The Relationship Between Automatic Enrollment and DC Plan Contributions: Evidence from a National Survey of Older Workers

Barbara A. Butrica   and   Nadia S. Karamcheva

Urban Institute   *Congressional Budget Office*

Abstract

Automatic enrollment has been widely embraced for raising employee participation in 401(k) plans. However, the empirical evidence is based on data with limitations that, up until now, have prevented researchers from extrapolating the effects of automatic enrollment to the broader population of workers. This paper reexamines the determinants of 401(k) participation and contributions in the presence of automatic enrollment using nationally representative data from the Health and Retirement Study (HRS) for 2006 through 2012. The results confirm previous findings that automatic enrollment is associated with a higher proportion of workers included in DC plans; however, automatically enrolled workers are less likely to contribute to their DC plans than voluntarily enrolled workers. Auto enrollment is also associated with lower employee contribution amounts and rates. However, the employers of auto-enrolled workers are more likely to contribute to their employees' accounts than are the employers of voluntarily enrolled workers. Additionally, employer contribution amounts and rates are higher among workers who are automatically enrolled. Even so, the combined effect is that the retirement accounts of automatically enrolled older workers receive, on average, $900 less in combined annual contributions and have contribution rates that are 1.6 percentage points lower than those of voluntarily enrolled workers.

JEL Classification: D3, D14, J26, J32

Introduction

As defined contribution (DC) plans have grown in popularity, so has concern about the retirement security they will provide. Using various data sources, including household surveys, employer-provided plan data, and administrative records of earnings and contributions, previous studies have established that participation, contributions, and accumulations in tax-deferred retirement accounts are concentrated predominantly among higher-income individuals (Bassett, Fleming and Rodrigues 1998; Dworak-Fisher 2011; Dushi, Iams and Tamborini 2011; Karamcheva and Sanzenbacher 2010). These findings have sounded alarms about growing retirement income inequality and stimulated debate about the best ways of boosting DC plan participation and contributions.

Previous research has demonstrated that automatic enrollment is associated with significant increases in 401(k) plan participation, and is particularly effective for workers who otherwise would not participate (Beshears et al. 2010; Choi et al. 2002, 2004; Madrian and Shea 2001). However, the empirical evidence is based on data with limitations that have prevented researchers from extrapolating the effects of automatic enrollment to the broader population of workers.

This paper reexamines the determinants of DC plan participation and contributions in the presence of automatic enrollment using data that is nationally representative of older workers and also includes detailed information about their characteristics and economic circumstances. Consistent with other studies, the results show that automatic enrollment is associated with a higher proportion of older workers included in DC plans—particularly short-tenure workers and the lowest earners. Something not highlighted in other studies, however, is the relationship between automatic enrollment and total DC contributions. Controlling for a number of different factors, we find that automatic enrollment is associated with a lower likelihood that older workers will contribute to their DC plans. As a result, employee contribution amounts and contribution rates are *lower* among those who report having been automatically enrolled compared with those who were given a choice to enroll. However, we also find that automatic enrollment is associated with an increased probability that older workers' employers will contribute to their plans. As a result, employer contribution amounts and contribution rates are *higher* among autoenrolled workers than voluntarily enrolled workers. Because the higher employer contributions are not high enough to offset the lower employee contributions, the

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combined effect is that the retirement accounts of automatically enrolled older workers receive, on average, $900 less in annual total contributions and 1.6 percentage points lower total contribution rates than those of voluntarily enrolled workers.

Background

The pension landscape in the United States has been gradually shifting as employers move away from offering their employees defined benefit (DB) pension plans towards offering them DC plans. Between 1989 and 2014, the proportion of private industry full-time workers participating in DB pension plans declined from 42 to 19 percent, while the share participating in DC plans increased from 40 to 52 percent (Wiatrowski 2011; U.S. Bureau of Labor Statistics 2014). The rise in DC plans has introduced problems not typically experienced with DB pensions, such as voluntary participation. In DB pensions, employees are usually automatically enrolled and typically cannot opt out. Although slowly changing, in most DC plans employees must elect to participate. As a result, participation rates among private wage and salary workers in 2014 who were offered an employer retirement plan were 86 percent in DB pensions but only 70 percent in DC plans (U.S. Bureau of Labor Statistics 2014). Even among full-time workers— whose participation rates are typically higher—participation rates were 88 percent in DB pensions but only 74 percent in DC plans (U.S. Bureau of Labor Statistics 2014).

