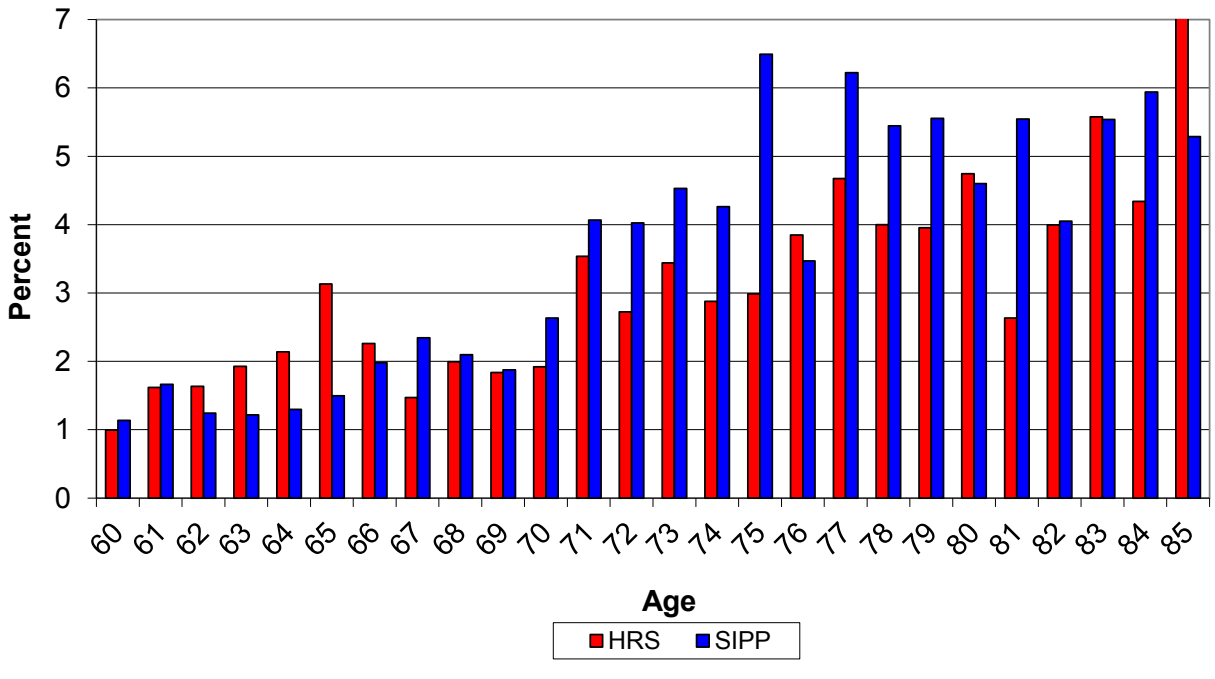


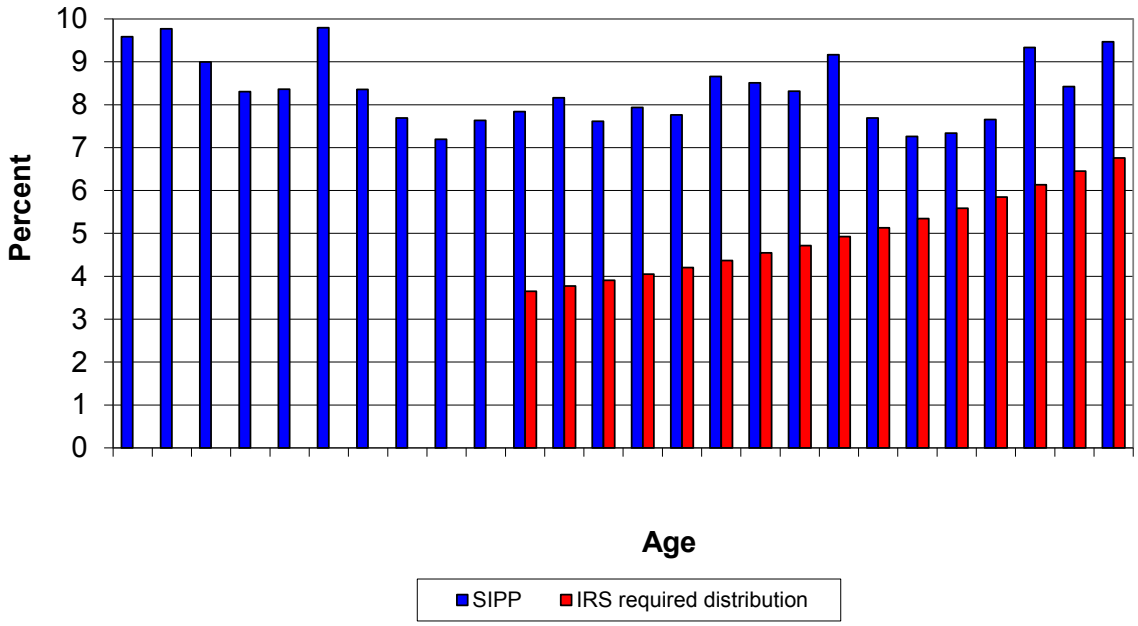
Figure 4-2. The percent of PRA balances withdrawn annually, HRS and SIPP, 2009 & 2010



