WORKING PAPER

Opting out of Retirement Plan Default Settings

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Abstract

The introduction of automatic enrollment (AE) features into employer sponsored defined contribution plans has greatly increased retirement plan participation by automatically enrolling employees into their employers' plans. We analyze administrative data provided by Vanguard on approximately 100,000 newly hired employees who are eligible for 206 unique plans featuring automatic enrollment. We find that most participants will at some point take an "active" stance towards their retirement savings by choosing either a different contribution rate or investment portfolio than that specified by their plan's default settings. Among our sample of over 95,000 newly hired employees participating in their employer's AE plan, we find that 59 percent elect a different contribution rate, investment portfolio, or both within the first few years of participation. Selecting a different contribution rate is considerably more common than selecting different investments: 57 percent of participants choose a contribution rate different than the default, while only 17 percent elect a different investment portfolio. Moreover, among those that select a different contribution rate, roughly two thirds increase their contribution rate above that specified by their plan while another third decreases their contribution rate below the plan default.

When examining what characteristics are predictive of becoming an active participant, we find that women are slightly more likely than men to choose a contribution rate different than the default, and do so by reducing their contribution levels on average. Conversely, participants with higher incomes are more likely to select contribution rates above the default than their lower-income peers. Plan-level characteristics are also important predictors of choosing a contribution rate different than the default. In particular, participants are more likely to actively increase their contribution rates if they are in plans that offer immediate vesting of employer contributions, or if they face a default contribution rate this is too low to receive the maximum possible employer match. Conversely, participants are more likely to reduce their contributions below the default rate if they participate in plans that feature default enrollment in automatic escalation (a plan feature under which a participant's contribution rate automatically increases over time), or plans that initially have a default deferral percentage above 3 percent (the median default contribution rate in our data).

When it comes to choosing a different investment portfolio than the default, we find that men, those with higher incomes, and participants in plans that feature immediate vesting of employer contributions are more likely to choose their own investment portfolio.

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Acknowledgments

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1. Introduction

Following adoption of the Pension Protection Act (PPA) of 2006, increasing numbers of employers have adopted automatic enrollment (AE) features in their employer-sponsored defined contribution (DC) retirement savings plans. Under AE, employees are automatically enrolled into a DC plan unless the employee actively chooses to opt out, which effectively switches the default from non-participation to participation in DC savings plans. A 2010 Hewitt survey found that 59 percent of large U.S. firms that provide a DC plan had AE features for new employees, up from 24 percent in 2006 (Hewitt Associates, 2010). The increased adoption of AE features among employer-sponsored retirement plans has had positive implications for the retirement savings outcomes for many employees. A number of studies have shown that AE has significantly increased employee participation in DC plans (Beshears et al., 2010a; Choi et al., 2002, 2004; Madrian and Shea, 2001).

Employers who sponsor a DC plan that features AE choose a default contribution rate and investment allocation for their automatically enrolled employees. Employees enrolled in such plans have a percentage of their salary automatically deducted from their paycheck, according to the plan's default contribution rate, which is then invested in the plan's default investment allocation. These default settings are enacted unless an employee actively chooses an alternative contribution rate and/or investment allocation. Increasingly, plan sponsors have been selecting target-date funds (TDFs) as the default investment, which are funds that automatically shift a portfolio's allocation over time from heavier to lighter equity shares as a predicted retirement date approaches. By 2010, 70 percent of DC plans offered TDFs, 36 percent of all DC plan participants held positions in these funds, and the rise of TDFs as the default fund has led to significantly higher equity ownership for many employees, particularly younger employees (Mitchell and Utkus, 2012).

However, a substantial fraction of AE participants actively opt out of their employer's default investment portfolio and/or contribution rate to elect a new portfolio or rate, or not to participate altogether. Relatively little is known about what types of employees are most likely to be such "active participants," and how this choice is impacted by plan features. Plan features may be important factors influencing whether participants elect to stick with their plan's default contribution rate and investment portfolio. For example, participants in plans that feature immediate vesting of employer contributions may feel more ownership of their retirement funds and more likely to select their own investments than participants in plans where employer contributions vest gradually. Furthermore, little is known about whether such active participants tend to take on more investment risk, and how their portfolio returns compare with those who remain with the plan's default fund. Greater understanding of active participants, their characteristics, and their retirement saving behavior can help plan sponsors understand whether plan features and defaults are appropriate for their participants.

A recent Vanguard (2014) analysis of seven large DC plans found that whites and Asians are more likely to override the default deferral rate than blacks and Hispanics, and that being automatically enrolled into a default TDF reduces variation in risk-taking across racial and ethnic groups (Pagliaro and Utkus, 2014). Agnew et al. (2007) examine survey and administrative data from three employer-sponsored plans and find that individuals with low financial literacy and low levels of trust in financial institutions are more likely to opt out of participating in a plan in which they were automatically enrolled. Choi et al. (2004) examine data from three companies and find that highly compensated and older individuals are more likely to opt out of plan default settings. They also find that tenure is negatively associated with staying with the default, particularly the default contribution rate, as individuals move away from the initial settings over time. However, defaults appear to be sticky for a substantial fraction of participants: approximately 40 – 54 percent of Choi et al.'s (2004) sample remains at both the default contribution rate and default investment after two years of tenure. Beshears et al. (2010b) examine data from a unique plan in the UK that implements a relatively high default deferral percentage of 12 percent. They find that participants in this plan are less likely to stay with the default – by 12 months of participation, three quarters have elected a different rate – than participants in plans examined by Choi et al. (2004), suggesting that larger default contribution rates may be associated with more participants opting out.

In this paper, we take a more comprehensive look at who elects to opt out of plan default settings. We use administrative data from Vanguard, a large financial services firm that offers IRA and 401(k) savings and other financial products. We analyze data on approximately 100,000 newly hired employees eligible for 206 unique employer-sponsored retirement savings plans featuring automatic enrollment. In addition to examining what demographic and financial characteristics are associated with choosing a different contribution rate or investment portfolio, the large number of plans in our data allows us to examine which plan features (such as automatic escalation in default contribution rates, immediate vesting of employer contributions, or default contribution rates below a match cap) are associated with overriding default settings. In particular, in this project we:

1. Characterize what types of employees are most likely to be "active participants;"
2. Investigate whether active participants increase or decrease contributions and take on greater or lesser risk by moving away from their plans' default settings;
3. Examine which plan features are associated with moving away from the default contribution rate and investment portfolio; and
4. Tentatively explore how active participants' portfolios perform in comparison to their passive counterparts.

We find that a majority of participants (59%) elect a contribution rate and/or investment portfolio that differs from their plans' default settings within the first four years of participation, and that these "active participants" tend to contribute at higher rates and hold less equity than their passive peers. In particular, among those that select a different contribution rate, roughly two thirds increase their contribution rate above that specified by their plan while another third decreases their contribution rate below the default. When we compare investment returns, we see that participants who choose an investment portfolio different from their plan's default end up with slightly worse portfolio returns than do their more passive investor counterparts, though this result is largely driven by the high overall market performance during the time period covered by our data.

Women and higher income participants are somewhat more likely to choose a contribution rate that differs from the default, while men and higher income participants are more likely to choose their own investment portfolio than their respective counterparts. Plan features are also important predictors of becoming "active." Of the plan features for which we have data, participants in plans that set the default contribution rate below the match cap or in plans that set a default contribution rate above 3 percent (the median default rate in our sample) are more likely to choose a contribution rate that differs from the default. The importance of plan features in affecting the likelihood of participants to adjust their contribution behavior suggests plan designers should take careful consideration of these elements if maximizing employee welfare in retirement is a motivation.

Section 2 below describes our data. Section 3 defines and identifies active participants and examines how their contribution and investment behavior compares with that of their passive peers. Section 4 examines demographic differences between active and passive participants and Section 5 examines differences between these groups in terms of plan-level characteristics. Section 6 examines which demographic and plan level characteristics are predictive of becoming active in a multivariate framework, while Section 7 concludes.

2. Vanguard Data

To investigate our research questions, we used data that were provided by Vanguard on an anonymous and secure, restricted-access basis.

The data that we use cover 316,286 newly hired employees across 384 plans, hired between January 1, 2010 and December 31, 2013, and who are still actively employed as of June 30, 2014. Because our analyses focus on AE participants who opt out of their plan's default options, we exclude 192,198 employees who are eligible for only voluntary enrollment (VE) plans.[1]

[1] 155 of our 384 plans are VE and are excluded from any plan-level analysis.

Among the 206 plans featuring AE in our remaining sample, roughly a quarter (51) adopted their AE policy since 2010; we therefore exclude a total of 13,337 employees who were hired by one of these 51 plans before it switched to AE. We also drop from our sample 8,369 employees who were eligible for one of the 23 AE plans that made changes to their plan design, such as changes to default contribution rates, in the 2010-2014 timeframe, because we do not know the precise dates of these changes. Our analysis sample, therefore, is comprised of 206 AE retirement plans and 102,382 employees who were hired between January 1, 2010, and December 31, 2013, are still actively employed as of June 30, 2014, and are eligible to participate in plans featuring AE. Table 1 describes our final sample size and shows that 94 percent of new hires in our sample ever participate in (positively contribute to) their employer's DC savings plan with AE features during our window of analysis.

Table 1: Sample Size

All AE Plans	
Number of plans	206
Number eligible employees hired 2010-2013 AND still employed by June 30, 2014	102,382
Number newly hired employees ever participating in plan	95,783
Participation rate among newly hired employees	93.6%

At the plan level, our data include details on plan design such as enrollment rules, the default fund investment, the default contribution rate, any automatic escalation rules, whether the plan features any kind of employer match and contributions, and the plan's rules on account balances for separated employees.

At the individual level, we observe participation statuses, contribution rates, contribution amounts, account balances, and investment classes, on a monthly basis from the date of an employee's hire starting as early as January 1, 2010, through June 30, 2014, the last date for which we observe investment and contribution behavior. Other employee-level information contained in these data include age, yearly income level, tenure with the employer (maxed at 4.5 years in our data), and termination dates for those who leave employment (though our sample focuses on those who are still employed as of June 30, 2014). We unfortunately lack other financial information, including whether they participate in other retirement savings accounts, including defined benefit (DB) plans or IRAs.

Table 2 describes the 206 AE plans in our sample. On average, plans in our sample cover approximately 3,000 employees, approximately 1,000 of whom have been hired since 2010. Only about half of these new hires are still employed at the end of sample period, and we focus on these new hires for our analysis.