Those employees who are offered plans yet choose not to participate are most concerning to policymakers.[1] Not only are these workers not taking advantage of tax-deferred opportunities to save for retirement, but many are giving away money by not taking advantage of their employer's matching contributions. Recognizing the capacity for automatic enrollment to increase participation in DC plans and thereby increase retirement savings, the U.S. Treasury Department authorized employer's adoption of autoenrollment in 1998 for new hires and again in 2000 for previously hired employees not already participating in their employer's plan (Choi et al. 2004).

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[1] Karamcheva and Sanzenbacher (2010) use the Survey of Income and Program Participation to explore some of the reasons why workers do not participate in their employers' defined contribution plans. While opt-out mechanisms are unlikely to increase participation among workers whose reasons for not participating are related to eligibility or monetary constraints, such as "cannot afford to contribute" or "do not want to tie up money," automatic enrollment might be effective when non-participation is due to inertia—for example, "not thinking about it."

Automatic enrollment (also known as "negative election") is a 401(k) plan feature in which elective employee deferrals begin without requiring the employee to submit a request to join the plan. When automatic enrollment is present, employees have a pre-determined percentage of their pay deferred as soon as they become eligible for the plan. If employees do not want to participate, they must actively request to be excluded from the plan.

Several studies and anecdotal accounts suggest that automatic enrollment has succeeded in dramatically increasing 401(k) participation (Beshears et al. 2010; Choi et al. 2002, 2004; Madrian and Shea 2001). Madrian and Shea (2001), for example, document a 48 percentage point increase in 401(k) participation among newly hired employees and an 11 percentage point increase in participation overall at one large U.S. company 15 months after the adoption of automatic enrollment. The authors also note that automatic enrollment has been particularly successful at increasing 401(k) participation among employees least likely to participate in retirement savings plans, namely those who are young, lower-paid, black, or Hispanic. Beshears et al. (2010) find that automatic enrollment raises participation even in the absence of more traditional plan features known to be effective, such as the employer match.

Although participation has been demonstrated to increase with automatic enrollment, studies have also shown that automatically enrolled employees tend to remain with the default options of their plan. Madrian and Shea (2001) show that, at least in the short term, only a small fraction of automatically enrolled 401(k) participants elect a contribution rate or asset allocation that differs from the company-specified default. Moreover, most employers set the default employee contribution rate in their 401(k) plans at a rate which does not take full advantage of the employer match (Butrica and Karamcheva 2012). A Vanguard study finds that automatic enrollment leads to lower plan contribution rates, as participants who would have voluntarily saved at a higher rate remain at the lower default contribution rates (Nessmith, Utkus, and Young 2007).

Empirical findings on the effects of automatic enrollment on participation and contributions, so far, originate from three main sources, each having its disadvantages. Individual firm case studies, one such data source, observe participants' behavior before and after automatic enrollment, but typically do not generalize to the larger population of workers (e.g. Madrian and Shea 2001; Beshears et al. 2010). Proprietary plan-level data from plan sponsors usually covers a substantial number of predominantly larger plans, but are not necessarily representative of all

covered workers (e.g. Nessmith, Utkus and Young 2007; VanDerhei 2010; Vanguard 2012). Finally, firm-level data such as the Form 5500 series or the National Compensation Survey (NCS), while nationally representative, lack important demographic and socioeconomic information necessary to analyze individual participants' behavior (e.g. Soto and Butrica 2009; Butrica and Karamcheva 2012).

This paper reexamines the determinants of DC plan participation and contributions in the presence of automatic enrollment using data that is nationally representative of older workers and also includes detailed information on their characteristics and economic circumstances.

