



Do Required Minimum Distribution Rules Matter? The Effect of the 2009 Holiday on Retirement Plan Distributions



Jeffrey R. Brown^{a,*}, James Poterba^b, David P. Richardson^c

^a University of Illinois and NBER

^b MIT and NBER

^c TIAA Institute

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ABSTRACT

This paper investigates how the one-year suspension in 2009 of the Required Minimum Distribution (RMD) rules associated with qualified retirement plans affected the distribution elections of participants at a large retirement services provider. Roughly one third of those who were affected by the RMD rules in 2008 discontinued their distributions in 2009. The suspension probabilities of those for whom 2008 distributions equaled the RMD amount, a plausible indication that the RMD rules were a binding constraint, were not very different from the corresponding probabilities of those for whom 2008 distributions exceeded the RMD amount. Participants who died within six years of the distribution holiday were less likely to suspend than those who were still alive in late 2015, suggesting that RMD rules are more likely to bind for those with longer retirement horizons. The probability of suspension declined substantially with age and rose modestly with financial resources. Individuals taking monthly distributions were less likely to suspend distributions than those taking annual distributions, particularly at higher wealth levels, perhaps because they use their distributions to finance monthly consumption. The findings offer insights on the relationship between participant attributes and distribution behavior, bear on the choice between competing models of saver behavior, and provide some evidence on the revenue consequences of changing RMD rules.

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Traditional qualified defined contribution (DC) retirement plans in the United States, such as Individual Retirement Accounts (IRAs) and employer-sponsored 401(k) and 403(b) plans, provide incentives for individuals to save while working in order to help finance a reasonable living standard in retirement. These plans allow workers to defer taxation of contributions and accruing investment income within the qualified plan during their working lives; distributions from these plans are taxed as ordinary income. They effectively offer consumption tax treatment of retirement saving within an income tax structure.

There is a long regulatory tradition of limiting participants' capacity to use qualified plans as a means of avoiding taxation on assets that are not needed to support retirement consumption. The tension between the goals of promoting retirement saving and limiting revenue losses is particularly evident in the structure of the Required Minimum Distribution (RMD) rules that apply to qualified plans. These rules require plan participants to withdraw a minimum percentage of their account balance each year once they reach a specified age.

Warshawsky (1998) explains that RMD rules were first introduced in 1962, when Congress established formal distribution requirements for Keogh plans, qualified plans for self-employed individuals. These

rules require plan owners to begin taking distributions by the later of the year in which they retire or the year in which they reach age 70½. The factors that led to the choice of age 70½ in the 1962 legislation are not clear. Although there have been significant increases in life expectancy since 1962, 70½ remains the trigger age for RMDs.

RMD rules now apply to most qualified retirement savings plans, including 401(k) and 403(b) plans, IRAs, and many other defined contribution plans. These rules limit the revenue cost of tax deferral and help to focus the tax subsidy on accumulations for retirement. RMD rules also apply to Roth 401(k) and 403(b) accounts, although they do not apply to Roth IRAs. Contributions to Roth-style accounts are made with after-tax rather than pre-tax income, and Roth distributions are not taxed. Saving in Roth accounts receives consumption tax treatment, but the tax liability coincides with the date of contribution rather than the date of distribution.

RMD regulations are part of a large set of requirements that retirement plans must meet in order to ensure that plan income is not taxable to participants. There are also limits on the amount that participants can contribute to these plans each year, restrictions on how and when funds can be withdrawn without paying penalties, and rules governing the share of total plan contributions that can go to highly compensated employees. Each of these regulatory parameters can affect the evolution of participant contributions and account balances in qualified plans,

* Corresponding author.

E-mail address: brownjr@illinois.edu (J.R. Brown).

and therefore federal revenues. The magnitude of these revenue effects depends on how plan qualification rules affect participant behavior.

Estimating behavioral responses to changes in these rules is challenging because they change infrequently and the changes are often part of multi-part legislative packages. One policy change that does lend itself to such evaluation took place in 2009. As part of the Worker, Retiree, and Employer Recovery Act of 2008, Congress suspended the RMD rules for one year so that retirees whose DC account balances had been substantially reduced by falling asset prices during the financial crisis could skip one year's required payout. This provision was framed as helping retirees preserve their retirement savings by allowing them to avoid selling assets during the depths of the financial crisis. This justification received some *ex post* validation when equity markets rose sharply in the years following the distribution holiday. The Joint Committee on Taxation (2008) estimated that the RMD holiday would cost \$3.8 billion. This is consistent with a projected decline in distributions of \$19 billion and an average tax rate of 20% on these distributions, or a decline of \$15.2 billion and an average tax rate of 25%.

Aggregate data presented in U.S. Internal Revenue Service (IRS) (2009, 2010, 2011, 2012) offer suggestive evidence on the impact of the distribution holiday. Taxable distributions from IRAs, which are just one, but a significant, class of qualified accounts, declined 16.7% from 2008 to 2009. These distributions totaled \$148 billion in 2007, \$162 billion in 2008, \$135 billion in 2009, and \$194 billion in 2010. The number of participants taking distributions also declined, from 10.7 million in 2007 and 11.3 million in 2008 to 9.7 million in 2009. The number of participants taking distributions rebounded to 12.5 million in 2010. Data from individual tax returns analyzed by Mortenson et al. (2016) suggest a sharper 2009 decline among those who were taking minimum distributions in 2008.

Although these data suggest that the distribution holiday mattered, it is difficult to draw firm conclusions from aggregate data for three reasons. First, the distribution holiday coincided with a sharp decline in asset values and in the account balances of many qualified plan participants. This wealth effect may have affected distribution patterns, and would likely have resulted in a decline in distribution amounts even in the absence of a distribution holiday. Second, the aggregate data may confound the distribution holiday with another policy change that allowed individuals to convert traditional IRA assets to Roth IRAs while deferring half of the associated tax liability for a year. This more-attractive-than-usual tax treatment for conversions may have led some participants with traditional IRAs to convert to Roth IRAs, thereby obviating the need for required distributions in future years. Finally, IRA holders may not be representative of all qualified plan participants, since unlike 401(k) and 403(b) plans, IRAs are not employer-sponsored.

In this paper, we use a combination of administrative records and survey data to examine retirement distribution patterns of participants who were subject to RMD rules prior to 2009, and who were eligible to suspend distributions during the 2009 holiday. We study the participants at the Teachers Insurance and Annuity Association (TIAA), a large provider of retirement income and retirement services for not-for-profit institutions.¹ Roughly one-third of the participants who took required distributions in 2008 suspended their distributions during the 2009 holiday. We examine the consistency of suspension behavior, and the correlation between suspensions and a small set of participant characteristics, with models of retirement wealth accumulation and draw-down. We also conduct an email survey of a sub-sample of these participants to explore underlying motivations for suspending or not suspending distributions.

Our findings provide some of the first participant-level evidence on how RMD rules affect distributions from qualified plans and document the heterogeneity in responses across plan participants. Our analysis may prove useful to policymakers who are considering possible

modifications of the RMD rules. Both the U.S. Departments of Treasury and Labor have expressed interest in promoting increased annuitization of assets within qualified plans. The Department of Labor (2013) released proposed rules to require that DC plans provide income illustrations as well as account balances as part of their quarterly or annual account statements. The U.S. Treasury Department (2014) issued rules that allow qualified plan participants to use up to 25% of their plan balance, up to a limit of \$125,000, to purchase longevity annuities that would not begin payouts until advanced ages, such as 80 or 85. In contrast to the U.S. initiatives, Mercer Consulting (2014) reports that the U.K. has recently reduced the role of annuitization from DC plans. These divergent policy directions underscore the importance of understanding how regulations on distributions affect participant behavior.

The remainder of this paper is divided into five sections. The first describes the RMD rules that usually apply to qualified retirement accounts as well as the 2009 distribution holiday. It also examines how the path of distributions specified by current U.S. regulations compares to the optimal consumption profile for an individual seeking to maximize late-life utility, describes how various individual attributes might affect suspension decisions, and summarizes the small prior literature on how distribution rules affect participant behavior.

Section two describes the data set on qualified plan participants who were taking required distributions in 2008 that underlies this study. It also notes a number of challenges that arise in tracking distribution behavior over time with administrative record data. Section three documents the decline in the number of participants taking distributions between 2008 and 2009, and it reports on our survey of why participants suspended, or did not suspend, their distributions. The results offer some insight on the way participants view RMD rules and the importance of the associated distributions in supporting retirement consumption.

Section four presents estimates of probit models relating suspension decisions to various participant attributes. Participants with higher qualified plan balances were more likely to suspend, as were those who previously were taking their distribution as a single annual payment rather than as a series of monthly payments. Those who survived for at least six years after the distribution holiday were also more likely to suspend, which is consistent with long-horizon individuals being more constrained by RMD rules. There is a brief conclusion.

1. Required Minimum Distribution (RMD) Rules and Retirement Consumption

The RMD rules stipulate that the holder of an IRA or of most other employer-sponsored qualified plans, including 401(k)s and 403(b)s, must begin distributions no later than April 1 of the year following the calendar year in which she turns 70½. For employer-sponsored plans, if the participant is still employed at the sponsoring firm, distributions are not required until the year after the participant's retirement. Roth IRAs, as noted above, are not subject to distribution requirements during the accumulating contributor's lifetime, or during the lifetime of the contributor's spouse when the spouse is the beneficiary of the account. The rules specify that each year's distribution must exceed the participant's account balance at the end of the previous year divided by an "applicable distribution period" that depends on the participant's life expectancy and that of the account's beneficiary as determined using an IRS-provided unisex mortality table. Although the precise methods for calculating RMD amounts have changed occasionally, the RMD amount has always been linked in some way to a measure of average remaining life expectancy. Failure to take minimum distributions triggers an excise tax of 50% of the required, but undistributed, amount. This penalty, which is in addition to the normal tax liability, provides a substantial incentive for participants to comply with the RMD rules.²

¹ Prior to 2016, TIAA was known as TIAA-CREF, the Teachers Insurance and Annuity Association – College Retirement Equity Fund.