The data in Figures 4-1 and 4-2 describe aggregate withdrawal rates from the PRA system, but they do not indicate the withdrawal rate among households making a withdrawal. Particularly before age 70 ½, when a small fraction of households with PRAs are making withdrawals, these two rates can differ substantially. Figure 4-3 shows the average percentage of the PRA balance withdrawn for households making a withdrawal, calculated as the ratio of the average amount withdrawn to the average initial balance for the set of households making withdrawals. The average withdrawal conditional on a withdrawal averages 8.6 percent of the account balance for ages 60 to 69, 8.2 percent for ages 70 to 79 and 8.2 percent for ages 80 to 85.

The owner of a traditional IRA or a 401(k) account must take an RMD by April 1st of the year following the year in which he or she turns 70 ½. The RMD is obtained by dividing the account balance by an applicable distribution period taken from the Uniform Lifetime Table published by the IRS. For example, for an unmarried person age 72 or for a married person age 72 whose spouse is not more than 10 years younger, the distribution period was 25.6 years in 2006. Thus the required minimum distribution is 1/25.6 = 3.9 percent of the IRA balance in that year. By age 80 the required minimum distribution is 5.3 percent and at age 90 it is 8.8 percent. These required minimum withdrawal rates are shown in Figure 4-3. It is clear that for households that make withdrawals, the average withdrawal after age 70 ½ exceeds the required RMD percentage

Figure 4-3. Percent of PRA assets withdrawn for households who make a withdrawal (1997-2010) and the IRS required distribution (in 2006), by age



We now consider the relationship between household attributes and the percent of the PRA balance withdrawn, conditional on a withdrawal. We emphasize the relationship between the PRA balance, household age, and the proportion withdrawn. We investigate these relationships to shed light on the possibility that modest rates of PRA withdrawal for the population at large conceal much higher rates for some groups of households. We model this relationship as:

$$(2)\quad W_i = \left(Z_i\delta\right) B_i^{1+\sum \beta AGEcategory} + \eta_i$$

where W_i represents assets withdrawn and B_i the household's pre-withdrawal PRA balance. This specification allows the fraction of assets withdrawn, W_i/B_i, to vary with B_i and for the percentage of assets withdrawn to be proportional to a linear function of household attributes, $Z_i\delta$. The specification also allows the elasticity of the withdrawal rate with respect to the account balance to vary by age. We consider four age categories: 60 to 69, 70 to 71, 72 to 75, and 76 to 85. We estimate (2) by nonlinear least squares. We estimate (2) rather than the corresponding linear specification in the logarithm of the withdrawal rate, $\ln(W_i/B_i)$, because the fit of (2) was better than that of the log-linear model.

Table 4-1 reports estimates of the model described in (2). The first column shows results with only age and cohort indicator variables as explanatory variables in the set of Z_i variables, and with age categories in the exponential term for B_i. The estimates in the second column expand the specification to include all of the other explanatory variables analyzed in previous sections as part of Z_i. The results in the first column indicate that at a given age, households in older cohorts withdraw a larger proportion of their PRA balances conditional on making a withdrawal. The results in the second column indicate that some of the other household attributes have statistically significant effects on the proportion of PRA balances withdrawn. Earned income and annuity income are negatively related to the proportion withdrawn, but only three of the six estimated effects are statistically significant. Housing and non-housing wealth are positively related to the withdrawal proportion in all age intervals but only the housing wealth effects are statistically significant. Being retired is associated with higher withdrawal rates for the two younger age groups, but marital status and most of the health status indicators do not have statistically significant effects on the proportion of the PRA withdrawn. The elasticity of the withdrawal (W) with respect to the PRA balance is 0.40 in the 60 to 69 age range, 1.096 in the 70 to 71 range, 1.092 in the 72 to 75 range, and 1.103 in the 76 to 85 age range.

Table 4-1 Non-linear least squares estimates of the proportion of balances withdrawn for households making withdrawals, households age 60 to 85