In addition to automatically enrolling new employees, 79 percent of plans in our sample also automatically enroll participants in an automatic escalation feature. Under these plans, participants' contribution rates automatically increase every year up to a certain level set by the plan.[2] Participants can opt out of automatic escalation if they wish. An additional 15 percent of AE plans are voluntary automatic escalation plans, plans that offer an automatic escalation feature into which participants must actively enroll.

Across plans, the average initial default contribution rate is 3.5 percent.[3] Over 90 percent of employer plans in our sample offer matching contributions, and 97 percent of employees are eligible for plans that feature an employer match. Interestingly, 81 percent of employees are eligible for an AE plan whose initial default deferral percentage fails to take full advantage of the associated match formula (e.g., the plan will match up to 6 percent but has a default contribution rate of 3 percent). Approximately 40 percent of plans immediately vest employer contributions, and nearly all plans feature a target date fund (TDF) as the default investment (98 percent).

Table 2: AE Plan Characteristics

	Plans	Employees
Mean number of total employees	3,024	N/A
Mean number of new hires 2010-2013	993	N/A
Participation rate among new hires	93.6%	93.6%
Has automatic escalation (default)	78.7%	79.4%
Has automatic escalation (voluntary)	15.1%	13.6%
Mean initial default contribution rate	3.49%	3.49%
Has an employer match	90.3%	97.0%
Initial default contribution rate less than match cap[4]	67.6%	81.2%
Plan offers immediate vesting of employer contributions	40.6%	44.0%
Default fund is Target Date Fund	97.6%	98.3%

Table 3 presents demographic characteristics of employees in our sample for analysis divided between participants and non-participants. Average earnings of participating employees is approximately $66,000, considerably higher than the average earnings of employees who are eligible to participate but elect to opt-out ($44,000).[5] Average tenure for participating employees

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[2] 161 of these plans use an automatic annual increase of 1 percentage point while 2 plans use a 2 percentage point automatic escalation.

[3] The median and modal default contribution rate is 3 percent, with a range between 1 and 7 percent. 60 percent of participants have a default contribution rate of 3, 10 percent have a default less than 3, and 30 percent have a default above 3.

[4] Excludes 13 plans for which the match cap cannot be determined.

[5] Median household earnings for Americans in 2014 were $53,657 (DeNavas and Proctor, 2015).

is slightly longer than that of those who choose not to participate (2.1 years vs. 1.9 years),[6] though age and gender characteristics are similar across the two groups.

Table 3: Employee Demographic Characteristics, Non-participating vs. Participating Employees

All AE Plans		
	Non-Participating Employees	Participating Employees
Annual Earnings	$44,059 ($35,438)	$65,895 ($55,024)
Tenure in years	1.95 (1.78)	2.05 (1.90)
Age	38.3 (35.5)	38.5 (36.4)
Percentage Male	53.4%	53.5%
Percentage Female	31.3%	34.3%
Gender Unknown	15.1%	12.3%
N	6,599	95,783

NOTE: Data are presented as means, with corresponding medians in parentheses. Data are as of June 30, 2014 except for income, which is 2013 income. All differences across participants and non-participants are statistically significant at 1% level in two-sided t-tests except for age (p-value =0.21) and percentage male (p-value =0.90).

3. Active Participants

We define a participant as someone who has ever contributed to his employer's DC plan, and we define an *active participant* as someone who has elected to move away from the plan's default settings. Therefore, we classify employees into one of three groups:

- Passive participants always contribute at the plan's default rate and invest in the plan's default investment portfolio.
- Active participants elect a different contribution rate and/or a different investment portfolio from the plan's default at least once.
- Non-participants never make contributions to the plan (6 percent of our sample).

We first discuss participants who elect a different contribution rate from the plan's default. We describe how we define these *active contributors*, how we classify them using our data, and

[6] The maximum possible tenure we can observe in our data is 4.5 years.

we look at how often we observe participants choosing a different contribution rate from the default. Next, we look at their average contribution rates and how they compare to passive participants.

We then turn to participants who elect a different investment portfolio than that set as the default by their plans. We describe how we define these *active investors*, and we look at the percentage of participants who choose a different investment portfolio from the default. We then compare the amount of equity that these active participants hold in their retirement accounts and how it compares to that of passive participants.

Table 4 summarizes the types of participants that we will focus on in our analyses. Note that a participant can be both an active contributor and an active investor; these categories are not mutually exclusive. For our purposes we do not include non-participants in our analysis.

Table 4: Summary of Participant Types

Type of Participant	Definition
Participant	An eligible employee who has ever made a contribution to his employer-sponsored DC plan
Passive Participant	A participant who always contributes at the plan's default rate and invests in the plan's default investment portfolio
Active Participant	A participant who ever elects a different contribution rate and/or a different investment portfolio than the plan's default.
Active Contributor	An active participant who ever elects a different contribution rate than the plan's default.
Active Investor	An active participant who ever elects a different investment portfolio than the plan's default.
Complete Active	An active participant who ever elects a different investment portfolio AND who ever elects a different contribution rate than the plan's default settings

Active Contributors: Participants who elect a different contribution rate

Active contributors contribute either more or less than the default contribution rate set by their plan's design at any point after they begin participating in the plan. For participants in plans without an automatic escalation feature, or in plans with a voluntary automatic escalation feature, classifying active contributors is straightforward as this default contribution rate does not change over time. For both these types of plans, we classify participants in these plans as active contributors if their contribution rate ever differs from the plan's initial default contribution rate.

For participants in plans that automatically enroll participants into an automatic escalation feature, there is not a plan-wide default rate that is constant over time. Calculating the default contribution rate that each participant faces under these plans is more complicated because it also depends on the employee's tenure, since the default contribution rate rises over time automatically under automatic escalation (unless the participant chooses to opt out of this feature). However, in our data, the timing of these automatic escalations in the default contribution rate is not consistent across plans or even across participants. Some plans implement automatic increases at an employee's anniversary of work hire, anniversary of the employee's eligibility for plan participation, or anniversary of the employee's first contribution. Other plans may implement automatic escalations at a universal plan-wide annual date, or even a participant-elected annual date. Furthermore, plans also differ in "lag time" between the annual escalation date and when the automatic escalation is actually implemented. Unfortunately, we do not have access to plan rules on timing of the implementation of automatic escalations. This makes defining an active contributor in these plans challenging, as it is difficult to compute the default contribution rate that a participant faces over the sample period.

We employ the following methodology to account for this complexity. For participants in plans that automatically enroll participants in automatic escalation, we classify active contributors depending on the date on which he or she started making contributions to the plan (we refer to this date as his date of initial participation). Specifically, for each participant in these plans, we allow that the plan's automatic escalation may be exercised any time during the first 15 months of participation. Therefore, we allow that the participant's default contribution rate in the first 15 months of participation may be either the plan's initial default contribution rate, or the plan's initial default contribution rate plus the auto-escalation factor (most often 1), because we do not know when exactly auto-escalation begins. After the first 15 months, we assume that the participant's default contribution rate is automatically escalated on an annual basis. In other words, his default contribution rate is his contribution rate from 12 months prior, plus the automatic escalation factor. It is important to note that this method will slightly undercount anyone who actively raises his or her contribution by one percentage point in the first 15 months of participation that was not automatically scheduled (if under a plan with an automatic escalation factor of one percentage point).

To illustrate, consider an employee who begins making contributions to her account in April, 2011. The plan has a default initial contribution rate of 3 percent of salary, and an auto-escalation factor of 1 (meaning each year the contribution rate rises by an additional 1 percentage point). Because we do not have the plan rules on timing of automatic escalations, we do not know when her contribution rate will be escalated—for example, her contribution rate could be escalated in January 2012 if her plan uses an annual January escalation date, or her contribution rate could be escalated in April 2012 if her plan uses an escalation date that occurs on the anniversary of her first contribution. However, her contribution rate could also be scheduled to increase in April, but perhaps due to programmatic delays is implemented a few months behind schedule. In this scenario, we allow that the employee's default contribution rate could be either 3 or 4 for the first 15 months of her tenure, from April 2011 through June 2012. In July 2012, 16 months after she started making contributions, we assume that her default contribution rate should be whatever her contribution rate was in July 2011, plus the 1 percentage point auto-escalation factor. Thus, if in July 2011 she contributed 3 percent, we assume in July 2012 her default contribution rate is 4 percent. However, if she contributed 4 percent in July 2011, we assign her default in July 2012 at 5 percent. This method allows for a degree of forgiveness to small early changes in contribution rates and timing of automatic escalation that we do not consider evidence of being "active."

Table 5 shows that 57 percent of AE participants in our sample actively elect a contribution rate that differs from their assigned default rate at some time during their tenure. Participants in a plan with automatic auto-escalation most likely (59 percent) choose a different contribution rate. More than half of participants in plans that do not offer automatic escalation and almost half of participants in plans that offer a voluntary auto-escalation option choose a contribution rate different from the plan default.

Table 5: Percentage of Active Contributors, by plan automatic escalation rules

Plan Automatic Escalation Rule	Active Contributors
No Auto-Escalation (5% of plans)	55.2%
Automatic Auto-Escalation (80% of plans)	58.5%
Voluntary Auto-Escalation (15% of plans)	48.6%
Overall	56.9%
N	95,783