² Additional details on the RMD calculations can be found at <http://www.irs.gov/Retirement-Plans/Plan-Participant,-Employee/Retirement-Topics-Required-Minimum-Distributions-%28RMDs%29>.

Table 1
Applicable Distribution Period under Required Minimum Distribution Rules for Married Account Owners with Spousal Beneficiaries and Age Disparity of Less than Ten Years.

| Age | Distribution Period | Required Withdrawal (% of Previous Year-End Balance) |
|-------|---------------------|------------------------------------------------------|
| 70 | 27.4 | 3.65% |
| 71 | 26.5 | 3.77 |
| 75 | 22.9 | 4.37 |
| 80 | 18.7 | 5.35 |
| 85 | 14.8 | 6.76 |
| 90 | 11.4 | 8.77 |
| 95 | 8.6 | 11.63 |
| 100 | 6.3 | 15.87 |
| 105 | 4.5 | 22.22 |
| 110 | 3.1 | 32.26 |
| > 115 | 1.9 | 52.63 |

Source: IRS Publication 590, *Individual Retirement Arrangements*, Appendix C, Table III, and authors' calculations.

Financial services companies that serve as trustees of qualified accounts are required to inform participants of the need to take an RMD and the date by which it must be taken, and they must either specify the amount of the RMD or offer to calculate this amount upon request. This must be done by January 31 of each calendar year for which an RMD is required; see [U.S. Internal Revenue Service \(2003\)](#) for further details. TIAA follows these provisions and offers participants the possibility of selecting a "Minimum Distribution Option" (MDO) that automatically distributes the RMD amount each year.

Table 1 shows the applicable distribution period for what the IRS labels a "uniform lifetime," the remaining lifetime that the account balance must be divided by for unmarried account owners, for married account owners whose beneficiary is a spouse who is no more than ten years younger than the account owner, and for married owners whose spouses are not their beneficiary. For accounts with a spousal beneficiary who is more than ten years younger than the account owner, the RMD rules permit slower draw-down. There is yet another RMD table for beneficiaries of an inherited qualified account.

Table 1 indicates that for a participant who is covered by the uniform lifetime table, the RMD in the first year after turning 70½ is slightly less than 4% of the account balance. This proportion rises as the participant ages, exceeding 5% at age 80, and 15% at age 100.

1.1. RMD Rules vs. Optimal Consumption Profiles

In standard lifecycle models, consumers select their consumption paths to maximize the expected discounted value of lifetime utility.

$$\text{Max} \sum_{t=0}^T \frac{P_t \cdot U(C_t)}{(1+\delta)^t} \quad (1)$$

In this equation, P_t is the cumulative survival probability from time 0 to t , δ is the individual's subjective discount rate, and C_t is the flow of consumption in period t . It is common to assume that preferences exhibit constant relative risk aversion (CRRA):

$$U(C_t) = \frac{(C_t - 1)^{1-\gamma}}{1-\gamma} \quad (2)$$

This maximization is carried out subject to a lifetime budget constraint

$$W = \sum_{t=0}^T \frac{C_t}{(1+r)^t} \quad (3)$$

There may also be constraints that restrict the consumer's ability to transfer resources across periods. Such constraints may arise early in life if it is difficult to borrow against future earnings, or late in life when the present value of Social Security benefits, which cannot be pledged as

collateral, becomes a substantial fraction of wealth. The budget constraint becomes more complex in the presence of qualified retirement accounts that offer a return of r , and taxable brokerage accounts that offer a return of $(1-\tau)r$, where τ is the effective tax rate on capital income. There are ceilings on the amount that can be contributed each period to the higher-return qualified account, as well as floors – RMD rules – on the level of penalty-free withdrawals in some periods.

The optimal consumption path equates the expected discounted marginal utility of consumption at different ages. Except in special cases, this path will not involve equal consumption in all periods. For example, it may be downward sloping if the individual's discount rate exceeds the market rate of interest, if she faces high expected mortality rates, or if she does not have access to actuarially fair annuities. Similarly, the age profile of DC plan withdrawals that is implied by the path of RMDs will only coincide with the optimal consumption path under restrictive conditions. The RMD path need not constrain an account-holder's spending because the retirement plan participant is not required to spend the amount withdrawn from the qualified account. A participant who does not wish to consume the entire RMD amount can invest part of the proceeds, net of tax, in a taxable savings account. RMD rules constrain the fraction of a participant's wealth that can be held in qualified accounts, not their consumption trajectory.

If an individual's desired consumption spending exceeds his income, including any Social Security or defined benefit pension payouts, and if he does not have assets outside his qualified plan that can be used to support consumption, he may withdraw more than the RMD amount specifies. The RMD rules only constrain qualified account holdings for those who would prefer not to withdraw their account balances as quickly as the rules prescribe. RMDs can affect the consumption path of such constrained individuals by changing the marginal return on saving in some periods from r to $r(1-\tau)$, and by reducing lifetime wealth because of the limitation on the share of wealth that can be held in tax-advantaged qualified accounts.

Fig. 1 shows the time path of withdrawals associated with the uniform lifetime RMD rules under the assumption that an account-holder starts with a \$100,000 account balance at age 70½, earns a 5% annual nominal return, and faces a 2.5% annual inflation rate. The real value of distributions rises for more than two decades in this scenario. It begins to decline at age 93, and it falls steeply at older ages. The shape of this profile depends on the assumed real return.

For an individual with no resources other than the qualified account, the optimal consumption path will only equal the path of RMD amounts, which are defined as (beginning of period wealth/remaining life expectancy), when: (i) utility is logarithmic in consumption; (ii) $r = \delta = 0$, and (iii) the participant's expected mortality rates equal those used by the IRS in constructing the RMD rules. [Sun and Webb \(2012\)](#) explore the loss in utility that consumers who did not satisfy these three conditions would face if they set their consumption equal to the RMD payout stream.

Some qualified plan participants, including nearly half of our survey respondents, view RMD rules as a form of implicit guidance with regard to optimal retirement consumption, a signal of how much they can safely withdraw from their qualified plan accounts each year. This view does not recognize that the age structure of RMD payouts is relatively insensitive to changes in the saver's rate of return. The RMD path is only influenced by this return insofar as returns affect the value of the account at different ages that is subject to the RMD requirement. An active literature, illustrated by [Finke et al. \(2013\)](#) and [Pfau \(2010\)](#), examines the performance of various draw-down rules, such as the "4% rule," in various return environments.

While our empirical work does not estimate a model of optimal consumption behavior, it relies on insights from the optimal consumption framework to identify individual attributes that might be associated with higher or lower desired withdrawals from qualified plans. First, subjective mortality expectations can affect a participant's optimal

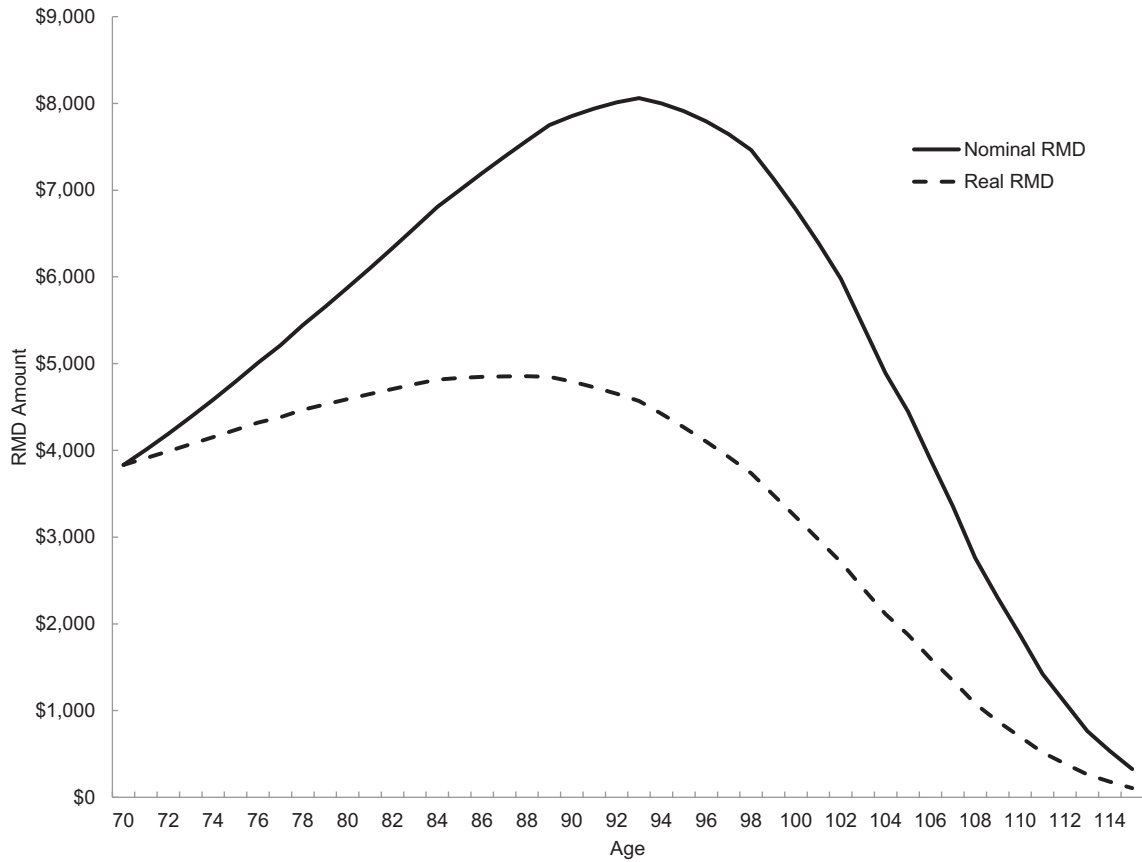


Fig. 1. Nominal and Real Value of Required Minimum Distributions. Calculations assume an initial principal of \$100,000, invested at a nominal 5% return with a 2.5% inflation rate and apply the required minimum distribution schedule for a uniform lifetime as described in the text.

consumption profile, and potentially the rate at which she will draw down a DC plan. An individual who believed that she faced a significantly lower mortality risk than that embodied in the IRS life table would choose to consume less each year than an otherwise identical individual who believed that that life table accurately described her mortality risk. The low-mortality individual would be more likely than the high-mortality individual to regard the RMD rules as constraining the amount that could be held in a qualified plan account, and to take advantage of the opportunity to suspend such distributions if it was offered. Differences in discount rates would have the same effect, with a low discount rate leading an individual to prefer deferred consumption and to regard the RMD rules as constraining the size of the account balance that could be carried forward.