Variable	(1) Coef	(1) Z-score	(2) Coef	(2) Z-score	Variable	(1) Coef	(1) Z-score	(2) Coef	(2) Z-score
Determinants of α									
spline in age					*health status - single persons*				
Age≤69	**-0.022**	**-3.88**	**-0.029**	**-4.19**	VG or excellent if age≤69			**0.135**	**2.20**
69<age≤71	**-0.050**	**-2.00**	-0.008	-0.22	VG or excellent if 69<age<72			-0.057	-0.93
Age>71	**-0.008**	**-1.98**	-0.008	-1.65	VG or excellent if age≥72			**0.065**	**2.23**
cohort effects					Fair or poor if age≤69			**0.216**	**2.56**
Age 51 in 1997	0.014	0.21	-0.013	-0.17	Fair or poor if 69<age<72			0.124	1.06
Age 54 in 1997	0.079	1.26	0.052	0.67	Fair or poor if age≥72			-0.024	-0.66
Age 57 in 1997	0.070	1.11	0.057	0.75	*health status - married male*				
Age 60 in 1997	**0.128**	**2.01**	0.087	1.12	VG or excellent if age≤69			**0.136**	**2.73**
Age 63 in 1997	0.100	1.58	0.075	0.97	VG or excellent if 69<age<72			-0.034	-0.49
Age 66 in 1997	**0.166**	**2.54**	0.147	1.87	VG or excellent if age≥72			0.006	0.19
Age 69 in 1997	**0.176**	**2.63**	**0.168**	**2.08**	Fair or poor if age≤69			0.034	0.53
Age 72 in 1997	**0.164**	**2.47**	**0.159**	**1.99**	Fair or poor if 69<age<72			-0.101	-1.14
Age 75 in 1997	**0.172**	**2.49**	**0.190**	**2.31**	Fair or poor if age≥72			-0.037	-1.00
Age 78 in 1997	**0.279**	**3.40**	**0.301**	**3.10**	*health status - married female*				
Age 81 in 1997	**0.198**	**2.35**	**0.214**	**2.19**	VG or excellent if age≤69			-0.037	-0.74
Age 84 in 1997	0.161	1.84	0.167	1.47	VG or excellent if 69<age<72			0.017	0.25
self-reported retirement status					VG or excellent if age≥72			0.036	1.22
retired if age≤69			**0.130**	**2.74**	Fair or poor if age≤69			-0.028	-0.33
retired if 69<age<72			**0.118**	**2.02**	Fair or poor if 69<age<72			0.059	0.45
retired if age≥72			0.010	0.23	Fair or poor if age≥72			0.022	0.63
marital status					Intercept	**1.785**	**5.10**	**2.087**	**4.90**
Single male if age≤69			0.065	1.18	**Determinants of β**				
Single male if 69<age<72			0.000	0.00	β (age 60-69)	**-0.600**	**-22.25**	-0.676	-26.02
Single male if age≥72			-0.015	-0.54	β (age 70-71)	**0.096**	**2.31**	0.077	1.26
Married if age≤69			**0.127**	**2.00**	β (age 72-75)	**0.092**	**2.24**	0.156	3.20
Married if 69<age<72			0.145	1.45	β (age 76-85)	**0.103**	**2.36**	0.144	2.94
Married if age≥72			0.045	1.29					
income sources (in 10,000s)					number of observations	9,533		9,533	
Earned income if age≤69			**-0.009**	**-2.31**	RMSE	1.5713		1.5475	
Earned income if 69<age<72			**-0.021**	**-2.37**					
Earned income if age≥72			-0.006	-1.62					
Annuity income if age≤69			-0.009	-0.89					
Annuity income if 69<age<72			**-0.043**	**-2.89**					
Annuity income if age≥72			0.002	0.22					
wealth (in 10,000's)									
Housing wealth if age≤69			**0.004**	**2.21**					
Housing wealth if 69<age<72			**0.008**	**2.86**					
Housing wealth if age≥72			**0.003**	**3.05**					
Nonhousing wealth if age≤69			0.001	1.32					
Nonhousing wealth if 69<age<72			0.002	1.21					
Nonhousing wealth if age≥72			0.000	0.95					

Table 4-2 reports the fitted value of the proportion of assets withdrawn (W/B) for households with selected attributes. The format is the same as that in Table 3-2, with the top panel showing the percent withdrawn for sets of household attributes conditional on an average account balance and the bottom panel showing the percent withdrawn for the top and bottom quintiles of the distribution of PRA assets. The table shows two estimates of the predicted proportion of assets withdrawn: the mean of the ratio of withdrawals (W) to balances (B), and the ratio of the mean amount withdrawn to the mean balance.[4] For households in the younger age group, whether retired or not,

[4] The mean ratio is calculated using the predicted W and actual B for each household.

the proportion withdrawn is slightly greater for those with high-percentile attributes. For the older age group the proportion withdrawn is considerably higher than for those with low-quintile attributes. One potential explanation of this finding is that it is due to reporting differences rather than behavioral differences. It is possible that households with higher income and larger holdings of assets outside their tax-deferred PRAs are more aware of their PRA withdrawal activity, and consequently report this activity with higher probability.

The results in the bottom panel suggest that the PRA balance is a key determinant of the proportion of assets withdrawn. For households in the 60 to 69 age range the predicted proportion of assets withdrawn for those in the bottom quintile is about 32 percent, compared to about 5 to 6 percent for those in the top quintile. For households in the older age range, the predicted proportion of assets withdrawn ranges from 19 to 23 percent in the bottom quintile, to a bit less than 6 percent in the top quintile.