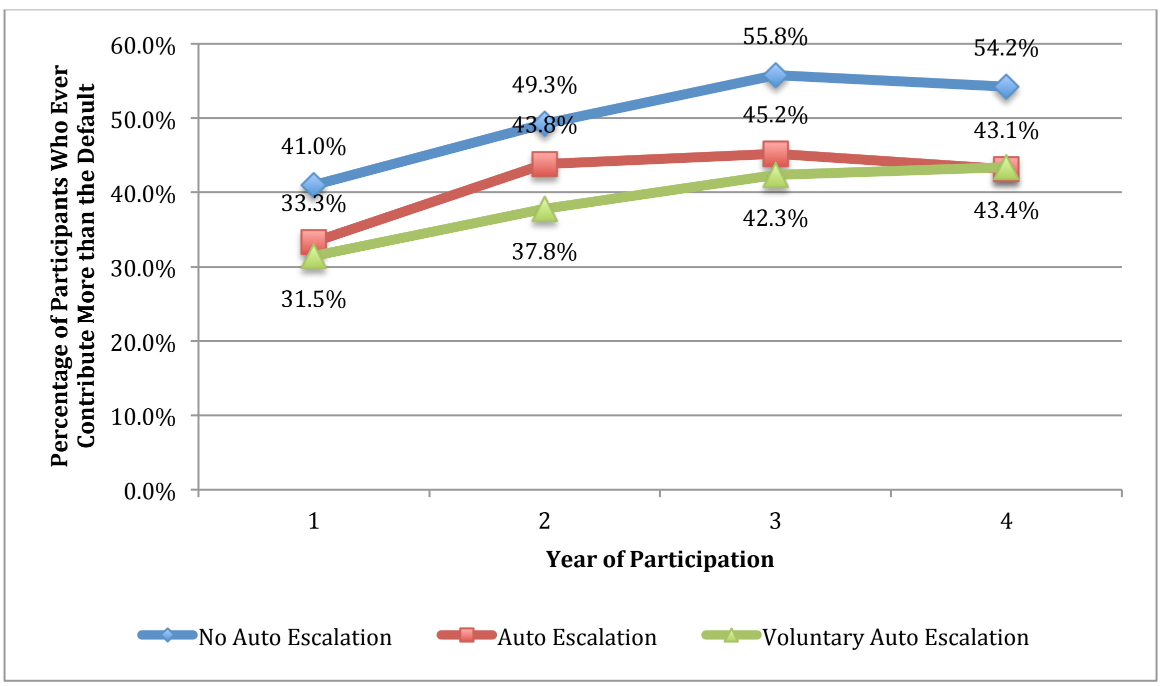
While Table 5 presents the frequency with which we observe participants who actively choose a different contribution rate at some point over our entire period of observation, we can also observe *when* participants adjust their contribution rates. One quarter of participants in our sample initially choose a contribution rate other than the plan's default contribution rate (not shown in table). We find that 31 percent of participants in plans without automatic escalation choose a contribution rate different from the plan's default contribution rate at their initial participation date. For participants in plans with automatic and voluntary escalation, the corresponding numbers are 25 percent and 23 percent, respectively.

Another natural question about the behavior of active contributors is whether these active contributors are contributing more than the default contribution rate or less than the default, and whether there are differences in the frequency of choosing a different contribution rate over time as employees gain tenure.

Overall, 41.5 percent of all participants ever contribute more than their plan's default contribution rate at some time during their tenure. However, there are important differences in the likelihood of contributing more than the default, depending on the plan's auto-escalation rules and the participant's tenure in the plan. Figure 1 first looks at the frequency with which we observe participants choosing a contribution rate *greater than* their default as participants gain tenure. We see that the likelihood of choosing a higher contribution rate than that assigned by the plan is higher in the first year of participation under plans without an automatic escalation feature than in plans with an automatic or voluntary auto-escalation. In plans with no auto-escalation, 41 percent of participants ever contribute more than the plan default during their first year of participation. About one-third of participants (33 percent and 31 percent, respectively) in plans with automatic or voluntary auto-escalation contribute more than the plan's default contribution rate sometime during their first year of plan participation.

The likelihood of contributing more than one's default increases over an employee's tenure for plans that do not automatically enroll participants in automatic escalation, but after the first year, it stays about the same for plans that do automatically enroll participants in automatic escalation. We find that 54 percent of participants in plans without an automatic escalation feature will at some point in their fourth year of participation contribute more than their plans' default, compared to 43 percent of those under auto-escalation plans contributing more than their default (where the default has now increased over time for these plans). When we examine the frequency of contributing more than the default by year of initial participation cohort (as well as by given year of participation), we do not see important differences between cohorts. Table A1 in Appendix A presents these findings.

Figure 1: Rates of contributing more than the default contribution rate in a given year of participation



Contributing less than one's default is less common than contributing more than one's default in our data. Overall, 22.6 percent of participants ever contribute less than their plan's default contribution rate at some time during their tenure. Note that stopping or skipping two or more consecutive monthly contributions will qualify as contributing less than the default, because all plans feature automatic enrollment in our sample.[7] As we saw with participants who contribute more than the default, there are important differences in likelihood of contributing less than the default, depending on the plan's auto-escalation rules and on the participant's tenure in the plan. Figure 2 shows the corresponding results for rates of contributing *less than* one's default, by year of tenure and by plan auto-escalation policy. There is a clear discrepancy across plans with an automatic auto-escalation feature and plans with either voluntary or no auto-escalation policies. Though participants have roughly similar rates of contributing below the default in the first year of tenure across policies (ranging from 8 percent to 11 percent), those whose plans' default contribution rates automatically rise over time become much more likely to contribute less than the default as they gain tenure (from 11 percent in year 1 to 42 percent in year 4). Those whose plans' default rates stay constant over time are about equally likely in any given year of tenure to have ever contributed less than the default. Again, we do not see important differences between year of initial participation cohorts when we examine the frequency of contributing less than the default by participation cohort as well as by given year of participation (see Table A2 in Appendix A)

[7] To be conservative in defining skipping behavior, we restrict to two or more missing consecutive monthly contributions and do not consider one missing month of contribution information to comprise a skip (in case this is simply an error in the data).

Figure 2: Rates of contributing less than the default contribution rate in a given year of participation

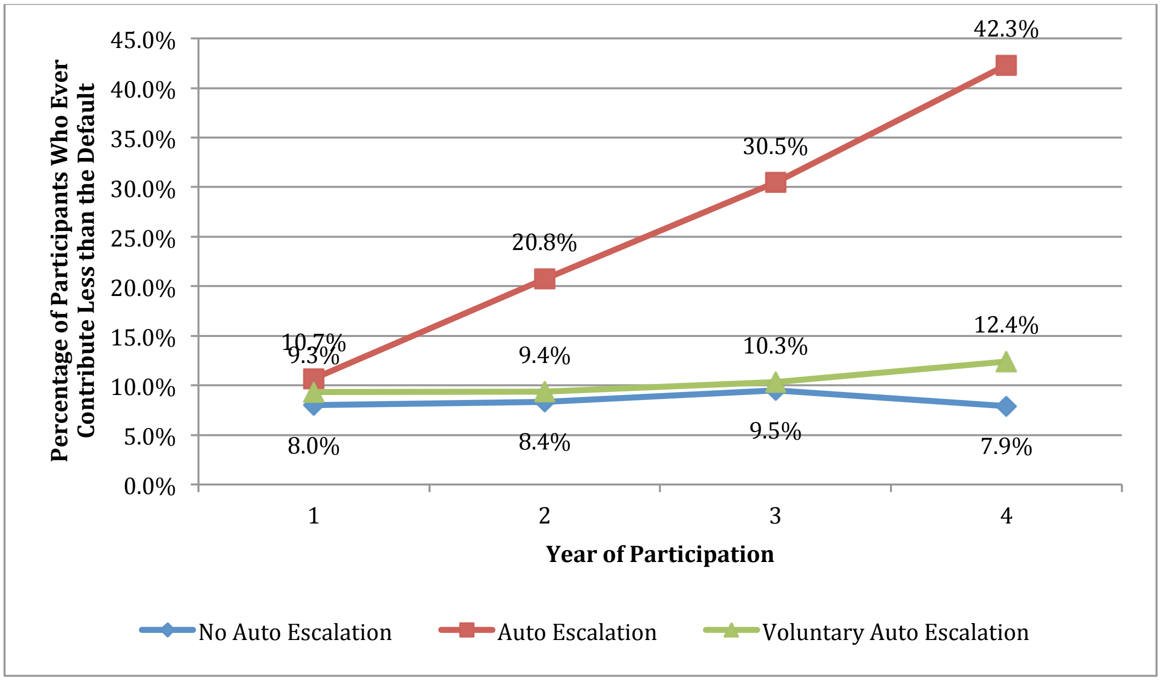
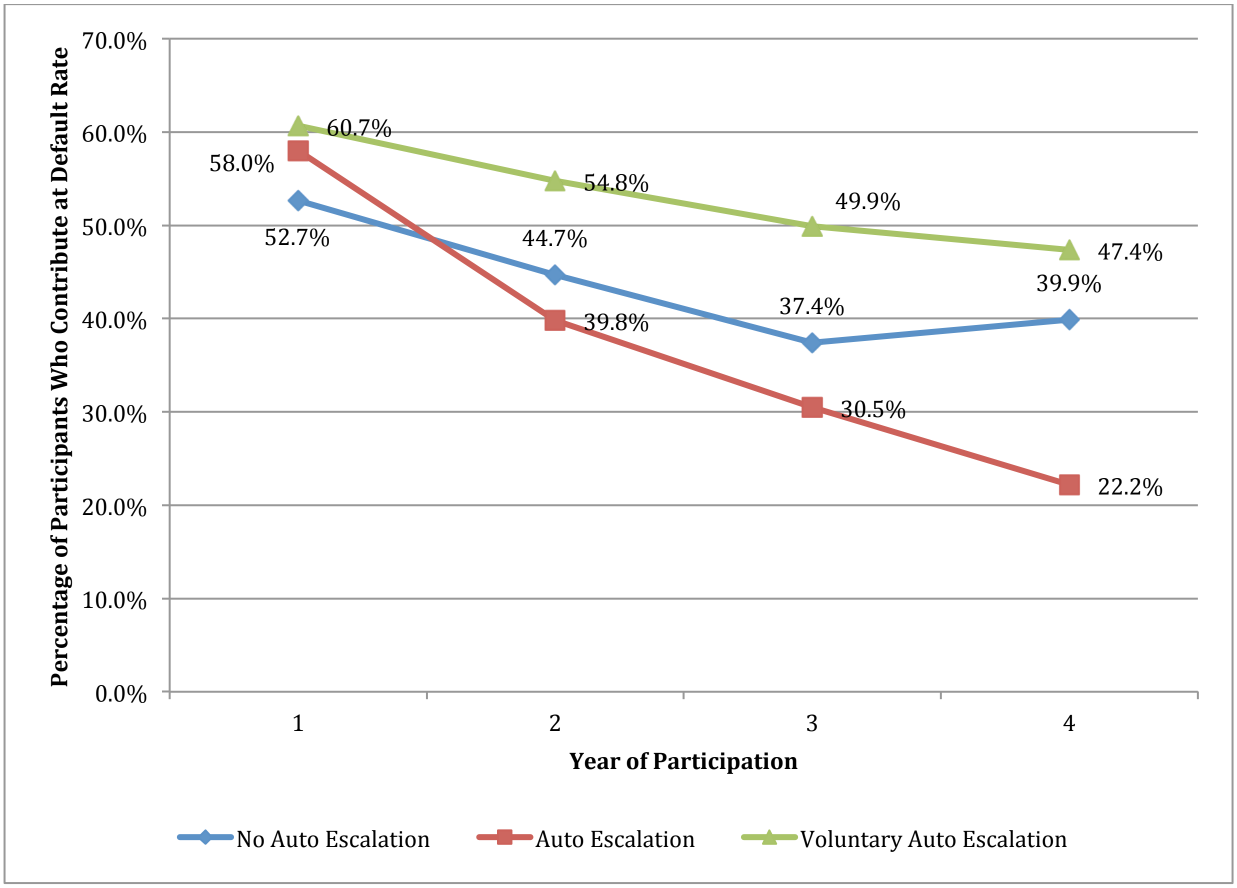