While we do not have any measures of a participant’s discount rate, we do have data on longevity after the RMD suspension year. If individuals have some information on their mortality prospects, those who die sooner are more likely to have high higher subjective mortality rates, and to view RMD rules as less binding constraints than those who live longer ex post and who may have lower subjective mortality rates. Women also have longer life expectancies than men, and since the RMD rules are based on unisex mortality tables, the incentive for women to suspend should be greater than the incentive for men. There are also wealth-related differences in mortality, described for example by Smith (1999) and many other studies. If wealthier individuals expect to live longer than their less-wealthy contemporaries, this could generate a relationship between participant wealth and suspension decisions.

Second, bequest motives may influence whether an individual regards the RMD rules as binding. If a participant plans to leave an estate, his optimal consumption path, all else equal, will be lower than that of someone with no estate plans. An individual’s financial holdings

at TIAA are likely to be positively correlated with potential bequest motives. If, on average, those with small account balances are less likely to plan to leave bequests, then the RMD rules are less likely to be binding constraints on the small account holders relative to those with large balances. We study the relationship between account balance and suspension probability.³

Third, the difference between the after-tax and the pre-tax rate of return should influence the optimal level of withdrawals from a qualified plan. A large difference between the pre-tax return while assets are invested in the qualified account and the after-tax return outside the account provides a larger incentive to preserve the qualified plan assets, and hence to take advantage of the opportunity to suspend distributions. Although we do not have any information on a participant’s marginal tax rate, it is also likely to be correlated with total plan assets. Those with higher account balances would be expected to face higher tax rates, lower after-tax returns outside their DC plan, and hence to be more likely to suspend distributions in 2009.

Fourth, the time path of marginal tax rates on plan distributions should affect the attractiveness of suspension. If a participant believes that his tax rate is likely to decline over time, then there is an incentive to delay distributions. Younger participants, especially those who may still be working or who may have a spouse who is still working, are more likely to expect falling marginal tax rates; this predicts a higher rate of suspensions among younger relative to older qualified plan participants. While in principle deferring one year’s distribution could lead a plan participant to face higher

³ Variation in risk aversion should also affect the likelihood of suspension in a way similar to the presence of a bequest motive. A more risk averse individual will be more likely to desire a stock of assets to support late-life consumption, and will therefore be more likely to be constrained by RMD rules.

marginal tax rates in subsequent years because all future distributions would be larger, illustrative calculations suggest that in practice this is an unlikely scenario.

1.2. Previous Research on Distribution Patterns and RMDs

A number of previous studies have explored distributions from qualified accounts using a variety of data sources. [Sabelhaus \(2000\)](#); [Bershadker and Smith \(2006\)](#); [Bryant \(2008\)](#), and [Mortenson et al. \(2016\)](#) examine tax return data, which offer precise information on distributions but limited information on participant characteristics. [Holden and Bass \(2012\)](#) use administrative records from mutual funds that administer IRAs, Keogh plans, and corporate defined contribution plans to track distribution patterns. [Poterba et al. \(2013\)](#) use household survey data from the SIPP and HRS. Collectively, these studies suggest that distributions from qualified plans rise sharply when participants reach age 70½. They also suggest that substantial numbers of qualified plan participants do not take any distributions prior to this age, so that RMD rules presumptively affect the distribution pattern that they would otherwise choose.

The study that most closely relates to the current analysis is [Mortenson et al. \(2016\)](#), which analyzes a sample of federal tax return filings from individuals over the age of 60 in the years 1999–2014. This study estimates a counterfactual distribution of IRA distributions in 2009, assuming that the distribution holiday was never enacted. It concludes that 41% of those who were subject to the RMD rules would have taken smaller distributions in the absence of these rules. This is a larger decline than the aggregate data on the number of IRA distributions in 2009 suggest, in part because this study focuses on the subset of taxpayers who were subject to RMD rules.

Past studies using household survey data reveal a surprisingly high fraction of households with members over the age of 70½ and assets in qualified accounts that do not report any distributions. A number of explanations have been advanced for this finding: the accounts could be Roth IRAs that are not subject to RMDs; the accounts could be employer-sponsored and the account holders may still be employed; the accounts, when reported on household surveys, may be held by other members of the households who are not yet subject to RMD rules; or households may not be compliant with RMD regulations. All of these factors may contribute to some degree, but they cannot be distinguished in most survey-based studies. Even in tax return data, and especially at older ages, [Mortenson et al. \(2016\)](#) find a significant number of IRA holders who are subject to the RMD rules but do not report distributions.

Studies that use tax returns have limited information on participant attributes, and many lack data on the age of the tax filer. Our data set includes some information on account holder attributes, including age, which can prove valuable in studying distribution behavior.

2. Background and Summary Statistics: Distributions from TIAA

TIAA is a diversified financial services company that provides investment and retirement income services for workers in the not-for-profit sector, primarily in the higher education industry. It served over three million participants in 2010. Participants include faculty and staff at universities, medical institutions, public and private K-12 schools, and a number of other not-for-profit entities. TIAA participants may be covered by a number of employer sponsored qualified plans, including 401(a), 403(b) and 457 plans.

In 2008, 327,286 TIAA participants above age 65 received a retirement income distribution. These distributions include any type of cash payment that needed to be reported to the IRS. Individuals who accumulated assets in TIAA but moved them to another financial services firm before reaching distribution age are not included. The majority of the participants were in employer-sponsored 403(b) plans. The most common distribution type, associated with

215,321 participants, was a payout from an annuity contract. The next most common, with 81,826 participants, was a payment from a contract labeled the “Minimum Distribution Option” (MDO). Under this contract, TIAA provides the participant with an annual payment equal to his or her RMD. In addition, there were 27,796 participants who took a lump-sum distribution, 26,719 who received payments from recurring or systematic withdrawals, and 14,834 who received only the interest generated by the assets in an annuity contract. Another 10,216 received non-annuitized installment payments from guaranteed accounts. Participants who had not annuitized their assets were not restricted to a single type of distribution, although most had only one type.

Our analysis focuses on the 81,826 participants covered by MDO contracts for 2008. For each of them, TIAA automatically calculates and distributes an amount equal to their RMD. Participants using the MDO service may take additional distributions if they wish. If an individual annuitizes part of her account during a year, the purchase price of the annuity is included in the account balance for the previous year-end and the first year annuity payment is counted toward meeting the RMD. In subsequent years, however, the annuity contract value and annual income from it are both excluded from the RMD calculation. Someone who partially annuitizes their account must therefore still take RMDs on their non-annuitized plan assets.

For participants with multiple accounts subject to RMDs, the RMD must be calculated for each account separately. However, individuals may aggregate the RMD amount for all IRAs and take a distribution from any one (or more) account if they wish, even if these accounts are held at separate financial institutions. Aggregation is also permitted for participants with multiple 403(b) plans, although one cannot aggregate an IRA with a 403(b). For other defined contribution plans, individuals must calculate RMDs separately for each plan and withdraw the RMD amount from each. Because our data are restricted to a single provider, we are unable to determine if 403(b) participants are aggregating distributions with accounts at other providers.

Participants who select the MDO contract can choose to receive payments on a monthly, quarterly, semi-annual or annual schedule. They may also request distributions that are larger than the RMD amount, and they may change their distribution choices at any time during the year. Because we require information on distributions in 2008 (before the RMD holiday) as well as 2009 and 2010, and because we require a number of other participant attributes for our analysis, we ultimately analyze only a subset of the participants with MDO contracts in 2008. After we exclude the participants without information for all of 2008, 2009, and 2010, as well as those whose records are missing other data, we have a three-year balanced panel with 63,859 participants. None of the participants in our sample had Roth accounts at TIAA. TIAA began to offer Roth accounts during our sample period, and no such accounts were in distribution.

[Table 2](#) provides descriptive statistics on our sample population. The average age in 2009 is 76.7 years. Primary beneficiaries, those who contributed to and accumulated the account balance, are older (77.4) on average than secondary beneficiaries, those who have acquired their accounts as bequests from someone else (61.6 years old). Men comprise about 56.8% and married persons about 67.4% of the sample. The table shows substantial heterogeneity in account balances: the mean balance for primary beneficiaries in 2007 was \$494,591, but the median was less than half this value, \$240,854.