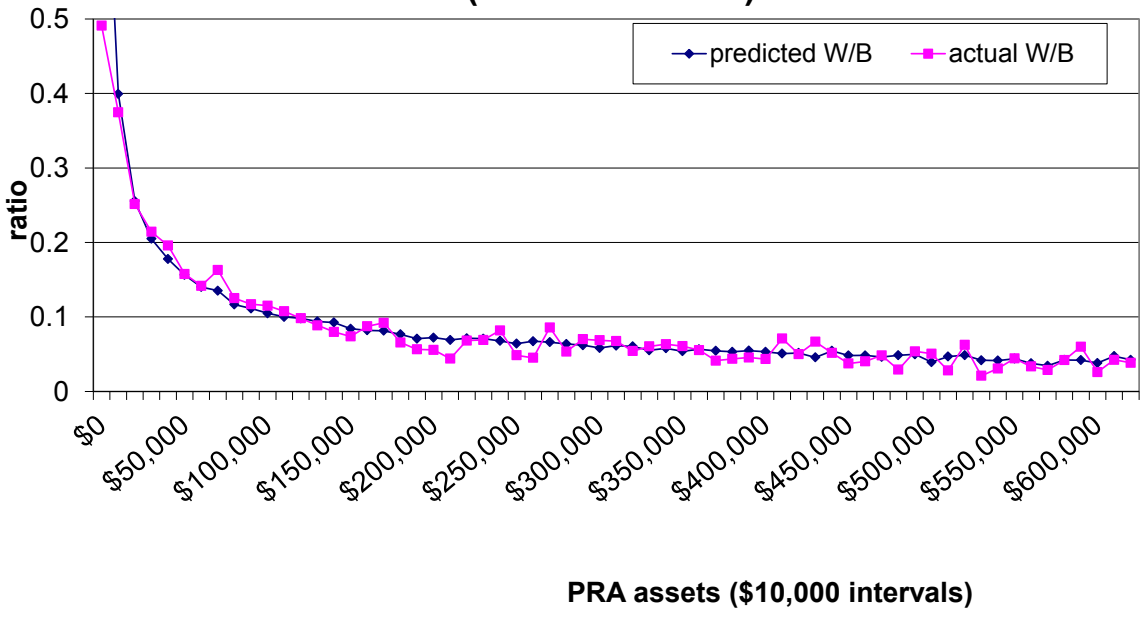
Table 4-2. Proportion of assets withdrawn given a withdrawal, for selected attritubes.

Attributes and predicted proportion withdrawn (W/B)	**60-69**	**60-69**	**72-85**	**72-85**
		Age		
		Not retired		
Marital status	Single Male.	Married	Single Male	Married
Earned income	10th pctile	90th pctile	10th pctile	90th pctile
Annuity income	0	0	0	0
Housing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Nonhousing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Health	Fair-Poor	Ex-VG	Fair-Poor	Ex-VG
Mean W/B	0.237	0.253	0.145	0.276
Ratio of mean W to mean B	0.082	0.087	0.061	0.118
		Retired		
Marital status	Single Male	Married	Single Male	Married
Earned income	0	0	0	0
Annuity income	10th pctile	90th pctile	10th pctile	90th pctile
Housing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Nonhousing wealth	10th pctile	90th pctile	10th pctile	90th pctile
Health	Fair-Poor	Ex-VG	Fair-Poor	Ex-VG
Mean W/B	0.290	0.309	0.151	0.289
Ratio of mean W to mean B	0.100	0.107	0.064	0.124
Actual means by PRA quintile				
		Not retired		
PRA balance (B) quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile
Mean W	$4,046	$13,224	$2,646	$17,510
Mean B	$8,684	$346,998	$8,431	$332,693
Mean(W/B)	0.486	0.043	0.350	0.054
Ratio of means	0.466	0.038	0.314	0.053
		Retired		
PRA balance (B) quintile	Bottom quintile	Top quintile	Bottom quintile	Top quintile
Mean W	$5,190	$21,213	$6,059	$22,519
Mean B	$12,878	$403,145	$14,798	$411,831
Mean(W/B)	0.460	0.057	0.466	0.059
Ratio of means	0.403	0.053	0.409	0.055