Figure 3 presents the set of results for those who always contribute at the default rate for their plan, by year of participation. While a participant can qualify as contributing both more and less than the default in a given year of participation (if, for example, his plan's default rate is 3 percent in a given year and he contributes 2 percent one month and 5 percent in another), Figure 3 presents rates of those who *never* contribute anything other than their plan's default in a given year of participation. It shows less drastic changes than Figures 1 and 2 as employees gain tenure, but an overall negative trend away from staying at the default as employees gain tenure. As expected given the overall higher rates of being "active" under plans with automatic auto-escalation policies, rates of being "passive" become lowest under these plans, starting at 58 percent in the first year of contributing and declining to 22 percent after four years. Roughly half of participants in plans with no escalation remain at the default across all years of tenure, declining from 53 percent to 40 percent from the first to the fourth year of contributing, while between 60 and 47 percent of those under voluntary auto-escalation remain at their plans' assigned defaults across years of contributions. As with frequency of contributing more than the default and frequency of contributing less than the default, when we examine the frequency of always contributing at the default by year of initial participation cohort as well as by given year of participation, we do not see important differences between cohorts (Table A3 in Appendix A).

Figure 3: Rates of always contributing at the default contribution rate in a given year of participation



Contribution Rates of Active Contributors

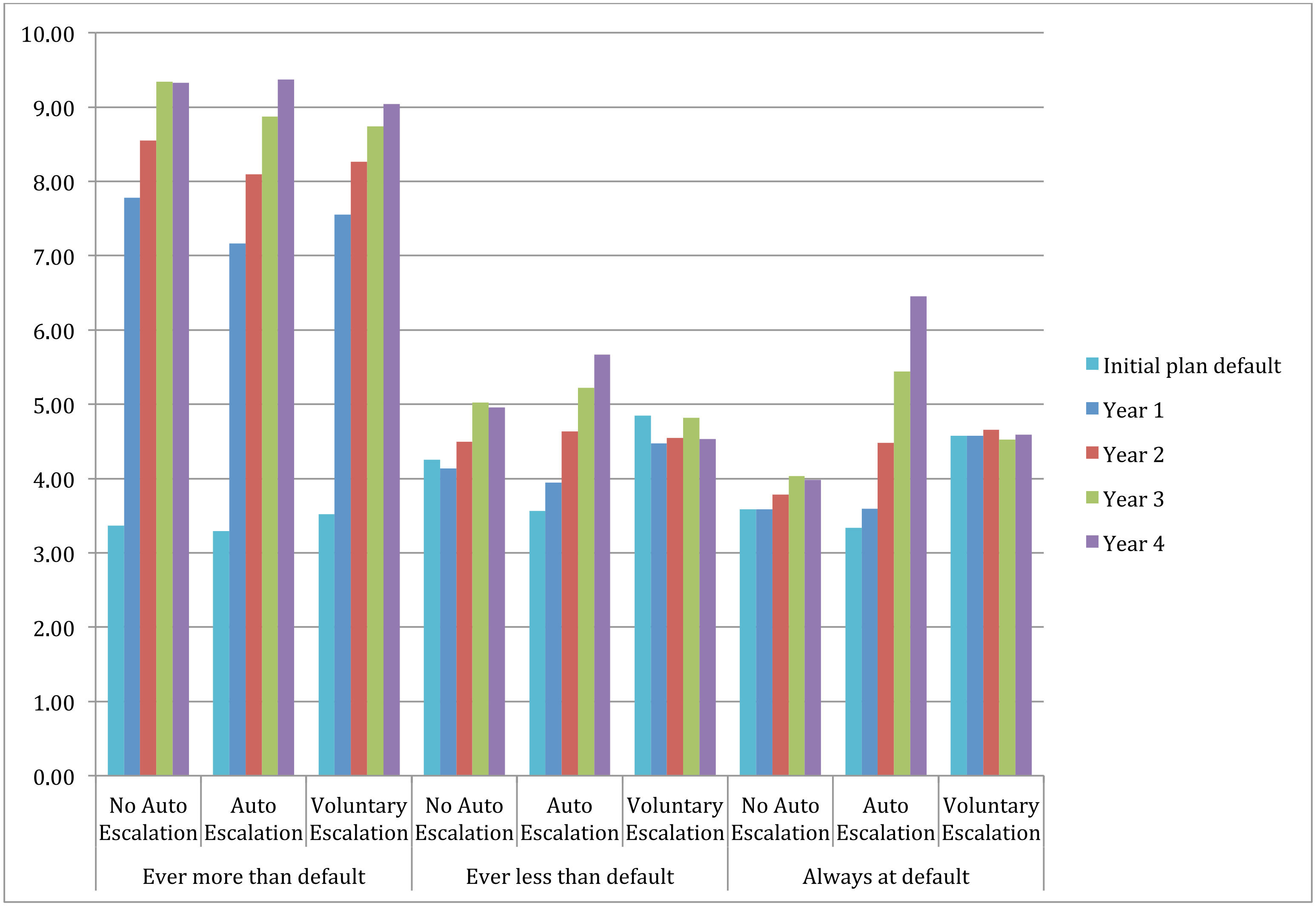
We next compare contribution behavior of active and passive contributors across plan automatic escalation policies. Over the timeframe of our data, those who ever contribute above their default have an average contribution rate of 8.29 percent, and those who ever contribute less have an average contribution rate of 3.98 percent. Passive contributors – those who always contribute at their plan's default - have an overall average contribution rate over their tenure of 4.32 percent. But there are important differences in contribution rates depending on plan escalation rules and on participation tenure.

Figure 4 shows the mean contribution rates among those who ever contribute more, ever contribute less, or always contribute their plans' default contribution percentage, respectively. As expected, mean contribution rates are highest among those who ever contribute more than their plan's default, under any plan escalation rule. Note that those who ever contribute less have plans with higher initial default contribution rates than those who always contribute at the default. And likewise, those who always contribute at the defaults have plans with higher initial default contribution rates than those who contribute more than their defaults. Those who ever contribute above their default tend to increase their contributions by quite a bit. For example, those under plans with no auto-escalation or voluntary escalation that increase their contribution rates do so by an average of 3.4 percentage points. Mean contribution rates are roughly equal among those who always stay at their plan's default and those who contribute less.

Figure 4 also shows that mean contribution rates generally rise as employees gain tenure. For those under automatic escalation policies, some part of this result is mechanical as these participants face a rising default rate over time, but even among those who ever contribute less than their plan's default, we see mean rates rise with tenure, suggesting they may not be totally escaping the automatic increases in their plan's default. Those whose plan default rates never change see somewhat less variation across years of tenure. In fact, we see that participants in plans with no auto-escalation or voluntary auto-escalation initially contribute more than those in plans with automatic auto-escalation. However, by the fourth year of participation, participants in plans with automatic auto-escalation contribute more than participants in the other types of plans.

Finally, for those whose plans have a known maximum rate at which contributions will be matched by employer contributions, we find high rates of contributing at or above this match cap. Specifically, 59% of those under no automatic escalation ever contribute at or above their plan's match cap, 65% of those under automatic auto-escalation, and 69% of those under voluntary escalation ever contribute at or above their plan's match cap, for an overall rate of 65%. Fully 93% of those who ever contribute more than their plan's default contribute at or above their plan's match cap, with little difference across automatic escalation policies.

Figure 4: Mean contribution rates by year of eligibility and plan escalation rule



Active Investors: Participants who elect a different investment portfolio

AE plans also designate a default investment in which participants' contributions will be invested. Some plans have different default investments depending on whether the contributions are employee contributions or employer contributions. For this report, we focus on default investments for employee contributions. For our total sample of participants across 206 plans, 98 percent are covered by a plan that uses a target date fund (TDF) as the default investment for employee contributions. The remaining 2 percent participate in a plan that employs an "other balanced fund" as the default.

Participants who ever elect an investment portfolio that differs from their plan's default are labeled *active investors*. While we are unable to observe the specific underlying assets (e.g. individual stocks) participants in our data hold, we can observe whether participants are entirely invested in their default investment class, e.g. whether they have 100 percent of assets in a TDF or "other balanced fund." Thus, we define a participant to be an active investor if they ever hold assets outside their default investment class.[8]

In Table 6 below we summarize the rates of being an active investor across participants in our sample and the associated equity shares for passive and active participants. In contrast to the high rates of active contributors moving away from their plans' default contribution rate, the vast majority of participants in our sample (83 percent) elect to stick with the default investment. In our data, we observe the share of participants' balances that are invested in equities. Overall, the 17 percent of our sample that comprise active investors tend to hold slightly lower equity shares on average over our window of analysis (as measured by the fraction of funds invested in equities) than those invested in their plans' defaults, as shown in Table 6. However, active investors are a few years older on average than passive investors, contributing to the disparity in equity shares (since older participants in TDFs will hold less equity, all else equal).