In 2008, the mean RMD was \$19,573 and the median was \$6,765. For 2009, the mean RMD fell by \$8,433 (43.1%) to \$11,140, and the median RMD declined \$5,102 (75.4%) to \$1,663. For primary beneficiaries, those who accumulated the qualified plan balance, the mean RMD fell from \$20,073 to \$11,500, or by 42.7%. Although the absolute decline was smaller for beneficiaries, including surviving spouses, who inherited their accounts, the percentage decline was slightly larger. In 2010,

Table 2
Descriptive Statistics: Suspension-Eligible TIAA Participants, 2009.

| | Mean | Median | Standard Deviation |
|---------------------------------------|---------|---------|--------------------|
| Age (years) in 2009 (N = 66,849) | 76.7 | 76.7 | 6.4 |
| - Primary Beneficiaries (N = 63,859) | 77.4 | 76.8 | 4.5 |
| - Secondary Beneficiaries (N = 2,990) | 61.6 | 59.2 | 15.3 |
| Male | 0.568 | 1.0 | |
| Married | 0.674 | 1.0 | |
| 2007 Assets | 485,313 | 233,302 | 644,537 |
| - Primary | 494,591 | 240,854 | 651,277 |
| - Secondary | 287,176 | 134,006 | 433,448 |
| 2008 RMD | 19,573 | 6,765 | 52,350 |
| - Primary | 20,073 | 7,045 | 53,354 |
| - Secondary | 8,891 | 3,025 | 18,831 |
| 2009 RMD | 11,140 | 1,663 | 42,581 |
| - Primary | 11,500 | 1,801 | 43,446 |
| - Secondary | 3,453 | 0 | 12,668 |
| 2010 RMD | 20,091 | 6,163 | 66,385 |
| - Primary | 20,771 | 6,549 | 67,668 |
| - Secondary | 5,576 | 507 | 22,623 |

Source: Authors' tabulations using TIAA Participant Database. Primary beneficiaries are those who accumulated the account balance; secondary beneficiaries received the account as a bequest. Dollar amounts are in current dollars. See text for further sample description.

when RMD rules were reinstated, the mean RMD was 102.6% of the mean 2008 level, although the median RMD was only about 91% of the 2008 median level.

To explore whether our sample is representative of the U.S. population with qualified accounts subject to RMDs, we examined data from the 2010 Survey of Consumer Finances. Among SCF respondents who were at least 71 years old, 4.8% reported some assets in an employer-sponsored defined contribution account, such as a 401(k) or a 403(b) plan, and 30.6% reported some assets in an IRA. Among those with employer-sponsored qualified plans, the mean value of the assets in these accounts was \$255,488. This refers to the total value of accounts, potentially from multiple employers. The median qualified plan balance was much lower: \$36,000. Both the mean and median for men in the 71+ age group was significantly higher than that for women. These statistics suggest that TIAA participants have larger account balances than typical DC plan participants. This could arise from their having higher lifetime incomes, higher savings rates, being more likely to contribute to a single retirement plan for their whole career, being less likely to roll some or all of their accumulated assets into an IRA, or from a combination of these factors. The median account balance in the TIAA sample, \$240,854, falls between the 80th and the 85th percentile of the qualified plan balances in the SCF. These comparison statistics suggest that caution is appropriate before generalizing our findings to the U.S. population.

The TIAA participant population may however be more representative of the future U.S. qualified plan participant population than of the current one, because many TIAA participants probably worked for employers who offered a qualified retirement savings plan for most of their careers. In contrast, most current U.S. retirees who have accumulated 401(k) or IRA balances, excluding those who worked in the academic sector and had life-long 403(b) coverage, were covered by their plan for only part of their working careers. Both IRAs and 401(k) plans were established by laws passed in the 1970s, but did not experience sharp growth until the 1980s.

3. TIAA Participant Response to the 2009 RMD Holiday

TIAA sent multiple mailings and other communications to MDO contract holders after the RMD holiday was enacted in 2009. These communications explained the rules of the RMD holiday and provided instructions for what participants needed to do in order to suspend their RMD. TIAA sent another round of communications when the U.S. Treasury Department issued rules that allowed participants to return RMD amounts that had been distributed early in the year. The actual letters

Table 3
Probability of Suspending 2009 RMD Distribution among 2008 RMD Distributors.

| Beneficiary Type | Distribution Type | | | |
|------------------|-------------------|---------------|-------------|-------|
| | RMD Only | RMD + Annuity | RMD + Other | Total |
| Primary | 37.2% | 32.1% | 36.4% | 36.1% |
| Secondary | 19.5 | 25.4 | 28.5 | 22.7 |
| Total | 36.5 | 32.0 | 35.1 | 35.5 |

Source: Authors' tabulations using TIAA Participant Database. See text for further details. Primary beneficiaries are those who accumulated the account balance; secondary beneficiaries are those who received the account as a bequest.

are available as an online appendix.⁴ Very few participants in our survey who had already taken a distribution chose to return their RMD after receiving this notification.

3.1. Suspension decisions

Table 3 shows the percentage of those who received their RMD through a Minimum Distribution Option payout in 2008 who suspended distributions in 2009. We divide the sample between primary and secondary beneficiaries, and between those who took only minimum distributions in 2008 and those who received both the RMD and some other annuity or non-annuitized payout from TIAA. The table shows that just over one third – 35.5% – of the participants who received a minimum distribution in 2008 suspended their distribution in 2009. The small differences between those taking only the RMD (36.5%) and those taking the RMD and another non-annuity distribution (35.1%) may seem surprising, since one might argue that those taking only the RMD were the most constrained by the RMD rules. Interestingly, those receiving an RMD and annuity payment were least likely to suspend and secondary beneficiaries were significantly less likely to suspend their RMD than primary beneficiaries.

To place the suspension rate in context, we calculated the next-year suspension rates for TIAA participants who were receiving their RMD through a MDO arrangement in 2005 (2.2%), 2006 (1.9%), and 2007 (4.2%). These groups are likely to be comparable to, and overlap substantially with, the set of RMD recipients for 2008. These rates are all substantially lower than the 35.5% of 2008 recipients who suspended in 2009. Moreover, 98.9% of the 2008 RMD recipients who suspended their 2009 distributions returned to receiving distributions in 2010.

Fig. 2 presents suspension rates of primary beneficiaries by deciles of the dollar amount of their 2008 RMD. The data show the likelihood of suspending increased smoothly with the size of the RMD over the first six deciles of the RMD distribution, and that it was roughly constant for the four highest deciles. Participants in the top four deciles were about twice as likely to suspend their distribution as participants in the bottom two deciles.⁵ A participant could have a large RMD because his account balance was large or because he was advanced in age and was applying a high RMD fraction to a more modest account balance.

Fig. 3 disaggregates primary beneficiaries by the amount of their account balances at year-end 2007, thereby providing cleaner information on the differences in suspension probabilities by account balances. The figure shows a smoothly increasing pattern of suspension rates by account size, with more than a doubling of these rates between the lowest decile and the top four deciles. Participants in the highest account balance decile are somewhat more likely to suspend distributions – 47.9% – than participants in the second highest (44%) or third highest (41.9%) deciles. Even for the highest decile, however, the probability of suspending distributions is less than 50%. The broadly positive relationship between account balance and suspension probability is consistent with a number of the considerations discussed above, including

⁴ <http://dx.doi.org/10.1016/j.jpubeco.2016.08.010>.

⁵ For participants in the lowest deciles, ranked by the amount of the RMD, distributions are modest, averaging less than \$5,000 in the four lowest deciles together.

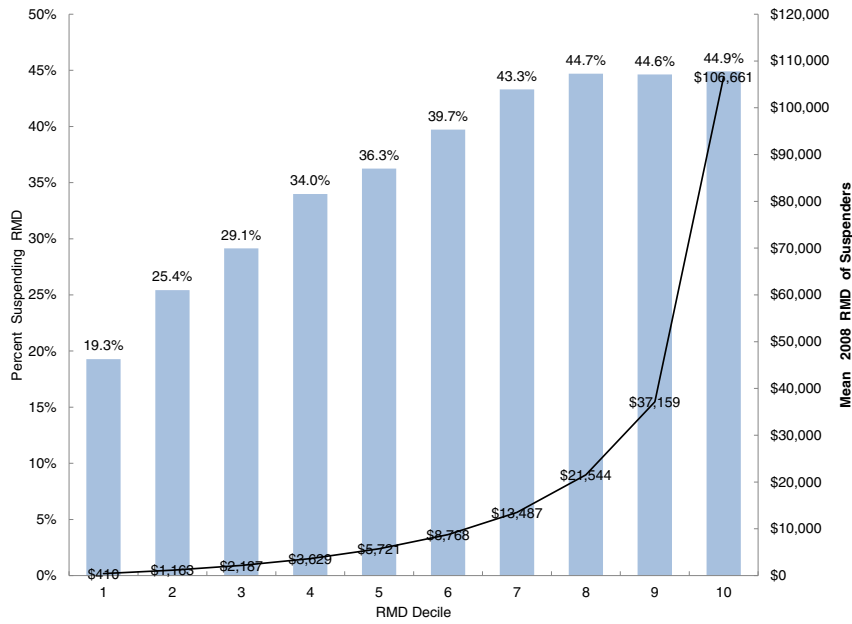


Fig. 2. Probability of Suspending Distribution in 2009 by Decile of 2008 Distribution. Source: Authors' tabulations of TIAA data as described in the text.

lower mortality rates for those in higher wealth categories, higher marginal tax rates on investment income and a greater likelihood of exhibiting a bequest motive.

Fig. 4 presents additional detail on the link between total account balance and suspension probability, dividing primary beneficiaries into categories based on the value of their holdings. The marginal relationship between wealth and suspension rates is strongest at lower account balances. Above the median balance – about \$250,000 – there is relatively little effect of a larger balance on the suspension rate.

Participant age is the other factor that determines the size of a participant's RMD. Fig. 5 examines the likelihood of a primary beneficiary suspending by five-year age categories. The probability of suspending distributions declines with age. Over 40% of participants between the

ages of 70 and 75 suspended, but only 23% of those over the age of 90 did so. This pattern is consistent with distributions from retirement accounts representing a more important source of income for older individuals. It is also consistent with the value of continued tax deferral being greater for those who have a longer remaining life expectancy.