Data

Our data come from the Health and Retirement Study (HRS), a large nationally representative survey of Americans age 51 and older that has been tracking households since 1992. The HRS provides valuable information on personal characteristics, employment, earnings, income, financial assets, and pensions. In 2006, the HRS began asking household respondents about automatic enrollment, making it the first nationally representative household survey to collect this information. Unfortunately, the skip pattern in the questions involving autoenrollment changed twice since they were first asked. In 2006, only respondents included in a DC plan were asked about autoenrollment. In 2008 and 2010, these respondents plus respondents who were not included but eligible were asked whether the plan is one where workers are automatically enrolled. Then in 2012, once again, only respondents included in a DC plan were asked about autoenrollment. So while most of our analyses use pooled data from the 2006, 2008, 2010, and 2012 waves to analyze automatic enrollment for those included in retirement plans, our analyses of respondents offered DC plans are based only on pooled data from the 2008 and 2010 waves.

We define workers as individuals who are working at the interview date and report positive earnings. Workers are *offered* a DC plan if they report being included in their employer's DC plan or, if not included, they report that their employer offers a DC plan for which they are eligible but choose not to participate. Workers are *included* in a plan if they report being included in their employer's DC plan and also report that they or their employers contributed (positive amounts) to their accounts. This measure is similar to what is sometimes called participation. For example, in the NCS the Bureau of Labor Statistics classifies

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participants as all those in noncontributory plans plus those in contributory plans who have made the required contributions.[2]

Information on automatic enrollment comes from a couple of questions in the HRS survey. First, workers who are included in a pension plan are asked whether they were given a choice to participate or were enrolled automatically when they became eligible to participate in the company's retirement/pension plan. Second, in 2008 and 2010 the survey added a similar question for workers who are not included in a plan, but whose employer offers a plan for which they are eligible. These workers are asked whether their firm requires employees to sign up for this plan or whether they are automatically enrolled.

We look at the main plan when analyzing contribution amounts and rates. Contribution amounts are the contribution rate multiplied by earnings, unless respondents report their contribution amount. Contribution rates are contributions divided by earnings, unless respondents report their contribution rate. We express all dollar amounts in constant 2012 dollars (indexed to changes in the Consumer Price Index).

Our analyses focus on private sector workers. For the descriptive analyses, we restrict the sample to workers ages 55 to 69 in each of the pooled waves to ensure the results are nationally representative and to minimize age bias across waves. For the multivariate analyses, we examine those who are less than age 70 in each of the pooled waves.

Methodology

We begin our analyses by showing how rates of being included in a DC plan and making positive contributions, as well as how contribution levels and contribution rates differ between automatically enrolled and voluntarily enrolled workers. We also examine the extent to which we observe the same differences by job tenure and earnings level. We define short-tenure workers as those with 4 years or less of tenure on the main job.

Then in our empirical specifications, we use linear probability models to analyze the likelihood of being including in a DC plan if offered a DC plan and the determinants of making

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[2] Turner, Muller, and Verma (2003) note that there are many different definitions of pension participation. The three definitions commonly used are based on: positive account balances (regardless of whether the employee or employer made contributions), the worker answering "yes" to the question "Are you a participant," and the worker contributing to a plan.

positive contributions to a DC plan if included in one.[3] Next we use ordinary least squares (OLS) regression models to analyze the determinants of contribution rates and contribution levels for those included in a DC plan.[4]

We separately analyze employee, employer, and total contributions as functions of personal demographic and socio-economic characteristics and the automatic enrollment provision—our main variable of interest. Other predictors in the models include age, sex, education, race, marital status, log of nonlabor income, log of wealth, whether the spouse makes contributions to his or her DC plan, and year dummies to capture changes in worker behavior over time. We also include an indicator of whether the worker is a short-tenure worker on the current job and indicators of earnings quintiles.

Results

First, we describe how rates of being included and making positive contributions to DC plans differ between automatically and voluntarily enrolled workers. Then we show how contribution levels and rates differ by automatic enrollment. We focus on the degree to which any overall differences we observe are similar by job tenure and earnings level. Finally, we discuss our results from multivariate analyses that control for various demographic and economic characteristics and highlight the extent to which these results support our descriptive findings.

Does Being Included and Contributing to DC Plans Differ by Automatic Enrollment?