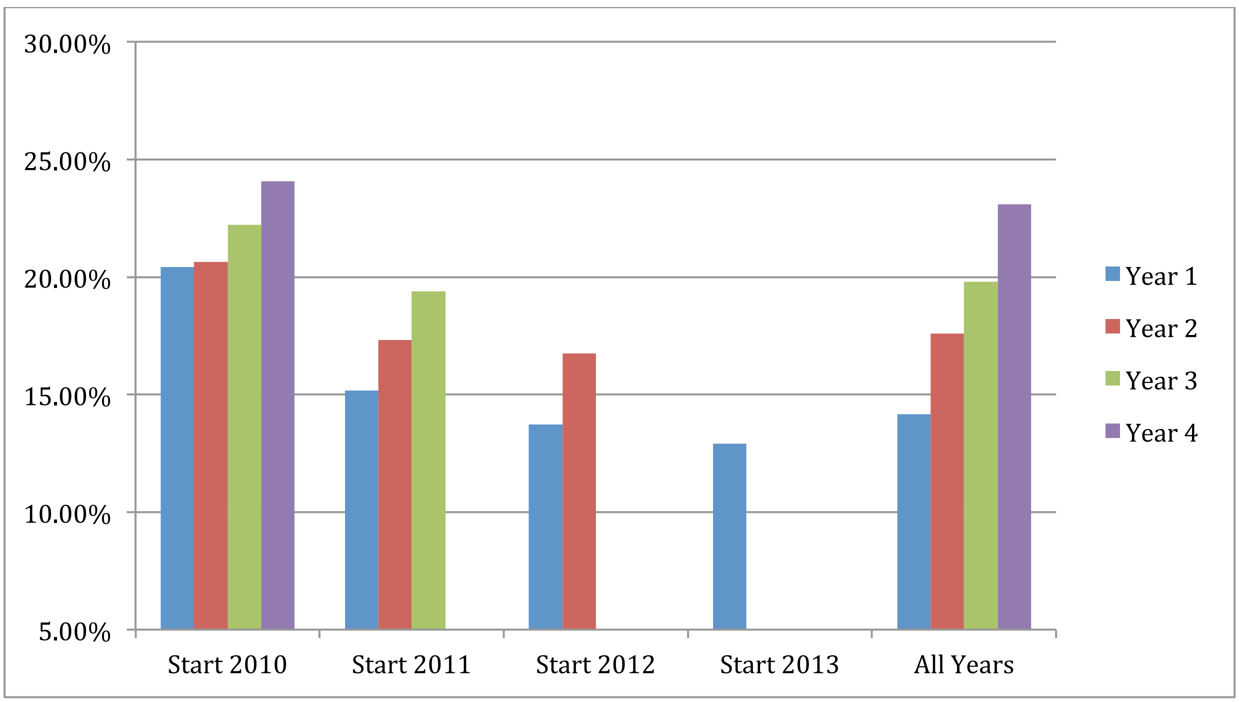
Table 6: Employee Demographic Characteristics, Active Investors vs. Passive Investors

All AE Plans			
	Active Investors	Passive Investors	All Participants
Fraction of participants	17.1%	82.9%	100%
Mean Equity Share	78.1%	82.6%	81.8%
Mean Age	41.0	37.9	38.5
N	16,379	79,404	95,783

[8] Note that participants that choose a different investment within the default investment class are not defined as active investors. In particular, if a participant were to be defaulted into a TDF 2040 fund and instead invest in a TDF 2045 fund, they would not be considered active. Our data do not permit us to identify the prevalence of such behavior, but these participants are still electing to stick with the default type of investment.

Figure 5 shows that the fraction of participants who are active investors increases with tenure, similar to findings for active contributors above. Figure 5 also breaks down results by participation start year cohort. Interestingly, over time the fraction of participants who are active investors in any given year of participation has decreased. For example, in their first year of participation, approximately 20 percent of AE participants from the 2010 cohort were active participants, while 15 percent, 14 percent, and 13 percent of participants were active investors in their first year from the 2011, 2012, and 2013 cohorts respectively. This finding is consistent with the possibility that participants were more interested in conservative portfolios immediately following the great recession, yet became more willing to hold TDFs over time.

Figure 5: Fraction of Participants who are Active Investors by Participation Start Year



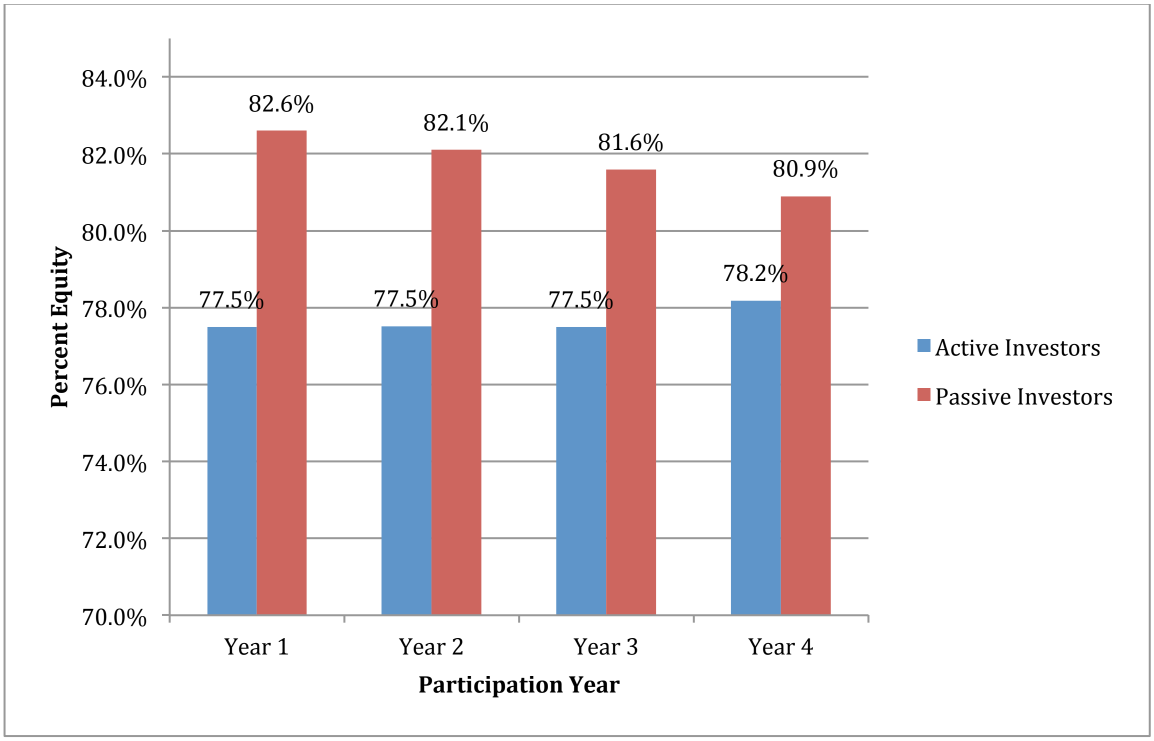
Differences in behavior between active and passive investors

As noted in Table 6 above, active investors tend to hold a lower fraction of their investment allocation in equities than do passive investors. Figure 6 confirms that this relationship holds in every year of our data.[9] Average equity allocation increases slightly over time from 77 percent

[9] The relationship between median equity percentage between the two groups is very similar.

to 78 percent for active investors, but remains uniformly lower than that held by passive investors. Passive investors' equity percentage falls slightly over time as participants' TDFs rebalance.

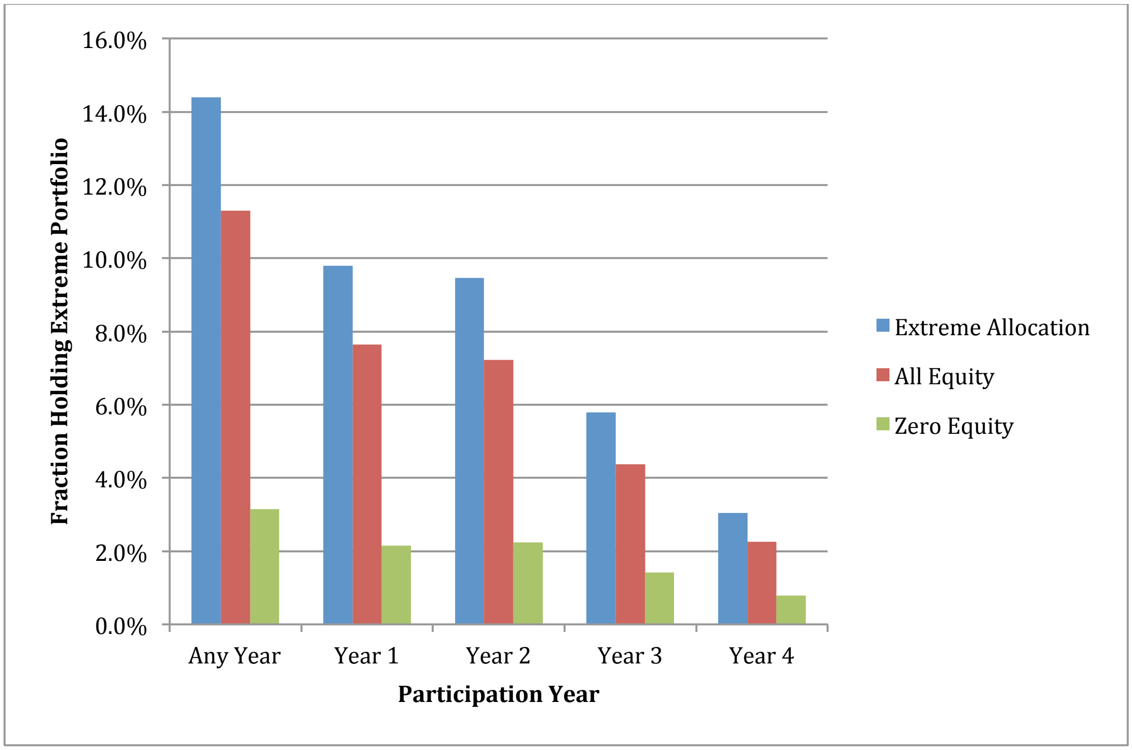
Figure 6: Average Equity Percentage, Active vs. Passive Investors



By construction, TDFs distribute participants' contributions across asset classes (though the majority of investments are held in equities amongst our relatively young sample). It is of interest to examine what fraction of active investors are choosing to construct less balanced portfolios. While we do not observe the default level of equity assigned to any individual participant, by construction TDFs are balanced across asset classes. Thus we examine what fraction of AE participants elect to hold portfolios that are certainly not inherent to TDFs, particularly portfolios comprised of either 100 percent or 0 percent equity.

Figure 7 below shows that approximately 14 percent of active investors hold an "extreme" portfolio comprised of ether 100 percent or 0 percent equity at some point in our data. This rate is largest in the first year of an active investor's eligibility, then declines with tenure. Approximately three-quarters of those who choose an extreme portfolio elect to put all of their contributions into equities. Given that only 17 percent of all participants are active investors, only approximately 2 percent of participants ever hold an extreme portfolio during our window of analysis.