3.2. Survey evidence on motives for suspending distributions

The description of participant behavior offers insight on the fraction of those taking distributions from qualified plans who may be constrained by RMDs, but it does not provide much insight on the motives underlying the choices that they make. To explore this issue, in March and May 2014 we carried out a survey of participants who were affected by RMD rules in 2009. The survey population began

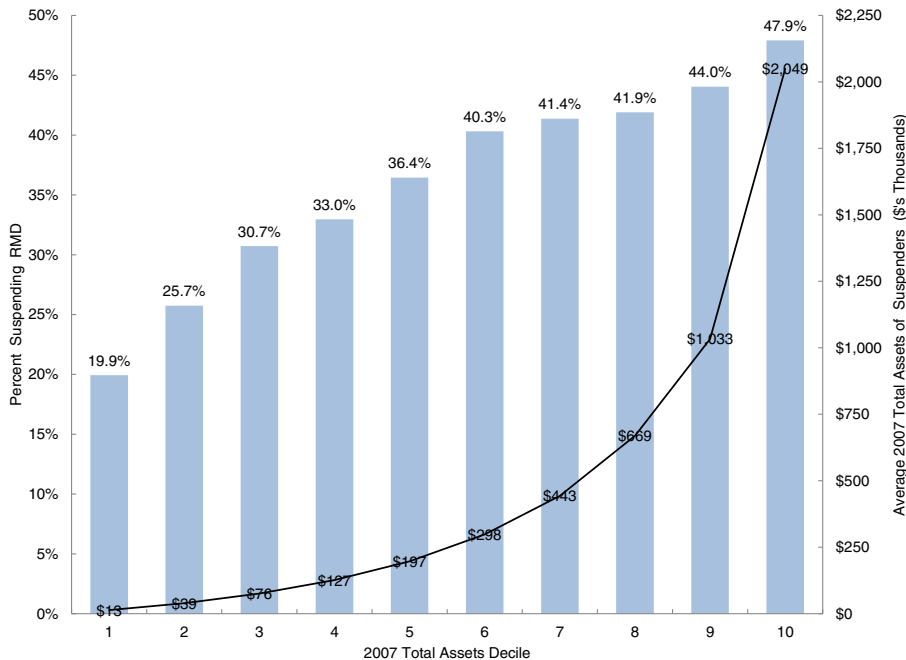


Fig. 3. Probability of Suspending Distribution in 2009 by Decile of Total TIAA Assets. Source: Author tabulations of TIAA as described in the text.

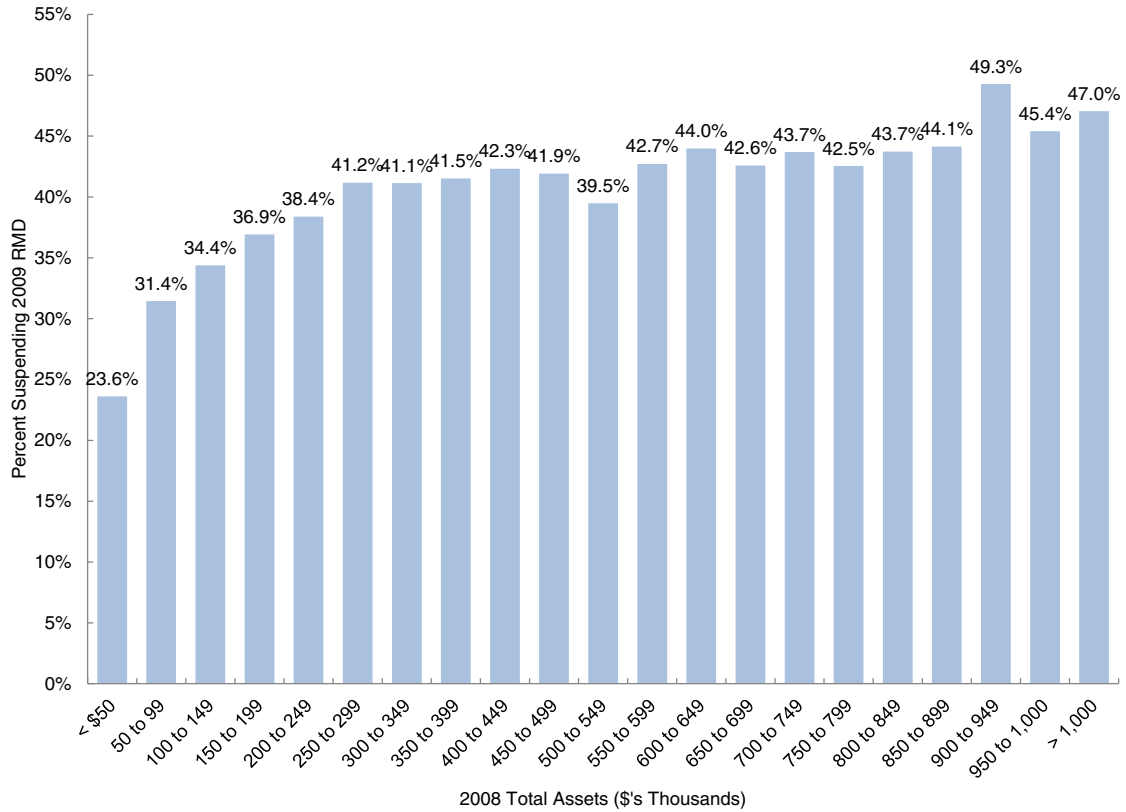


Fig. 4. Probability of Suspending 2009 Distribution by Amount of 2008 TIAA Assets. Source: Authors' tabulations of TIAA data as described in the text.

with our panel of 63,859 participants who received distributions in 2008. We excluded those who were on the company's "do not contact" list or who fell under other contact restriction protocols, and randomly selected 29,960 (46.9%) of the remaining individuals and sent them an email survey.

Twenty-three percent of those contacted responded with complete surveys, yielding a sample of 6,956 survey respondents. There are several sources of non-random selection in our sample, however. First, our sample is limited to those who were still alive in 2014. Second, although we found very little variation in response rates from ages 70 – 84, the

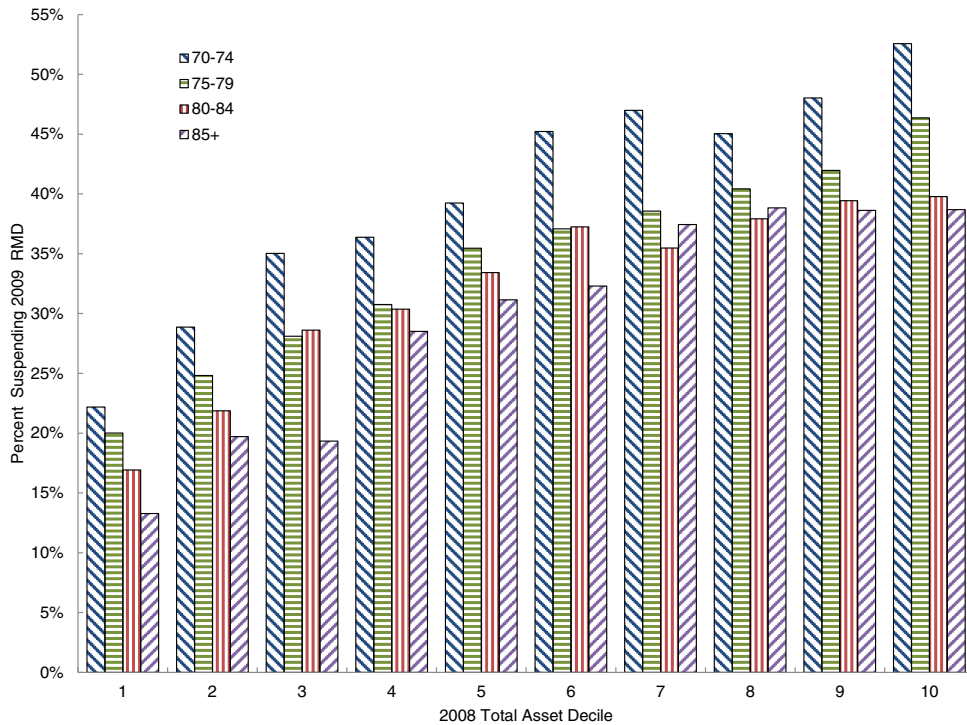


Fig. 5. Probability of Suspending Distribution in 2009, by 2007 TIAA Assets and Age. Source: Authors' tabulations of TIAA data as described in the text.

response rate to our survey dropped steeply at older ages. For example, the response rate of 80–84 years olds was 23.5%, but it was only 17.2% for those in the 85–89 age group. Those at very advanced ages were also less likely to complete the survey once started. Our survey sample over-represents men, both because men were more likely to be in our initial sample and because the survey response rate was higher for men (27.2%) than for women (21.6%). This reflects, in part, the fact that women make up a larger fraction of those ages 85 and older. We also find that the probability of completing the survey rises with the size of one's TIAA account balance, from a low of 16.7% in the bottom quintile to a high of 30.7% in the highest quintile. Overall, in comparison to the TIAA participant population subject to RMD rules, survey respondents are younger, more likely to be male, and have higher average account balances.

The survey consisted of sixteen questions designed to explore the key drivers of RMD suspension behavior. The questions focused on three issues: (1) awareness of the one year RMD suspension, (2) reasons for suspending (or not), and (3) the importance of RMDs and other sources of income for retirement well-being.