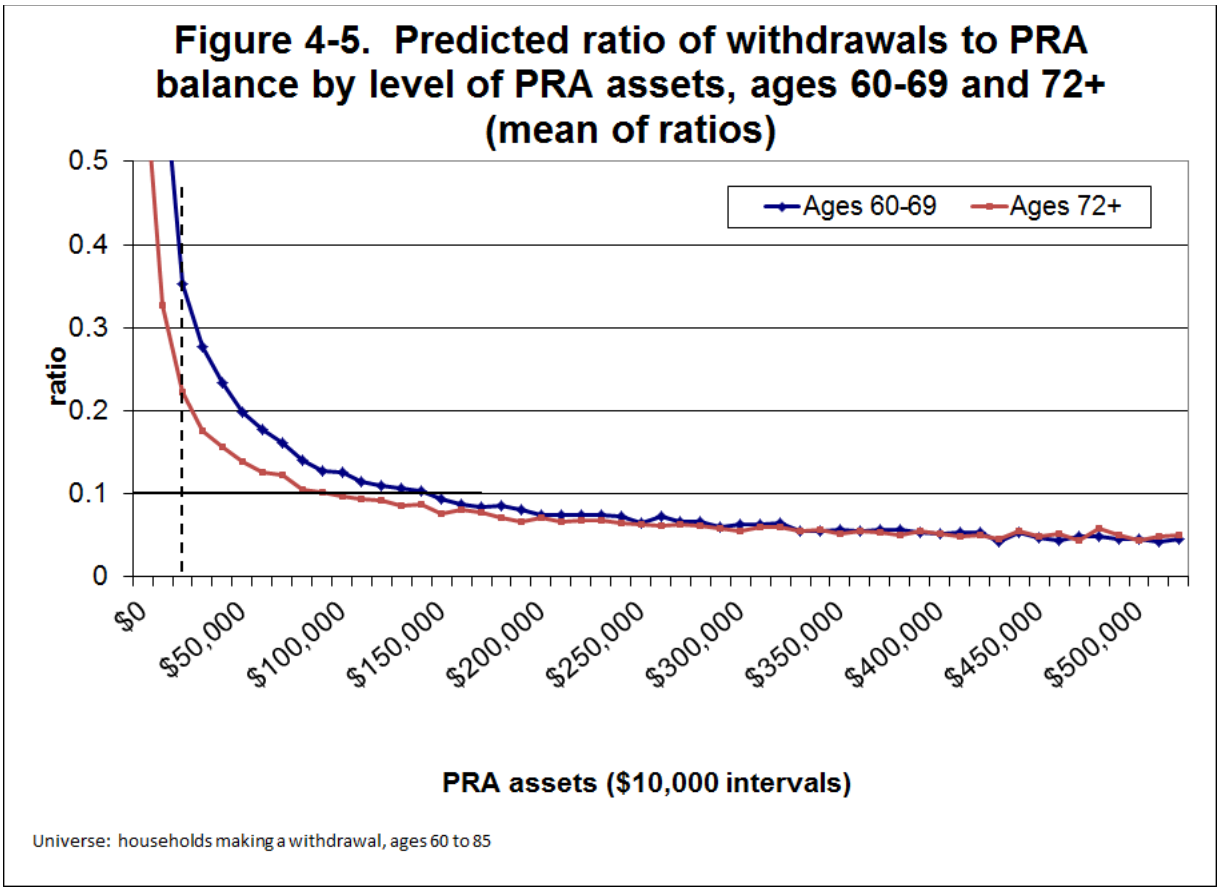
The results in Table 4-1 suggest that age is an important determinant of the percentage of the PRA balance withdrawn, and that the PRA balance itself is also an important influence on withdrawals. We explore the interaction of these two effects in two figures. Figure 4-4 shows the average predicted and actual values of W/B for each $10,000 interval of the distribution of PRA assets. The figure suggests two conclusions. First, the model fits the actual data on withdrawals reasonably well. Second, the withdrawal proportion increases very rapidly as PRA assets decline below $50,000—going from an average of about six percent when the PRA balance is $250,000 or greater, to about ten percent at a PRA balance of $100,000, to over twenty-five percent at a PRA balance below $20,000.

Figure 4-5 shows the relationship between the PRA balance and the predicted withdrawal proportion for the 60 to 69 and the "72 and older" age groups. For households with PRA assets over $200,000, the percentage of assets withdrawn does not vary much with age for either age group. At lower PRA levels, however, there is a large difference as can be seen by the vertical distance between the two profiles at low levels of B. For example, on average, households aged 60 to 69 with PRA assets between $20,000 and $30,000 withdraw about 35 percent of their PRA assets each year. Households with the same level of PRA assets in the 72 and older age group average withdrawals equal to only 22 percent of their assets. To provide some context for this finding, households in the 60 to 69 age group are not predicted to withdraw at least 10 percent of their assets until they have assets of $140,000 or more.

Figure 4-4. Predicted and actual ratio of withdrawals (W) to PRA balance (B) by PRA balance (mean of ratios)



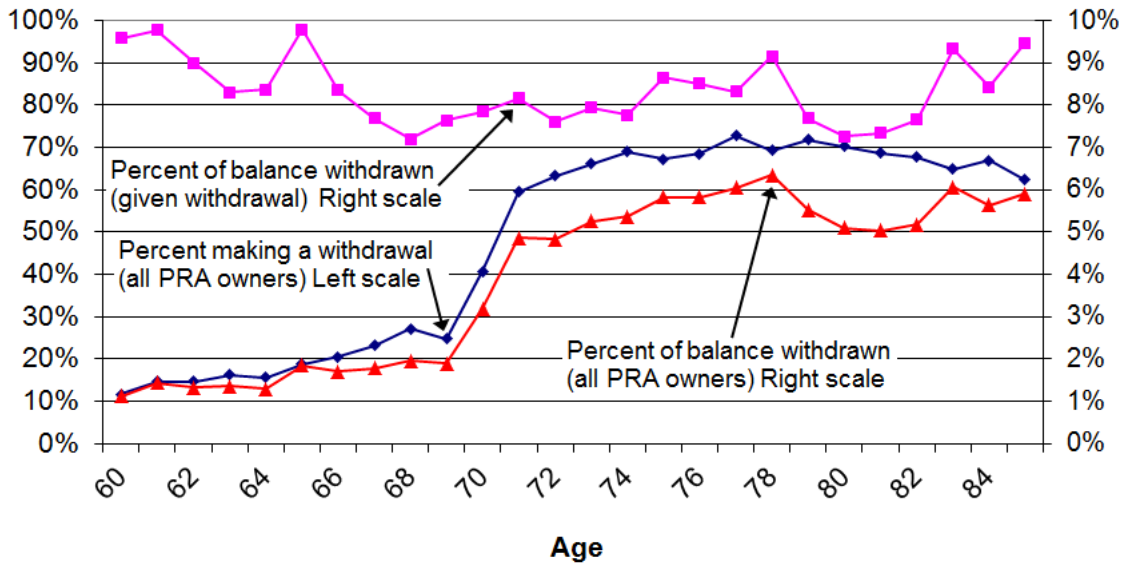
Universe: households making a withdrawal, ages 60 to 85