Figure 7: Fraction of Active Investors Holding an Extreme Portfolio by Year of Participation

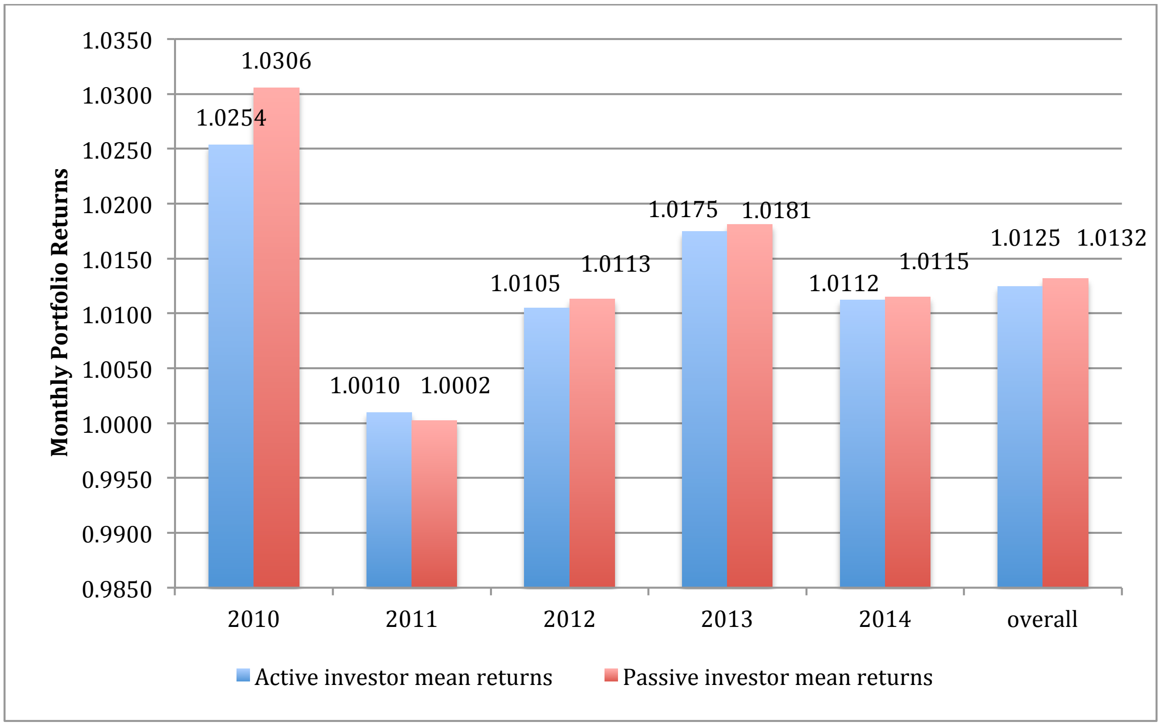


How do portfolio returns of active investors compare to their passive counterparts?

We see in our data that 17 percent of AE participants are active investors that choose a different investment portfolio than their plan's default. A natural question to ask is how the portfolios of these active investors perform in comparison to their more passive counterparts. Ideally, one would compare the relative ex-ante efficiency of the portfolios chosen by active investors with their plans' default allocations. Unfortunately we lack information about the specific underlying assets (e.g. individual stocks) participants in our data hold and cannot evaluate portfolio efficiency. Instead, we examine differences in ex-post returns. While this analysis provides insights into whether active investors experienced improved returns relative to their passive peers, it does not provide insights into whether active investors were choosing (ex-ante) more efficient portfolios.

We use information on total monthly portfolio returns for each investor and compare across active and passive types. We calculate the annual means of these monthly returns, and compare them for each participant during their observed tenure. Figure 8 below presents results by year and overall for these mean monthly returns across active and passive investors. Mean overall monthly returns across all years are 1.013, though we see that 2011 had the lowest overall monthly average returns among all years considered. We find that 2011 is also the only year in which active investor portfolios outperform those of their passive peers, though the difference is very small, at 0.07 percent. Across all years 2010-2014 (where we have information on just the first six months of 2014), passive investors – those that stay with their plan's designated default investment portfolio – slightly outperform their more active counterparts, with average returns of roughly 1.013 percent compared to 1.012 percent, a very small difference of 0.07 percent, but statistically significant.

Figure 8: Portfolio Returns, Active versus Passive Investors



Notes: Differences across active and passive returns are statistically significant at conventional levels for each year and overall based on two-sided t-test.

While this analysis is restricted by the nature of our data to a short-run ex post comparison of average returns by investor type during the time period covered by our data, the results in Figure 8 align with our findings that active investors tend to take on less equity (Figure 6) since the years covered by our data (2010-2014) experienced strong stock market performance, with the exception of 2011 as noted above.

Correlations between active investors and active contributors

Our results so far show that in our data, active contributors are very common with 57 percent of AE participants choosing a contribution rate different from the plan default contribution rate.

Active investors are much less common, with only 17 percent of AE participants choosing an investment portfolio different from the plan's default. We now explore whether these behaviors are correlated. In Table 7 we examine correlations between being an active investor and an active contributor. A plurality (42%) of AE participants elected a contribution rate different than the default, but elected to stay with the default investment; only 15% of AE participants are both active contributors and active investors. This suggests that changing one's contribution from the plan's default setting is much more prevalent than is changing one's investment portfolio from the plan's default.

We find that there is a positive correlation between becoming an active contributor and an active investor (corr = 0.26). Conditional on becoming an active contributor, 26 percent of AE participants also become active investors. Only 6 percent of passive contributors become active investors. Conversely, conditional on becoming an active investor, 85 percent of AE participants become active contributors.

Table 7: Overlap Between Active Investors and Active Contributors

All AE Plans			
	Active Investors	Passive Investors	Total
Active Contributor	13,991 (14.6%)	40,536 (42.3%)	54,527
Passive Contributor	2,388 (2.5%)	38,868 (40.6%)	41,256
Total	16,379	79,404	95,783

4. Differences in individual characteristics between active and passive participants

In the previous section we defined active contributors and active investors and examined how their contribution and investment behavior compared with that of their passive peers. In this section, we examine how active participants compare with passive participants along the limited set of demographic information available in our data.

Table 8 compares active contributors – those who choose a different contribution rate than their plan's default – with passive contributors along available demographic characteristics. Relative to passive contributors, active contributors have considerably higher incomes ($74K vs. $55K), are somewhat older (39 years vs. 37 years), and are more likely to be males. The gender difference between the groups is small at only one percentage point but, due to our large sample size, it is statistically significant at the one percent level.

Table 8 Employee Demographic Characteristics, Active Contributors vs. Passive Contributors

All AE Plans		
	Active Contributors	**Passive Contributors**
Annual Income	\$74,233 (\$62,680)	\$54,876 (\$44,805)
Tenure in years	2.28 (2.18)	1.74 (1.47)
Age	39.3 (37.4)	37.4 (35.0)
Percentage Male	53.8%	52.9%
Percentage Female	34.3%	34.3%
Gender Unknown	11.9%	12.8%
N	54,527	41,256

NOTE: Data are presented as means, with corresponding medians in parentheses. Data are as of June 30, 2014 except for income, which is 2013 income. All differences across active and passive contributors are statistically significant at 1% level in two-sided t-tests except for percentage female (p-value =0.88).

Table 9 demonstrates that differences between active investors (who chose their own investment portfolio) and passive investors are even larger in magnitude than differences between active and passive contributors. Active investors have an average income of almost \$89,000, considerably larger than that of passive investors (\$61,000). Active investors also tend to be longer tenured and older than their passive colleagues, and men make up a larger portion of active investors than passive investors.

Table 9: Employee Demographic Characteristics, Active Investors vs. Passive Investors

All AE Plans		
	Active Investors	**Passive Investors**
Annual Income	\$88,509 (\$76,569)	\$61,231 (\$50,505)
Tenure in years	2.38 (2.33)	1.98 (1.82)
Age	41.0 (40.0)	37.9 (35.7)
Percentage Male	60.5%	52.0%
Percentage Female	27.6%	35.6%
Gender Unknown	11.9%	12.4%
N	16,379	79,404

NOTE: Data are presented as means, with corresponding medians in parentheses. Data are as of June 30, 2014 except for income, which is 2013 income. All differences across active and passive investors are statistically significant at 1% level in two-sided t-tests.

Table 10 compares "complete actives," the 15 percent of our sample who are both active contributors and active investors, with "complete passives," the 41 percent of our sample who are neither active contributors nor active investors (see Table 7). The observed differences are similar in nature to the comparison above, though even more pronounced: complete active types have considerably higher incomes and tenure than complete passive types. Complete active types are also older on average and are more likely to be male than are complete passive types.[10]

Table 10: Employee Demographic Characteristics, Complete Active Types vs. Complete Passive Types

All AE Plans		
	Complete Actives	Complete Passives
Annual Income	$91,562 ($79,482)	$53,908 ($43,725)
Tenure in years	2.41 (2.38)	1.72 (1.41)
Age	41.2 (40.3)	37.3 (34.8)
Percentage Male	60.9%	52.6%
Percentage Female	27.2%	34.6%
Gender Unknown	11.9%	12.9%
N	13,991	38,868

NOTE: Data are presented as means, with corresponding medians in parentheses. Data are as of June 30, 2014 except for income, which is 2013 income. All differences across complete active types and complete passive types are statistically significant at 1% level in two-sided t-tests.

5. Differences in plan characteristics between active and passive participants

Section 4 documents that active contributors and active investors tend to have higher incomes and job tenures and are more likely to be male than their passive counterparts. In this section we examine differences in plan characteristics between active and passive participants to get a better understanding of what plan-level characteristics correlate with moving away from plan default settings.

Plan characteristics may be important factors influencing whether participants elect to stick with their plan's default contribution rate and investment portfolio. Participants in plans that feature

[10] Table A4 in Appendix A compares complete actives, complete passives, active contributors and active investors along the available demographic characteristics.

default deferral rates less than the match cap may be more motivated, all else equal, to increase their contributions than participants in plans that feature defaults that exhaust employer matches. Similarly, participants in plans that feature immediate vesting of employer contributions may feel more ownership of their retirement funds and more likely to select their own investments than participants in plans where employer contributions vest gradually.

Table 11 compares active contributors with passive contributors along available plan characteristics. Active contributors are more likely to be in plans that feature automatic escalation, have lower initial default contribution rates, and default contribution rates less than the match cap. Interestingly, active contributors are also more likely to be in plans that offer immediate vesting of employer contributions. These findings suggest that participants may be more likely to select their own contribution rate when participating in a plan featuring automatic escalation, a low default contribution rate, a default contribution rate that doesn't fully exhaust the match cap, or immediate vesting. However, simple pairwise comparisons do not establish causality nor do they account for correlation with other factors that may be driving the perceived relationship.