To investigate awareness of the RMD holiday, we asked whether participants were aware at the time (in 2009) that Congress had temporarily changed the tax law so that they were allowed to skip taking that year's distribution. Fifty-five percent of the respondents indicated that they were; the remaining 45% were in a combined "no, don't know, don't remember" category. This may understate knowledge of the provision at the time if some portion of the 45% were aware but have since forgotten. Nonetheless, it does indicate that a substantial fraction of the population may not have responded simply due to lack of knowledge that this option was available. We asked those who said they were aware of the distribution holiday how they learned about it. The news media was the most common response, accounting for 63% of those who remembered knowing about the holiday. This was followed by professional financial advisers (22%), a family member (3%), and "another source" (12%). After conducting the survey, we realized that we should have included a category for "communication from TIAA-CREF." Since the company wrote to participants about the distribution holiday, it seems likely that some participants learned about the legislative change from these mailings. It is not clear how respondents for whom this is the case would have answered the survey question.

We asked all respondents to gauge the importance of various factors when determining how much money to withdraw from their retirement accounts each year. Fig. 6 shows more than 90% considered complying with the RMD rules as either very or somewhat important, compared with around 65% for other factors, which include maintaining their standard of living, minimizing the amount of taxes paid, and covering unusual or unexpected expenses.

To explore the reasons for suspending or maintaining distributions in 2009, we asked survey respondents who had suspended their distributions to rate the importance of four factors that might have influenced their decision. Table 4 reports the findings. The reason for suspending that attracted the largest share of "very important" responses – more than 80% – was "allowing money to continue growing tax free/save on taxes." Only 2% ranked this as unimportant. "Preserving money for older ages" and "don't need the money to support current spending" were ranked "very important" by 50 and 45% of the respondents respectively. Roughly 15% of the respondents reported that each of these factors was not important. Only 3% of the respondents indicated that they suspended distributions because they thought that the law prevented them from taking a 2009 distribution. This response pattern suggests that long-term wealth building goals, and the value of accumulating at the pre-tax rate of return, were key considerations for those who chose to suspend.

Table 5 reports analogous information for the respondents who did not suspend distributions. In contrast to the responses about factors that were important in the decision to suspend, no single factor was identified as "very important" by a majority of the respondents who did not suspend. Roughly one third indicated that they "depend on distributions for daily spending needs," and another 27% listed this as a somewhat important factor in their decision. Thirty-nine percent of those who did not suspend, however, indicated that this factor was not important. More than half of the respondents rated as very or somewhat important their interpretation of "the RMD as a good guide to appropriate speed of draw-down." Twenty-four percent of respondents listed this as very important, and 38% as somewhat important.

Two factors that did not appear to be important considerations in suspension decisions were procrastination and a need for immediate access to assets. Eighty-three percent of the respondents who did not

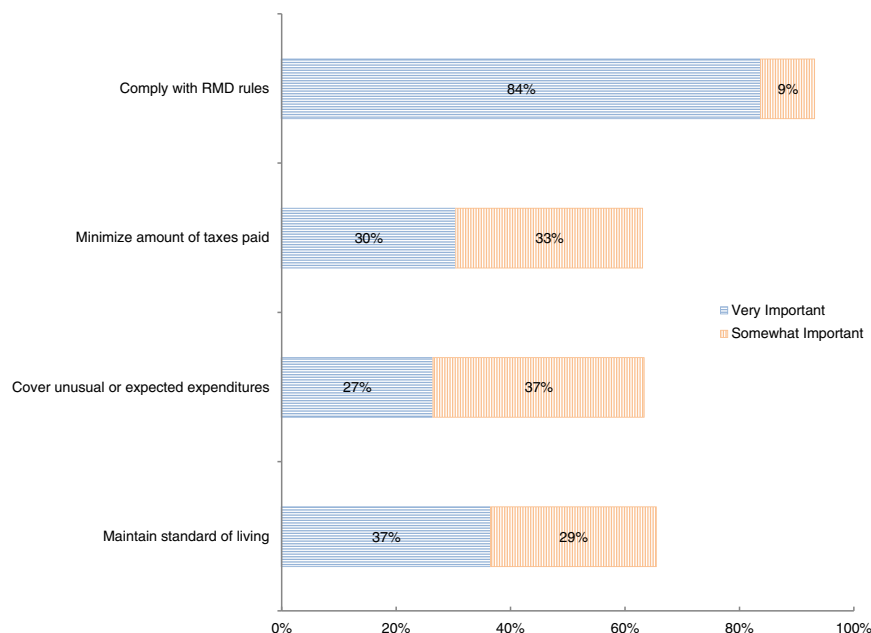


Fig. 6. Importance of Various Factors in Determining Retirement Distribution. Source: Authors' tabulations of survey data from TIAA as described in the text.

Table 4
Rationale for Suspending Distributions (Among Suspenders).

| Motive | Very Important | Somewhat Important | Not Important |
|----------------------------------------------------------------|----------------|--------------------|---------------|
| Allow Money to Continue to Grow Tax Free/Postpone Paying Taxes | 81.7% | 16.2% | 2.1% |
| Preserve More Money for Older Ages | 49.7 | 34.9 | 15.4 |
| Don't Need the Money to Support Current Spending | 44.7 | 41.7 | 13.6 |
| Thought I was not Allowed to Take a Distribution in 2009 | 3.4 | 4.6 | 91.9 |

Source: Authors' tabulations using from survey responses from TIAA distribution recipient survey described in text.

suspend rated "never got around to it" as not important in their decision, and 75% ranked "want easy access to funds in case of emergency" as not important. The latter response suggests either that participants view their assets held within qualified plans as accessible, or that participants have access to other financial assets and do not need to rely on their TIAA assets in the case of an emergency.

To further explore the responses about needing RMD funds to cover spending needs, and about the value of RMDs as a guide to appropriate draw-down, we assigned our survey respondents to the quintile of 2007 assets under management into which our earlier participant data suggested they would fall. We then tabulated the suspension rate, and the responses to the questions "Do you view the RMD as providing some guidance on how much you can spend each year for the rest of your life without running out of money?" and to "If you were not required to receive the RMD from your account for one year, would you have other resources that you could draw upon to pay for your current spending needs?" for the respondents in each quintile.

Table 6 presents the findings, which again suggest that the suspension rate rises with the respondents' total assets under management at TIAA. Those in the lowest quintile have a 37% suspension rate, compared with 48% for those in the highest quintile. Surprisingly, the percentage of respondents who say they could cover their spending needs without taking a distribution declines with the amount at TIAA, from 88% (lowest quintile) to 79% (highest quintile). This suggests that some of those who are in the lowest quintile may have assets at other financial services firms that they use to support consumption.

The survey responses also suggest that those with larger asset holdings at TIAA are more likely to assign some guidance role to the RMD amounts. The difference of more than twenty percentage points in the response to this question between the participants in the lowest (36%) and highest (58%) quintiles may indicate that those with larger asset holdings rely more on income from assets as a source of household income, and that for them the RMD is more salient as a consumption guide. This evidence is potentially important, because as we noted earlier the RMD rules can lead to very low distributions at older ages.

Among the survey respondents who had selected TIAA's minimum distribution option, 54.1% indicated that they would choose a smaller distribution if they could do so, 40.4% indicated that they would not change from current practice, and 5.5% indicated that they would take

Table 5
Rationale for Not Suspending Distributions (Among Non-Suspenders).

| Motive | Very Important | Somewhat Important | Not Important |
|---------------------------------------------------------|----------------|--------------------|---------------|
| Depend on Distributions for Daily Spending Needs | 33.8% | 27.0% | 39.2% |
| View RMD as Good Guide to Appropriate Speed of Drawdown | 24.0 | 37.5 | 38.5 |
| Want Easy Access to Funds in Case of Emergency | 6.1 | 18.8 | 75.1 |
| Uncertain About What to do | 20.2 | 36.8 | 42.9 |
| Never Got Around to it | 7.7 | 9.5 | 82.8 |

Source: Authors' tabulations using from survey responses from TIAA distribution recipient survey described in text.

Table 6
Suspension Rate by Asset Quintile (Survey Participants).

| Asset Quintile, 2007 | Suspension Rate | Able to Cover Spending Needs? | Are RMDs a Good Guide to Spendable Amount? |
|----------------------|-----------------|-------------------------------|--------------------------------------------|
| Lowest (N = 620) | 37.3% | 88.0% | 36.0% |
| Second (N = 1083) | 42.7 | 85.1 | 43.4 |
| Third (N = 1474) | 46.5 | 84.4 | 47.3 |
| Fourth (N = 2014) | 47.4 | 82.0 | 53.6 |
| Highest (N = 2581) | 48.4 | 78.8 | 57.5 |

Source: Authors' tabulations using from survey responses from TIAA distribution recipient survey described in text.

a larger distribution if they could. It is difficult to understand the response of the last group, since they could increase their distribution at any time.

The survey responses suggest substantial heterogeneity in the factors that participants consider when they choose distributions from their qualified plans. Taking advantage of the opportunity for accumulation of assets at the pre-tax rate of return is clearly an important factor for many participants who chose to suspend their distributions in 2009. For those who chose not to suspend, a range of factors appears to have influenced their decision. The relationship between distributions from retirement accounts and consumption planning warrants further exploration. Even participants with large qualified plan balances reported that they viewed RMD amounts as a useful guide to feasible consumption spending.