5. Household Heterogeneity: The Distribution of Withdrawal Rates

Our analysis so far has used simple probit models to describe how various factors affect the probability that a household withdraws assets from a PRA, and has demonstrated that a number of household attributes are correlated with withdrawal rates. We have not, however, characterized the heterogeneity in household withdrawal behavior. To do that, we need to characterize differences in both the probability of a withdrawal conditional on PRA ownership and in the proportion of the PRA that is withdrawn, conditional on a withdrawal. These two proportions together determine the distribution across households of the proportion of PRA balances withdrawn – a distribution with many entries at zero for younger households.

Figure 5-1. Percent making a withdrawal, percent of balance withdraw given withdraw, and percent withdrawn for all PRA owners



Before considering this distribution, we summarize the average patterns of withdrawals at different ages. Figure 5-1 pools data on households of various ages in all cohorts. It shows that the average percentage of households who own a PRA who make a withdrawal increases from 11.4 percent at age 60 to 24.8 percent by age 69. This percentage jumps to over 60 percent by age 71, when the age of the household head exceeds the age at which RMDs must begin. The percentage of assets withdrawn by households that make a withdrawal is about 9.6 percent at age 60. It declines to between seven and eight percent between ages 68 and 75, and it becomes somewhat more variable after that age, falling below eight percent at many ages in the late 70s and early 80s. The average percentage of all PRA assets withdrawn, which is the product of the two foregoing series, is about 1.1 percent at age 60. It rises to about 1.9 percent by age 69, then jumps to about five percent by age 71 and fluctuates between 5 and 6 percent through age 85.

Figures 5-2 and 5-3 describe the heterogeneity in withdrawal percentages for households with heads between the ages of 60 to 69, and over the age of 72, respectively. Both figures show the distribution of households by the percentage of their PRA balance that they withdraw. For households aged 60 to 69, i.e. before the age at which required minimum distributions must begin, withdrawals of a large proportion of the PRA balance are rare. The vertical lines in Figure 5-2 indicate that about 82 percent of households make no withdrawals, and that 89 percent of households make an annual withdrawal of less than five percent from their PRA. Only 8 percent of households withdraw more than ten percent of their PRA assets. Figure 5-

2 shows that there is a small but identifiable group of households that make withdrawals equal to their account balance -- they are essentially closing their PRA.

Figure 5-3 shows that for households older than 71, after RMDs begin for the household head, most withdrawals are still modest. The percentage of households making large withdrawals from their PRAs is substantially greater for this group, however, than for the younger group. The vertical lines in Figure 5-3 indicate that 59 percent of households withdraw less than five percent of their PRA balances and 76 percent withdraw less than 10 percent. Nearly a quarter of the households in this older group, however, withdraw more than ten percent of their PRA, and 14 percent withdraw more than 20 percent. Our results from the previous section suggest that the households withdrawing large fractions of their PRA balances tend to have low balances. Some households may withdraw a large proportion of PRA assets because of special circumstances, such as illness of a spouse or entry into a nursing home. Understanding the correlates of large withdrawals is an important topic for future study.

Figure 5-2. Distribution of percent of PRA balances withdrawn in a year, all households age 60 to 69 with a PRA account