Table 11: Plan Characteristics, Active Contributors vs. Passive Contributors

All AE Plans		
	Active Contributors	**Passive Contributors**
Has automatic escalation (default)	81.6%	76.5%
Has automatic escalation (voluntary)	11.6%	16.2%
Mean initial default contribution rate	3.45%	3.55%
Has an employer match	96.9%	97.1%
Initial default contribution rate less than match cap[11]	83.6%	78.1%
Plan offers immediate vesting of employer contributions[12]	47.6%	42.2%
Default fund is Target Date Fund	98.2%	98.4%
N	54,527	41,256

NOTE: All differences across active and passive contributors are statistically significant at the 1% level in two-sided t-tests except presence of employer match (p-value = .28) and use of a TDF as the default investment (p-value = .03).

While we find that automatic auto-escalation and lower default contribution rates are associated with being an active contributor, the reverse is true with respect to being an active investor. Table 12 shows that active investors are less likely to be in plans that have automatic

[11] Excludes 13 plans (and 6,343 employees) for which the match cap cannot be determined.

[12] Excludes 19 plans (and 2,782 employees) for which vesting schedule is unavailable.

auto-escalation, lower default contribution rates, and default contribution rates less than the match cap. Similar to the findings for active contributors, active investors are more likely to be participating in plans that offer immediate vesting of employer contributions. This suggests that participants may be less likely to choose their own investment portfolio when participating in a plan that features automatic escalation, a low default contribution rate, a default contribution rate less than the match cap, or vests employer contributions gradually rather than immediately. Similar to the findings above, these associations may be driven by other factors, which we investigate in our regression analysis presented below.

Table 12: Plan Characteristics,
Active Investors vs. Passive Investors

All AE Plans		
	Active Investors	Passive Investors
Has automatic escalation (default)	76.8%	80.0%
Has automatic escalation (voluntary)	13.7%	13.6%
Mean initial default contribution rate	3.57%	3.48%
Has an employer match	97.3%	96.9%
Initial default contribution rate less than match cap[13]	77.4%	82.0%
Plan offers immediate vesting of employer contributions[14]	50.2%	44.3%
Default fund is Target Date Fund	97.8%	98.4%
N	16,379	79,404

NOTE: All differences across active and passive investors are statistically significant at the 1% level in two-sided t-tests except presence of voluntary auto-increase (p-value = .57) and presence of employer match (p-value = .02).

Table 13 examines differences in plan characteristics for complete active types who are both active contributors and active investors, and complete passive types who stay with all relevant default settings of their plans. Complete active types are slightly more likely to be participating in a plan that features automatic auto-escalation, have slightly lower default contribution rates, and are slightly more likely to be in a plan that features a default contribution that fails to take full advantage of the match cap than complete passive types. Similar to active contributors and active investors, complete active types are more likely to be participating in plans that immediately vest employer contributions.

[13] Excludes 13 plans (and 6,343 employees) for which the match cap cannot be determined.

[14] Excludes 19 plans (and 2,782 employees) for which vesting schedule is unavailable.

Table 13: Plan Characteristics,
Complete Active Types vs. Complete Passive Types

All AE Plans		
	Complete Actives	Complete Passives
Has automatic escalation (default)	77.5%	76.8%
Has automatic escalation (voluntary)	13.4%	16.2%
Mean initial default contribution rate	3.50%	3.53%
Has an employer match	97.1%	97.0%
Initial default contribution rate less than match cap[15]	80.1%	79.1%
Plan offers immediate vesting of employer contributions[16]	49.6%	41.5%
Default fund is Target Date Fund	97.7%	98.2%
N	13,991	38,868

NOTE: All differences across complete actives and complete passives are statistically significant at the 1% level in two-sided t-tests except default automatic escalation (p-value = .08), presence of employer match (p-value = .41), and default contribution rate less than match cap (p-value = .01).

6. What predicts moving away from plan defaults?

The previous sections examined pair-wise differences between passive and active participants on demographic- and plan-level characteristics. While illustrative, such comparisons do not account for other factors which may be contributing to any perceived relationship (for example, age and income are highly correlated). In this section we use multivariate regression analysis to examine which factors, demographic and plan level, are predictive of participants choosing different contribution rates and investments than specified by their plan's defaults. In particular, we estimate probit models of the following form:

$$Y_i = \alpha + X_i'\delta + Z_i'\beta + \varepsilon_i \qquad (1)$$

where Y_i represents being an active contributor (or active investor) status taking a value of 1 if individual *i* ever chooses a contribution rate (investment portfolio) different than the one

[15] Excludes 13 plans (and 6,343 employees) for which the match cap cannot be determined.

[16] Excludes 19 plans (and 2,782 employees) for which vesting schedule is unavailable.

specified by his plans' default, X_i is a vector of demographic characteristics, Z_i is a vector of plan-level characteristics, and ε_i is a mean-zero error term.

Table 14 shows that, when controlling for the full battery of demographic and plan-level characteristics to which we have access, individuals with higher incomes are more likely to be active contributors. For every $10,000 increase in income, participants are 3.6 percentage points more likely to increase their contributions above the default level, and 0.7 percentage points less likely to ever reduce their contributions below the amount specified by the default path. Given our base predicted value of becoming an active increaser is 41 percent, this implies that individuals with $10,000 more in annual income are 9 percent more likely to be an active increaser relative to similar participants with lower incomes, a relatively large effect.

We find that women are actually more likely to be active contributors than men. Relative to the base predicted probability of becoming an active contributor (59 percent), the marginal effect is relatively small at 5 percent. However, when we break these results down into predicting actively increasing one's contribution rate above the default versus actively decreasing it below the default (second and third columns of this table), women are 2.8 percentage points more likely to reduce their contributions below the amount specified by their plan's default trajectory, which implies they are 13% more likely to decrease their contributions than are men.

Controlling for income (and other characteristics), we find no relationship between age and active contributor status. Table 14 also highlights the importance of controlling for the duration with which we observe participants, which is functionally equivalent to tenure given all participants in our sample are new hires, eligible to participate in their employer's plan, and retained at the end of our window of observation. Relative to participants who became eligible in 2010 (the omitted category), those who became eligible in later years are significantly less likely to be active contributors, principally because they have had less time to choose a different contribution rate.

In terms of plan characteristics, we find that participants defaulted into automatic escalation are 14 percentage points more likely than their counterparts to at some point contribute less than the amount scheduled by their plan, either by reducing their contribution rate or by forgoing planned increases. Given the base predicted probability of reducing contributions below the default (21 percent), this implies a large marginal effect of 71 percent. Individuals in plans that offer immediate vesting of employer contributions are 5.9 percentage points (14 percent) more likely to increase their contributions beyond the default than those whose employer contributions vest more gradually. We also find that participants in plans where the default deferral percentage is initially less than the match cap are significantly more likely to be active contributors. In particular, participants in these plans are 10.6 percentage points (26 percent) more likely to contribute more than the default than similarly situated participants whose default deferral percentage exhausts their employers' match (column 2). Somewhat surprisingly, we also find that participants with default deferral percentages less than the match cap are more likely to at some point *reduce* contributions below the default path (column 3). We also find that participants in plans for which we are missing match cap information are more likely to increase their contributions above the default than participants in plans where the default deferral percentage exhausts the match cap, perhaps because these plans' default contribution levels do not fully reach the (unobserved) match cap.

The level of the initial default contribution rate is an important predictor of whether an individual becomes an active contributor. Participants with default contribution rates above 3 percent (the modal value in our data) are 11 percentage points (26 percent) less likely to increase their contributions beyond the default path and 22 percentage points (109 percent) more likely to decrease their contributions to an amount below that specified by their plans' scheduled contribution trajectory relative to participants with default deferral percentages at 3 percent.

Table 14: Impacts of Demographic and Plan Level Characteristics on Selecting a Contribution Rate Different than the Default

	Active Contributor	Ever Increase	Ever Decrease
Individual characteristics			
Female (0/1)	0.027*	-0.007	0.028***
	(0.02)	(0.01)	(0.01)
Unknown gender (0/1)	0.015	-0.008	0.017**
	(0.01)	(0.01)	(0.01)
Age (in years)	0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)
Annual Income ($10,000s)	0.027***	0.036***	-0.007***
	(0.00)	(0.00)	(0.00)
Eligible in 2011 (0/1)	-0.081***	-0.017**	-0.083***
	(0.02)	(0.01)	(0.01)
Eligible in 2012 (0/1)	-0.155***	-0.032***	-0.159***
	(0.03)	(0.02)	(0.02)
Eligible in 2013 (0/1)	-0.329***	-0.133***	-0.293***
	(0.04)	(0.02)	(0.02)
Plan-level characteristics			
Automatic AI (0/1)	0.056	-0.054	0.142***
	(0.05)	(0.04)	(0.02)
Voluntary AI (0/1)	-0.051	-0.046	-0.010
	(0.05)	(0.04)	(0.02)
Immediate Vesting (0/1)	0.051	0.059**	0.005
	(0.03)	(0.03)	(0.03)
Immediate Vesting Unknown (0/1)	-0.101	-0.121	0.008
	(0.10)	(0.09)	(0.07)
Less than Match (0/1)	0.171***	0.106***	0.070***
	(0.03)	(0.03)	(0.02)
Less than Match unknown (0/1)	0.139*	0.169**	0.008
	(0.08)	(0.08)	(0.05)
Default < 3%	0.053	0.068	-0.003
	(0.07)	(0.05)	(0.06)
Default > 3%	0.084***	-0.108***	0.218***
	(0.02)	(0.03)	(0.03)
Constant term	Yes	Yes	Yes
N	95,783	95,783	95,783
Number plans (clusters)	205	205	205
Predicted probability (active)	0.591	0.410	0.213
R-squared			

Note: Coefficients are marginal effects from probit estimation calculated at the mean. All estimations cluster standard errors at the plan level. **p<0.10, **p<0.05, ***p<0.01.*

The first column of Table 15 examines which demographic and financial characteristics are predictive of choosing an investment portfolio different than that specified by one's plan's default. Similar to the summary statistics comparisons, we find that women are significantly (2.7 percentage points) less likely to select their own investments than men, which translates to a nearly 18% difference in rates of being an active investor across genders. Older individuals are also more likely to select a different investment portfolio than those who are younger, though the difference is practically small – each additional year of age only increases this probability by 0.1

percentage points. Similar to the relationship among active contributors, participants with higher incomes are more likely to be active investors, with each additional $10,000 in income increasing the probability of being an active investor by 1.5 percentage points (10 percent).