4. Multivariate Analysis of Suspension Decisions

To further explore the relationships between participant account balances, participant age, other participant attributes, and suspension decisions, we estimate multivariate probit models. Table 7 considers suspension distributions for primary beneficiaries. The table shows the estimated marginal effects of each variable on the probability of suspension, along with standard errors for these marginal effects. We include controls for five-year age groups, age 75–79, 80–84, 85–89, and 90+. The youngest group, aged less than 75 years, is the excluded category. We also construct an indicator variable for whether the participant was still alive in November 2015, which we interpret as a noisy indicator of the participant's expected longevity in 2009. The specification also includes indicator variables for whether the participant is male, for whether he or she is married, for the frequency with which the participant currently receives distribution payments, and the natural log of the participant's total assets at TIAA. This is an imperfect measure of participant wealth because it depends both on the participant's total wealth and on the distribution of that wealth across various financial services firms. We regard the variables describing the frequency of withdrawals – an indicator for one annual payment and an indicator for monthly payments – as a source of information on whether the individual is relying on RMD amounts to finance retirement consumption. We believe that those who have chosen monthly payouts are more likely to be using their payouts to support their consumption stream.

The estimates from the multivariate models confirm the age gradient that we found earlier, even after the addition of other control variables. Across all specifications, the likelihood of suspending an RMD is monotonically decreasing with age. Relative to the omitted category of individuals between the ages of 70½ and 74, when the specification includes only demographic information on the participant's age, marital status, and gender, the probability of suspending drops by approximately 5, 8, 10 and 18 percentage points as we move up each 5-year age range. When we include additional covariates that measure asset allocation, the differential between the oldest age group and the rest declines to about 10 percentage points. These results, presented in the fifth and sixth columns of the table, highlight the correlation between age and asset allocation. The findings still display a relationship

Table 7
Determinants of RMD Suspension Probability: Marginal Effects from Probit Models.

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 |
|---------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Age 75–79 | -0.055 (0.003) | -0.052 (0.005) | -0.043 (0.005) | -0.040 (0.006) | -0.038 (0.005) | -0.037 (0.005) | -0.034 (0.005) |
| Age 80–84 | -0.084 (0.004) | -0.078 (0.008) | -0.071 (0.009) | -0.067 (0.009) | -0.059 (0.008) | -0.056 (0.008) | -0.048 (0.007) |
| Age 85–89 | -0.105 (0.005) | -0.086 (0.009) | -0.099 (0.013) | -0.093 (0.013) | -0.077 (0.011) | -0.074 (0.010) | -0.059 (0.008) |
| Age 90 + | -0.182 (0.008) | -0.154 (0.016) | -0.161 (0.021) | -0.150 (0.020) | -0.107 (0.015) | -0.105 (0.015) | -0.078 (0.011) |
| Male | 0.044 (0.002) | -0.012 (0.001) | -0.009 (0.001) | -0.009 (0.002) | -0.014 (0.002) | -0.013 (0.002) | -0.010 (0.002) |
| Married | 0.028 (0.001) | 0.034 (0.003) | 0.033 (0.004) | 0.031 (0.004) | 0.028 (0.004) | 0.027 (0.004) | 0.025 (0.004) |
| Log TIAA Assets 2008 | | 0.055 (0.006) | 0.069 (0.009) | 0.071 (0.010) | 0.077 (0.011) | 0.074 (0.010) | 0.074 (0.011) |
| Monthly Payment Indicator | | | -0.102 (0.013) | -0.098 (0.013) | -0.101 (0.014) | -0.100 (0.014) | -0.100 (0.014) |
| Annual Payment Indicator | | | 0.067 (0.009) | 0.073 (0.010) | 0.073 (0.010) | 0.076 (0.011) | 0.076 (0.011) |
| % Assets in Guaranteed Products | | | | -0.129 (0.018) | -0.123 (0.017) | -0.120 (0.017) | -0.119 (0.017) |
| % Assets in Fixed Income Products | | | | -0.094 (0.013) | -0.099 (0.014) | -0.102 (0.014) | -0.102 (0.015) |
| Total Withdrawals = MDO Amount | | | | | 0.078 (0.011) | 0.079 (0.011) | 0.079 (0.013) |
| Total Withdrawals = MDO + Annuity | | | | | -0.009 (0.001) | -0.005 (0.001) | -0.005 (0.001) |
| Use Financial Adviser? | | | | | | 0.065 (0.009) | 0.064 (0.009) |
| Participant Deceased By November 2015 | | | | | | | -0.066 (0.009) |
| AIC | 82,997 | 81,274 | 80,015 | 79,573 | 79,215 | 79,130 | 79,011 |

Notes: Sample size = 63,859. See text for variable descriptions. Data from TIAA Participant Database. Probit results are the marginal effects evaluated at the mean. Standard errors are shown in parentheses.

between age and suspension probability, consistent with our discussion of age-related differences in the level and potential slope of marginal tax rates, but the magnitude of the age effect is sensitive to the specification chosen.

The estimates in Table 7 suggest that men are less likely to suspend distributions than women, once we control for the total value of assets held at TIAA. The specification in the first column includes only age controls, an indicator for being married, and an indicator variable for a male beneficiary. In this specification, men appear more likely than women to suspend payouts. When the specification is expanded to include total TIAA assets, as in all of the subsequent columns, the suspension rate for men is more than one percent lower than that for women. Because men have shorter life expectancies than women at each age, this finding is consistent with our discussion of how those with higher subjective mortality rates would be less likely to suspend.

Differences in effective planning horizons may also explain the higher suspension rate for married participants. They are between 2.6 and 3.4 percentage points more likely to suspend than singles; this is consistent with married individuals of a given age and gender having a longer household life expectancy than comparable, but single, individuals. The difference between the suspension probabilities for married and single participants does not change when we control for total assets at TIAA. Those receiving monthly payments in 2008 were about 10 percentage points less likely to suspend than those taking quarterly withdrawals, the omitted category in the regression, and about 17 percentage points more likely to suspend than those taking annual withdrawals.

The value of assets held at TIAA has an economically and statistically significant effect on the suspension probability. A 10 percent increase in total assets raises the likelihood of suspension by between 0.5 and 0.7 percentage points. To the extent that the value of assets held at TIAA is a proxy for total household resources, this may indicate that wealthier households are less reliant on RMDs to finance consumption and/or

that these households are more interested in, or able to pursue, tax-minimization strategies.

Participants who hold a larger share of their assets in either guaranteed investment or fixed income products are less likely to suspend, even when we condition on the total value of their TIAA portfolio. This may reflect the net effect of several factors. On the one hand, the value of the tax deferral associated with a qualified account is greater for an asset that generates interest income or other returns taxed as ordinary income than for an equity portfolio that generates dividend and capital gains income that were taxed at preferential rates in 2009. On the other hand, 2008 was a year in which equity markets declined sharply, while corporate and government bond funds experienced large positive returns as interest rates declined. There was much uncertainty in 2009 as to how long the equity bear market would persist, and stock investors may have been reluctant to sell their assets in a “fire sale” during this period. Indeed, part of Congress’ motivation for suspending RMDs in 2009 was a desire to avoid forcing liquidation of stock holdings. Those who did not sell their stocks in 2009 were rewarded with rising equity markets in subsequent years. The finding that participants with higher equity allocations were more likely to suspend is also consistent with a view that investors who are most conservative in their portfolio allocation are interested in stable income flows, and are consequently less likely to alter their distributions.

The models in columns five through seven include an additional indicator variable for whether the participant’s total distributions were exactly equal to the RMD in 2008, a potential flag for those who regarded the distribution rules as a binding constraint. We also add an indicator for whether the participant took only the RMD amount over and above any annuity income they received. The excluded category consists of those who were “unconstrained,” in that they were voluntarily choosing to take distributions in excess of their RMD. Those who only received their RMD amount were 8 percentage points more likely to suspend their distribution than other participants.

The models in the sixth and seventh columns of Table 7 add an indicator for whether a participant uses a TIAA financial adviser. Those who use such advisers are 6.5 percentage points more likely to suspend than those who do not. This may reflect the advisers being more aware than the participants of the changes in RMD rules, and it suggests that the advisers may have encouraged participants to take advantage of the RMD holiday.

Two caveats are in order, however, for interpreting this finding. First, many participants use financial advisers who are not affiliated with TIAA. Our participant survey finds that while only 14% of the respondents are classified as using a TIAA adviser based on administrative records, 48% of survey respondents report using a financial adviser. This suggests that the administrative data understates the frequency of adviser use. Second, use of an adviser is likely to be related to the participant's total wealth. If higher wealth individuals are more likely to suspend regardless of whether they have an adviser or not, and if wealth is correlated with adviser use, our estimates may overstate the effect of an adviser. We continue to find a positive effect of working with an adviser on suspension probability, even after controlling for the participant's total value of TIAA assets. We nevertheless caution against interpreting our adviser coefficient as a causal effect of using a financial adviser.

The last column in Table 7 adds an indicator variable for whether the participant was still alive in November 2015 to the specification. Our earlier discussion highlighted the potential impact of subjective mortality expectations on the attractiveness of suspending distributions. Participants who expected to live longer would place greater value on resources available for future consumption, and would also value additional tax-deferred inside build-up to a greater degree. The empirical findings confirm this prediction: participants who were still alive in late 2015 were 6.6 percentage points more likely to suspend than were those who passed away in the six years after the distribution holiday. Among those who suspended distributions, 90.8 percent survived until November 2015, compared with 86.8 percent of those who did not suspend.

Adding the indicator variable for ex post mortality affects the coefficients on the indicators for age categories in the probit specification. In particular, the absolute value of the coefficients on the 85–89 age group and the 90+ age group fall by about twenty percent when the mortality indicator is included. In the specification in the first column, which does not control for asset holdings or participant longevity, the indicator variable for those over the age of 90 suggests an 18 percentage point drop in suspension rates for this group relative to 70–74 year olds. After including the full set of other characteristics of participant behavior, including asset balance, the coefficient declines to 11 percent in column five. Adding the longevity measure reduces this further, to roughly 8 percentage points. The attenuation of the age-related differences in suspension probabilities when we include a variable that is related to remaining life expectancy supports Fuchs' (1984) hypothesis that proximity to death, rather than years since birth, is an important determinant of various late-life behaviors.