Among older workers offered a DC plan, we find that those with autoenrollment are more likely to be included in a retirement plan than those without autoenrollment. For example, 92.7 percent of older workers who were automatically enrolled are included in a DC plan, compared with only 84.9 percent of those who were given the option to enroll (table 1). Differences by autoenrollment in the share of workers who report being included in a DC plan are largest for short-tenure workers and the lowest earners. For example, among short-tenure workers offered a DC plan, 80.8 percent of those autoenrolled report being included in the plan, compared with

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[3] We prefer linear probability models to probit or logit models because the linear framework makes the interpretation of the marginal effects on the interaction terms easier (interaction terms include automatic enrollment interacted with short-tenure worker status or with earnings quintiles). The results from corresponding probit models are similar and are available upon request.

[4] In all specifications, we report panel-robust standard errors clustered on individual level.

only 68.2 percent of those who voluntarily enroll. Also, among the lowest earners offered a DC plan, 91 percent of those autoenrolled report being included in the plan, compared with only 51.6 percent of those who opt-in. So, similar to other studies we find evidence suggesting that automatic enrollment increases the percentage of workers included in DC plans—particularly those workers least likely to voluntarily opt-in.

Different from other studies, however, we also find that among those included in a plan, workers who were automatically enrolled when they became eligible are less likely to contribute to their DC plan than those who voluntarily enrolled (table 2). This finding could reflect differences in the composition of workers if autoenrolled workers are less inclined to save than voluntarily enrolled workers. It could also reflect differences in the composition of plans if autoenrolled workers are more likely than opt-in workers to be in noncontributory plans.[5] Finally, it could reflect confusion among autoenrolled workers who are unsure whether contributions come from them or their employers because they were defaulted into contributing to their plans. The HRS does not allow us to separately identify these potential causes; however, it does provide some evidence that the higher presence of noncontributory plans among workers with automatic enrollment plan features might be a significant driver.[6]

According to the HRS, among older workers included in a DC plan, only 65.3 percent of those with autoenrollment report contributing to the plan compared with 95.5 percent of those without autoenrollment. Although differences by autoenrollment in the share of workers included in DC plans are considerably higher for short-tenure workers and lower earners (see table 1), this

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[5] For our analysis, noncontributory plans are those plans which *permit* but *do not require* employees to contribute. This definition would include money-purchase or profit-sharing plans that typically do not require employee contributions, as well as 401(k) plans with noncontingent employer contributions.

[6] Starting with the 2008 wave, respondents were asked to report the name of the plan that they are included in ("how the employer calls it"). We grouped the plans in four categories: 401(k), 401(k)-like (supplemental retirement A, 401a, 403b, 457, thrift and savings, SEP or simple plan), profit-sharing or similar (employee stock ownership, money purchase plan, employee stock purchase, stock ownership and purchase), and general DC. Based on pooled data from the 2008, 2010, and 2012 waves, automatic enrollment is significantly more prevalent among profit-sharing plans (48 percent) compared with 401(k) (19 percent) or 401(k)-like (21 percent) plans. Additionally, for autoenrolled workers, the chances of receiving employer contributions do not appear to depend on employees contributing themselves. The share of those receiving employer contributions is about 85 percent for both employees who contribute and those who do not. For voluntarily enrolled workers, in contrast, the chances of receiving employer contributions do appear to depend on whether employees contribute. The share of those receiving employer contributions is 81 percent for employees who contribute, but only 57 percent for employees who do not contribute.

is not the case for the share of workers contributing to DC plans among those included in these plans.

Differences by automatic enrollment are similar for long-tenure and short-tenure workers and reflect the overall differences; however, they are less similar across the earnings distribution. Among the lowest earners, only 59.2 percent of opt-out workers make contributions compared with 90.8 percent of opt-in workers. This gap, roughly 32 percentage points, is similar for workers through the fourth earnings quintile, but shrinks slightly for those in the top quintile. Among the highest earners, 70.8 percent of opt-out workers contribute to their plans compared with 97 percent of opt-in workers—a 26 percentage point difference.

In contrast, we find that autoenrolled workers are more likely to receive employer contributions to their DC plans than voluntarily enrolled workers (table 2). Overall, 90.6 percent of workers with automatic enrollment report employer contributions compared with only 86.8 percent of workers without autoenrollment. The largest differences are for long-tenure workers (5 percentage points) and the lowest and highest earners (7 and 8 percentage points, respectively).