Table 15: Impacts of Demographic and Plan Level Characteristics on Selecting an Investment Portfolio Different than the Default

	Active Investor	Ever All Equity	Ever No Equity
Individual characteristics			
Female (0/1)	-0.027***	-0.006***	-0.001
	(0.01)	(0.00)	(0.00)
Unknown gender (0/1)	-0.002	-0.004***	0.001
	(0.01)	(0.00)	(0.01)
Age (in years)	0.001***	0.000***	0.000***
	(0.00)	(0.00)	(0.00)
Annual Income ($10,000s)	0.015***	0.0002***	0.0002***
	(0.00)	(0.00)	(0.00)
Eligible in 2011 (0/1)	-0.041***	-0.000	-0.001
	(0.01)	(0.00)	(0.01)
Eligible in 2012 (0/1)	-0.062***	-0.002	-0.002***
	(0.01)	(0.00)	(0.00)
Eligible in 2013 (0/1)	-0.105***	-0.001	-0.005***
	(0.02)	(0.00)	(0.00)
Plan-level characteristics			
Automatic AI (0/1)	-0.054**	-0.005	-0.002
	(0.03)	(0.00)	(0.00)
Voluntary AI (0/1)	-0.049*	-0.003	-0.000
	(0.03)	(0.00)	(0.00)
Immediate Vesting (0/1)	0.046**	0.004*	0.002***
	(0.02)	(0.00)	(0.00)
Immediate Vesting Unknown (0/1)	-0.013	0.007	-0.001
	(0.04)	(0.01)	(0.00)
Less than Match (0/1)	-0.020	-0.004	0.000
	(0.02)	(0.00)	(0.00)
Less than Match unknown (0/1)	-0.043*	-0.007**	0.001
	(0.03)	(0.00)	(0.00)
Default < 3%	0.011	0.003	-0.000
	(0.05)	(0.01)	(0.00)
Default > 3%	-0.006	0.001	0.001
	(0.02)	(0.00)	(0.00)
Constant term	Yes	Yes	Yes
N	95,783	95,783	95,783
Number plans (clusters)	205	205	205
Predicted probability (active)	0.154	0.016	0.004
R-squared			

Note: Coefficients are marginal effects from probit estimation calculated at the mean. All estimations cluster standard errors at the plan level. **p<0.10, **p<0.05, ***p<0.01.*

Like in the analysis of active contributors, we find that it is important to control for duration of observation in our data. Participants who became eligible to participate after 2010 are less likely to, at some point in our data, become active investors, likely because they have had less time to choose different investments than those who became eligible earlier. In terms of plan characteristics, we find that participants defaulted into automatic auto-escalation (and those who have voluntary auto-escalation) are 5 percentage points (35 percent) less likely to choose their own investments relative to those who belong to plans without auto-escalation. Similar to its impact on contribution behavior, participants in plans that immediately vest employer contributions are 5 percentage points (30 percent) more likely to select an investment profile that differs from the default than those with more gradual vesting. Unlike the impact on contribution behavior, we find no association between default deferral percentage and active investor status (though there is no clear ex ante relationship between the two).

It is also of interest to examine how demographic and plan characteristics influence portfolio risk as measured by equity percentage. Unfortunately, we do not observe the underlying assets participants hold, nor do we observe individual default equity percentages. Instead we examine what factors predict extreme portfolio allocations – holding either 0 percent or 100 percent equity at some point during our window of analysis (columns 2 & 3 in Table 15). Few participants in our data ever hold either of these types of portfolios, though our analysis suggests that men are more likely to hold allocations comprised entirely of equity than are women, and older participants and those with higher incomes are more likely than their respective counterparts to hold an extreme portfolio (either all or none in equities). Participants in plans with immediate vesting are also more likely to hold an extreme portfolio, though we find little impact of other plan characteristics.

7. Discussion and Conclusion

The introduction of automatic enrollment features into employer-sponsored defined contribution plans has greatly increased retirement plan participation by automatically enrolling employees into their employers' plans. However, despite not having to actively enroll, we find – perhaps surprisingly - that most AE participants will at some point take an "active" stance towards their retirement savings by choosing either a different contribution rate or investment portfolio than that specified by their plan's default settings. Among our sample of over 95,000 newly hired employees participating in their employer's AE plan, we find that fully 59 percent elect a different contribution rate, investment portfolio, or both within the first few years of participation. Selecting a different contribution rate is considerably more common than selecting different investments: 57 percent of AE participants choose a contribution rate different than the default, while only 17 percent of AE participants elect a different investment portfolio.

The majority of AE participants who choose their own contribution rate elect to increase it above their plan's default. Contribution rates for AE participants tend to increase with tenure, particularly for AE participants enrolled in a plan featuring automatic escalation. Participants who elect their own investment portfolio tend to hold less equity than participants who stick with the default investment, but a sizable minority of active investors (11 percent of the sample) hold a portfolio comprised entirely of equity at some point in our window of observation.

We find that women are more likely than men to choose a contribution rate different than the default, and do so by reducing their contribution levels on average. Specifically, women are 13 percent more likely to decrease their contribution levels than are men, but are no more or less likely to increase their contributions. We also find that AE participants with higher incomes are 9 percent more likely to select contribution rates above the default than their lower income peers. Plan-level characteristics are also important predictors of choosing a contribution rate different than the plan default. In particular, AE participants in plans that offer immediate vesting of employer contributions and plans that set the default deferral percentage below the match cap are more likely (14 and 26 percent, respectively) than their respective counterparts to select a contribution rate above the default. Conversely, AE participants in plans that feature default enrollment in automatic escalation and plans that have a default deferral percentage above 3 percent (the median default contribution rate in our data) are more likely to reduce their contributions relative to the default (71 and 109 percent, respectively) compared with their respective counterparts.

When it comes to choosing a different investment portfolio than the default, we find that men, those with higher incomes, and AE participants in plans that feature immediate vesting of employer contributions are more likely to choose their own investment portfolio than their respective counterparts. However, AE participants in plans that feature automatic escalation are less likely to move away from their plan's default investment portfolio than participants in plans without automatic increases.

We find that active investors have worse portfolio returns on average than their more passive counterparts. Though differences are quite small across active and passive investors, this negative effect is principally due to the fact that active investors tend to move towards a position of holding less equity, which had a negative overall effect on rates of return during the strong market performance observed during our period of observation (2010-2014). We are unfortunately not able to examine whether active investors improved the ex-ante efficiency of their portfolio, however, and our results do not imply that active investors made clear mistakes.

Our work contributes to the line of research documenting that employer choices regarding retirement plan design have important implications for employees' retirement savings behavior. In total, the patterns uncovered by our data suggest that retirement savings decisions are not "one size fits all," and there is a perhaps surprising level of demand on the part of AE participants for changes to one's default plan settings. The most popular action taken by AE participants to override a plan default is increasing one's contribution rate, which is perhaps good news insofar as that results in more retirement savings overall.

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Appendix A: Additional Tables

Table A1: Rates of contributing more than the default contribution rate in a given year of participation, by participation cohort

	Initial Participation Date 2010				Initial Participation Date 2011			Initial Participation Date in 2012		Initial Participation Date in 2013
	Year 1	Year 2	Year 3	Year 4	Year 1	Year 2	Year 3	Year 1	Year 2	Year 1
No auto-escalation	40.7%	47.1%	51.8%	54.2%	47.6%	53.4%	57.3%	39.0%	46.4%	38.2%
Automatic auto-escalation	35.6%	44.2%	45.7%	43.1%	32.4%	42.6%	44.8%	34.0%	44.6%	32.7%
Voluntary auto-escalation	27.1%	34.1%	39.2%	43.4%	31.2%	38.7%	43.8%	30.4%	38.5%	33.5%
Overall	34.7%	43.0%	45.2%	43.9%	33.5%	42.9%	45.8%	33.9%	43.9%	33.2%
N	10,111				18,254			24,409		39,494

Table A2: Rates of contributing less than the default contribution rate in a given year of participation, by participation cohort

	Initial Participation Date 2010				Initial Participation Date 2011			Initial Participation Date in 2012		Initial Participation Date in 2013
	Year 1	Year 2	Year 3	Year 4	Year 1	Year 2	Year 3	Year 1	Year 2	Year 1
No auto-escalation	6.9%	7.9%	7.4%	7.9%	8.6%	8.8%	10.3%	7.5%	8.1%	8.2%
Automatic auto-escalation	8.8%	23.3%	32.8%	42.3%	8.9%	20.4%	29.1%	8.6%	20.0%	13.1%
Voluntary auto-escalation	10.9%	10.8%	11.0%	12.4%	7.5%	8.5%	10.0%	9.0%	9.4%	10.1%
Overall	9.0%	20.7%	28.4%	36.2%	8.7%	17.6%	24.6%	8.6%	17.6%	12.5%
N	10,111				18,254			24,409		39,494

Table A3: Rates of always contributing at the default contribution rate in a given year of participation, by participation cohort

	Initial Participation Date 2010				Initial Participation Date 2011			Initial Participation Date in 2012		Initial Participation Date in 2013
	Year 1	Year 2	Year 3	Year 4	Year 1	Year 2	Year 3	Year 1	Year 2	Year 1
No auto-escalation	53.4%	46.6%	42.5%	39.9%	43.4%	39.9%	35.4%	55.2%	48.3%	55.3%
Automatic auto-escalation	57.6%	36.6%	27.4%	22.2%	60.4%	41.4%	32.3%	59.0%	40.1%	56.4%
Voluntary auto-escalation	64.1%	57.2%	51.9%	47.4%	62.2%	54.6%	49.0%	61.8%	53.9%	58.0%
Overall	58.2%	40.0%	31.6%	26.6%	59.4%	43.2%	35.1%	59.1%	42.6%	56.6%
N	10,111				18,254			24,409		39,494

Table A4: Employee Demographic Characteristics: Complete Actives, Active Contributors, Active Investors, and Complete Passives

All AE Plans				
	Complete Actives	**Active Contributors (but not active investors)**	**Active Investors (but not active contributors)**	**Complete Passives**
Annual Income	\$91,562 (\$79,482)	\$68,252 (\$57,439)	\$70,619 (\$61,064)	\$53,908 (\$43,725)
Tenure in years	2.41 (2.38)	2.24 (2.13)	2.21 (2.08)	1.72 (1.41)
Age	41.2 (40.3)	38.6 (36.5)	39.7 (38.7)	37.3 (34.8)
Percentage Male	60.9%	51.3%	58.2%	52.6%
Percentage Female	27.2%	36.7%	29.9%	34.6%
Gender Unknown	11.9%	12.0%	11.9%	12.9%
N	13,991	40,536	2,388	38,868