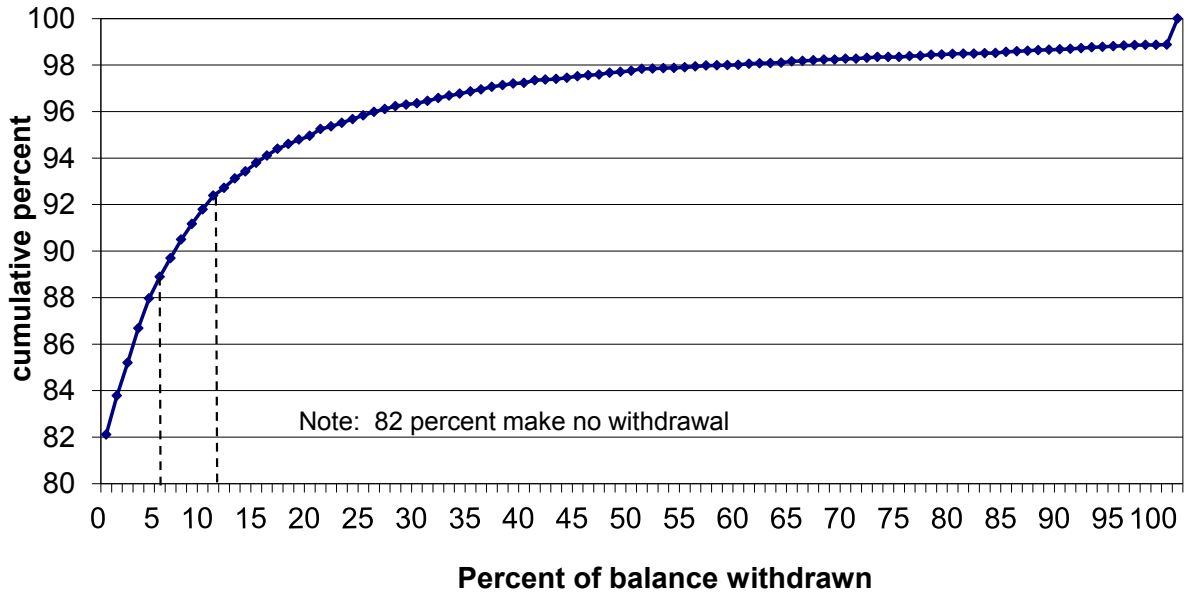
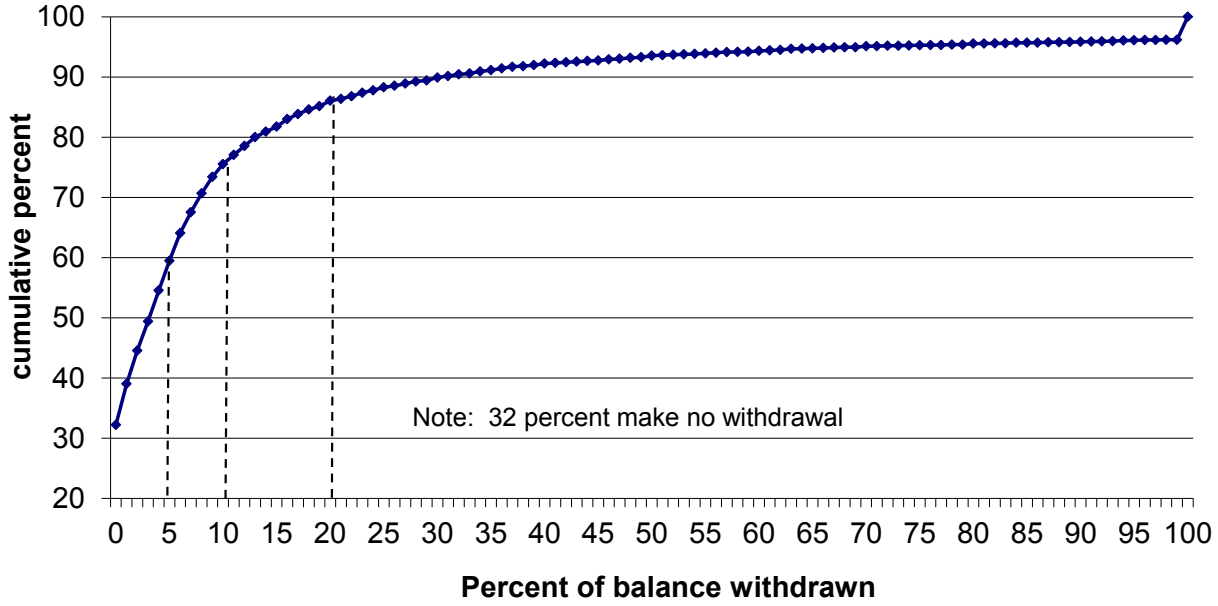


Figure 5-3. Distribution of percent of PRA balances withdrawn, all households age 72 to 85 with a PRA account



6. Conclusions and Future Directions

Assets in personal retirement accounts are a large component of financial wealth for a significant fraction of households, accounting for almost one-quarter of non-annuity wealth and almost forty percent of wealth excluding annuities and housing in 2010. To date, few of these PRA assets have been annuitized, so the decision to withdraw PRA assets is discretionary through age 70 1/2. After that age, households must make required minimum distributions (RMDs); they may choose to withdraw more than is legally required. The pattern of observed PRA withdrawal patterns is of particular interest because there have been a number of recent proposals to either encourage full or partial annuitization of PRA balances. Proposals to encourage annuitization, as well as Shoven and Slavov's (2011) suggestion that households should "spend down" their financial assets, including PRA balances, while delaying Social Security benefit claiming, would result in increased annuity income, but could also leave households with lower PRA asset balances in the later years of retirement.

We use data from the SIPP and HRS to investigate the actual pattern of withdrawals from PRAs. We find that households typically tend to conserve PRA assets. We find a modest rate of PRA withdrawal prior to the age at which households are required to take RMDs. The rate of distributions rises sharply after age 70 ½, when minimum distributions are required. The sharp increase in withdrawals when distributions become mandatory suggests that many households in their early 70s would not make withdrawals if it were not for the RMD rules. This supports the view

that changes in the age at which RMDs are required could have substantial effects on withdrawal patterns and on the tax revenue collected from such withdrawals.