The findings in Table 7 suggest that those with higher asset balances are more likely to suspend. This could be because they have sufficient other income to finance their consumption, which enables them to take advantage of the favorable tax treatment of their qualified account for a longer time, or because they have assets outside their qualified accounts that they can draw down in lieu of qualified plan distributions. Those with higher balances probably face higher marginal tax rates than their lower-wealth counterparts, so the value of tax deferral is also likely to be greater for them.

In addition to examining the direct effect of participant account balance on suspensions, we also explore whether the effect of other variables also varies with account balance. We re-estimated the model shown in the last column of Table 7 separately for five quintiles of the participant wealth distribution, stratifying participants based on the value of their TIAA assets. Table 8 presents the results. The negative age gradient appears to be slightly stronger at higher wealth quintiles, although the pattern of coefficients is not monotonic. Older individuals in all wealth quintiles except the middle one are less likely to suspend than their younger counterparts. Participants

Table 8

Marginal Effects on RMD Suspensions: Estimates from Probit Models Stratified by Total Asset Quintile.

| | Lowest | Second | Third | Fourth | Highest |
|---------------------------------------|--------------------|---------------------|---------------------|-------------------|--------------------|
| Age 75-79 | -0.007 (0.001) | -0.040 (0.006) | -0.034 (0.004) | -0.034 (0.003) | -0.048 (0.003) |
| Age 80-84 | -0.026 (0.005) | -0.031 (0.004) | -0.038 (0.004) | -0.053 (0.005) | -0.082 (0.005) |
| Age 85-89 | -0.048 (0.009) | -0.043 (0.006) | -0.018 (0.002) | -0.053 (0.005) | -0.120 (0.007) |
| Age 90 + | -0.069 (0.013) | -0.105 (0.015) | 0.019 (0.002) | -0.103 (0.009) | -0.145 (0.008) |
| Male | 0.001 (0.00001) | -0.005 (0.00006) | -0.007 (0.00008) | -0.038 (0.003) | 0.000 (0.000) |
| Married | 0.041 (0.008) | 0.017 (0.002) | 0.033 (0.004) | 0.040 (0.004) | -0.008 (0.0005) |
| Monthly Draws | -0.071 (0.013) | -0.061 (0.009) | -0.120 (0.013) | -0.122 (0.011) | -0.089 (0.005) |
| Annual Draws | 0.050 (0.009) | 0.080 (0.011) | 0.058 (0.006) | 0.077 (0.007) | 0.109 (0.006) |
| % Assets in Guaranteed Products | -0.085 (0.016) | -0.152 (0.022) | -0.145 (0.016) | -0.122 (0.011) | -0.097 (0.005) |
| % Assets in Fixed Income Products | -0.080 (0.015) | -0.136 (0.019) | -0.141 (0.016) | -0.076 (0.007) | -0.073 (0.004) |
| Total Withdrawals = MDO Amount | 0.080 (0.015) | 0.103 (0.015) | 0.098 (0.011) | 0.081 (0.007) | 0.055 (0.003) |
| Total Withdrawals = MDO + Annuity | -0.016 (0.003) | -0.018 (0.003) | -0.026 (0.003) | -0.014 (0.001) | 0.024 (0.001) |
| Use Financial Adviser? | 0.070 (0.013) | 0.088 (0.012) | 0.075 (0.008) | 0.075 (0.007) | 0.066 (0.004) |
| Participant Deceased By November 2015 | -0.052 (0.010) | -0.079 (0.011) | -0.046 (0.005) | -0.078 (0.007) | -0.078 (0.004) |
| AIC | 13172 | 15213 | 16272 | 16852 | 17409 |

Notes: Sample size = 63,859. See text for variable descriptions. Data from TIAA Participant Database. Entries are marginal effects evaluated at the mean. Standard errors are shown in parentheses.

who are over ninety, and in the highest wealth quintile, are particularly unlikely to suspend. The general pattern is consistent with older individuals being less likely to suspend, perhaps because they are more likely to rely on distributions to finance consumption.

The difference in suspension probabilities between those taking monthly and annual payouts is increasing in wealth quintile. For example, in the lowest quintile those taking monthly payouts are 12 percentage points less likely to suspend distributions than those taking annual payouts. This differential monotonically increases with wealth quintile to a nearly 20 percentage point differential in the top quintile. One interpretation of this pattern is that participants in the top quintile who are taking annual distributions do not need their distributions to finance consumption, and consequently have greater flexibility to suspend their payouts. The effect of participant longevity, measured by the indicator variable for whether the participant died before November 2015, is relatively stable across asset quintiles.

5. Conclusions and Future Directions

Our results suggest that about one third of qualified retirement plan participants chose to suspend required minimum distributions (RMDs) when this opportunity arose in 2009. Younger and wealthier individuals

were more likely to suspend than their older and poorer colleagues, a finding that is consistent with a number of considerations that bear on the draw-down of qualified plan assets, such as the presence of bequest motives and the level and future trajectory of marginal tax rates. The probability that a participant with a retirement account balance of less than \$50,000 suspended distributions was about 24%, compared with 34% for a participant with a balance between \$100,000 and \$150,000, and just over 40% for those with a balance above \$250,000. We found very little difference in suspension probabilities as a function of account balance for those with balances above \$250,000.

These results inform the trade-offs that exist with regard to regulations governing distributions from qualified plans. On the one hand, we find that a substantial fraction of participants rank tax considerations as important and would prefer to allow their balances to grow at the before-tax rate of return. RMD regulations raise revenue by limiting the ability of this group to hold large balances in qualified accounts until late in their retirement. At the same time, many individuals view the RMD rules as informative with regard to the sustainability of their retirement distributions, despite the fact that strict adherence to RMD rules would lead to very low distributions at advanced ages.

Our findings provide a starting point for analyzing how changes in RMD rules might affect federal revenues. [Warszawsky \(1998\)](#) and the [U.S. Congress Joint Economic Committee \(2002\)](#), among others, have discussed proposals to remove minimum distribution requirements, raise the age at which they take effect, or to reform them to allow substantially greater flexibility for retirees. The revenue consequences of such changes depend on the fraction of distributions that are currently associated with those rules that would be postponed in a less restrictive regime.

In our data sample, the average distribution for primary beneficiaries, those who had contributed to the account, fell from \$20,073 in 2008 to \$11,500 in 2009 – a 43% decline. Because average account balances fell nearly 19% from year-end 2007 (\$494,590) to year-end 2008 (\$401,823), the ratio of distributions to account value for those affected by RMDs in 2008 declined from 4.06% to 2.86%. Distributions other than RMDs, for example annuities and optional distributions, rose modestly as a share of assets between 2008 and 2009, so the total value of distributions from these accounts declined from 5.54% in 2008 to 4.54% in 2009. If our results can be extrapolated to the broader population of qualified plan holders – and the larger average size of the accounts in our sample relative to the population suggests caution in doing this – then the near-term effect of eliminating RMD rules might be a decline of roughly 20% in the taxable distributions that are currently associated with these rules.

We are not aware of any data on the aggregate value of retirement plan assets that are subject to the RMD rules, even though it is a key input for revenue analysis. In 2011, according to the [U.S. Internal Revenue Service \(2013\)](#), 13.0 million tax returns reported \$217.3 billion in taxable IRA distributions. In addition, 26.8 million returns reported \$581.2 billion in pension and annuity income, although much of this income, for example payments from defined benefit plans, is not affected by RMD rules. If all IRA distributions were the result of RMD rules, but none of the pension and annuity income was, then a 20% decline in distributions associated with a relaxation of RMD rules would translate to a \$43.4 billion decline in distributions. At an average tax rate of 20% on the recipients, this would imply a revenue loss of \$8.7 billion. If half of the payouts in the pension and annuity income category were also the result of RMDs, this estimate would more than double. These estimates are both substantially greater than the \$3.8 billion revenue estimate offered by the U.S. Joint Committee on Taxation (2008) when scoring the 2009 distribution holiday.

Although our results provide insight on the factors that affect distribution behavior, they are limited by our data constraints. First, we only observe accounts at one financial institution. Because participants in 403(b) plans may aggregate across multiple plans and take their

distribution from only one, it is possible that some participants who were taking distributions from TIAA 403(b) plans in 2008 changed the financial institution from which they were taking distributions for 2009, while continuing to take such distributions. Participants who did so would show up in our data as suspending distributions, while in fact they would have continued such distributions. The finding that most of those who suspended in 2009 took a distribution in 2010 leads us to discount this possibility. Issues such as this are inherent to the use of participant-based data from a single financial institution. Sample survey data can overcome this limitation, at the cost of typically much less accurate information on participant account balances and decisions and at the risk of reporting error and recall bias. The consistency between our estimates that roughly one third of RMD-affected participants suspended distributions, and [Mortenson, Schramm, and Whitten's \(2016\)](#) estimates that 41% of IRA participants facing RMDs would prefer to take smaller distributions, suggests that the multiple-institution problem may not be too serious.

Second, our data only describes plan distributions, not consumption spending. This is an important limitation. It is possible that participants reinvest their distributions in non-qualified accounts. Whether distributions are spent has only a modest effect on the short-term revenue effects of changes to RMD rules, but it can influence whether changes in RMD rules affect long-term retirement security. Once again, there is a tradeoff between administrative record data and household survey data for answering this question.

Third, our study is based on a one-year suspension of the RMD rules. The steady-state effects of increasing the RMD age might differ from the one-year effect. The fraction of retirees who choose not to take a distribution at age 73, for example, when they have already taken distributions at ages 71 and 72, may differ from the fraction that would choose to forego a distribution if the RMD age is raised to 73½, because in the new policy regime some 73 year-olds might find themselves with a need for distributions to support consumption.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jpubeco.2016.08.010>.

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