The low rate of withdrawals from PRAs during our sample period, 1997-2010, combined with investment returns to PRA assets and contributions by some still-employed PRA-owning households to generate an upward-sloping pattern of average PRA balances by age. In our sample, average PRA balances continue to grow through at least age 85, although the rate of growth is slower at older than at younger ages.

While average withdrawal rates are low, there is substantial heterogeneity across households, and some withdraw a significant proportion of PRA assets. Among households headed by someone between the ages of 60 and 69, about eleven percent of PRA owners make an annual withdrawal of five percent or more of their PRA assets, and about seven percent withdraw more than ten percent of assets. At ages 72 and older, after RMDs take effect, 59 percent of households withdraw five percent or less of their PRA balance in a typical year. Seventy-six percent withdraw 10 or less, while at the other extreme, fifteen percent withdraw more than twenty percent of their balance.

There are substantial differences not just in withdrawal rates but also in PRA balances across households. While we estimate that only eight percent of households in the lowest decile of non-PRA wealth, income, and health status have a PRA as they approach retirement, about 80 percent of households in the top decile of these measures have such accounts. We find that even after controlling for other assets, households in poor health are less likely than those in good health to have a PRA. We find that among households approaching retirement, whether a withdrawal is made varies greatly with the PRA balance; households with higher balances are more likely to make a withdrawal. Among those who make a withdrawal, the PRA balance is the most important determinant of the proportion of assets withdrawn.

We note two important limitations of our current analysis. First, withdrawals from PRAs do not necessarily translate into consumption: households may simply re-direct their assets from PRAs to other investment accounts. While there are substantial tax-based arguments for households prior to age 70 ½ to draw down non-PRA assets prior to PRA assets to fund consumption, whether households follow these rules is not clear. After age 70 ½, when households face RMDs, it is more likely that some assets that are withdrawn from PRAs are transferred to other investment accounts. Integrating the analysis of PRA withdrawals with a broader investigation of household wealth at older ages is a key research priority.

Second, our analysis excludes individuals who die between waves of the SIPP. Whether death-induced withdrawals should be aggregated with other withdrawals from PRAs depends on the purpose for which one is calculating the withdrawal rate. If the goal is to understand how PRAs are serving the retirement income needs of long-lived households, it seems appropriate to exclude those who die at an early age from the analysis. On the other hand, if the goal is to understand how long assets are held in the PRA system, which might be relevant for some types of tax analysis, then it is more

important to recognize that death can be an important factor in generating withdrawals from the retirement saving system.

One of the most important research priorities for future analysis is integrating our analysis of withdrawal patterns with explanations of why households choose to save. Our evidence is consistent with the view that most households conserve PRA assets for a "rainy day." Several other studies have reached a similar conclusion with respect to home equity, which tended to be held until a shock to family status occurred. Households may want to preserve their PRA funds for contingences such as entry to a nursing home or other large health care expenditures. Marshall, McGarry, and Skinner (2011) find that out-of-pocket health care costs when calculated based on exhaustive use of all information in the HRS are much larger than costs based on direct responses to questions about expenditures. They estimate that at the 95 percentile health care costs are about $100,000 per person over a five-year period. EBRI (2009) estimates that men approaching retirement will need anywhere from $68,000 to $173,000 in assets to have a 50-50 chance of covering insurance premiums and out-of-pocket medical expenses in retirement and $134,000 to $378,000 if they want a 90 percent chance of covering these expenses. Asset reserves needed to fund medical expenses are even higher for women. Poterba, Venti, and Wise (2010) find that the full cost of poor health, as measured by its correlation with the decline in household assets, is greater than these out-of-pocket medical expenses. The role of PRA assets in supporting precautionary saving objectives warrants further study.

Precautionary saving motives naturally raise two other related issues: the adequacy of retirement saving, and the role of annuitization in protecting households against longevity risk. With respect to the former issue, if households are holding PRAs and other assets to self-insure against late-life health shocks, many households that do not suffer major health shocks may die holding substantial asset balances, and appear on some metrics to have "over-saved" for retirement. In the presence of self-insurance, however, this interpretation may be misplaced. Our results do not inform this issue, or the question of whether households are drawing down their wealth in retirement at the appropriate rate. But they could provide clues for further investigation.

Similarly, if households are concerned about late-life expenditure risks, they may choose not to annuitize all or even most of their financial wealth at retirement. The lack of annuitization of most PRA assets has attracted attention from researchers and policy-makers, but the optimal degree of annuitization depends on the risks that households are attempting to insure against, and the set of assets—including housing equity—that households can draw on in the event of adverse outcomes. Having some liquid assets to draw on in an emergency is valuable, and for many households PRA assets are the single largest source of liquid assets. The role of PRA assets in supporting the diverse array of potential financial needs in retirement is a topic that warrants further attention, particularly as the maturing defined contribution pension system makes PRA assets a more important component of retiree wealth.

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