Contribution Levels among Workers in DC Plans

Among older workers included in a DC plan, the median employee contribution amount is significantly lower for those who are automatically enrolled than for those who are not—regardless of job tenure and earnings level (table 3). At least some of this difference is driven by the lower incidence of positive contributions among those automatically enrolled (see table 2).

The typical worker contributes only $1,293 per year if autoenrolled and $3,354 per year if not—with the largest level differences being for long-tenure workers and the highest earners, but the largest percentage differences being for short-tenure workers and for lower earners. For example, autoenrolled short-tenure workers contribute $1,934 (72 percent) less than those who voluntarily enroll. In contrast, autoenrolled long-tenure workers contribute $2,119 (60 percent) less than those who voluntarily enroll. Additionally, the lowest earners with automatic enrollment contribute $406 (70 percent) less than those without it. The highest earners with automatic enrollment, in contrast, contribute $2,984 (34 percent) less than those without it.

Looking at the distribution of contribution amounts tells a similar story. Figure 1 includes histograms of employee contribution amounts for workers who reported being automatically

enrolled and those who said they were given a choice whether to enroll. They show that 52 percent of autoenrolled workers contribute $1,000 or less (including nothing) to their retirement plans, compared with only about 21 percent of voluntarily enrolled workers.

Although autoenrolled workers contribute less to their retirement accounts, their employers contribute more. The typical worker gets $2,248 per year in employer contributions if autoenrolled and only $1,608 per year if not—with the largest level *and* percentage differences being for long-tenure workers and the highest earners. Figure 2 includes histograms of employer contribution amounts for workers without and with automatic enrollment. They show that 38 percent of autoenrolled workers receive employer contributions of $1,000 or less and 53 percent receive contributions of $2,000 or less. In comparison, about 41 percent of voluntarily enrolled workers receive employer contributions of $1,000 or less and 61 percent receive contributions of $2,000 or less.

To the extent that workers misunderstand where contributions to their plans come from, looking at total contributions might be more appropriate and less prone to measurement bias. When we do this, we find that the higher employer contributions are not high enough to offset the lower employee contributions. The combined effect is that total DC contributions are lower for automatically enrolled workers than for voluntarily enrolled workers—with the level and percentage differences being largest for short-tenure workers. The typical worker has total DC contributions of $4,800 per year if autoenrolled and $6,072 per year if not. Total contributions for autoenrolled short-tenure workers are $2,291 (46 percent) less than those for opt-in short-tenure workers. In contrast, total contributions for autoenrolled long-tenure workers are only $784 (12 percent) less than those for opt-in long-tenure workers. Total contributions by automatic enrollment do not differ (or only slightly differ) in a statistically significant way across the earnings distribution.

Figure 3 includes histograms of total contribution amounts for workers without and with automatic enrollment. They show that about 18 percent of autoenrolled workers have $1,000 or less contributed to their DC plans compared with only about 10 percent of opt-in workers.

Contribution Rates among Workers in DC Plans

Analyzing contribution amounts can be a bit confusing since they are a function of both earnings and the contribution rate. Next, we examine contribution rates, or the percentage of earnings contributed to the plan, by automatic enrollment. Among older workers included in DC

plans, median employee contribution rates are significantly lower for workers who are automatically enrolled than for those who are not, regardless of job tenure or earnings (table 4). As mentioned previously, at least some of this difference is driven by the lower incidence of positive contributions among those automatically enrolled (see table 2).[7]

The typical worker contributes only 3 percent if autoenrolled and 6 percent if not—with the largest level *and* percentage differences being for short-tenure workers and the lowest earners. The distribution of contribution rates tells the same story. Figure 4 includes histograms of employee contribution rates for workers with and without autoenrollment. They show that about 45 percent of autoenrolled workers contribute 2 percent or less (including nothing) to their retirement plans compared with only 13 percent of workers without autoenrollment.

As with employer contribution amounts, employer contribution rates are higher for workers who are autoenrolled than for those who voluntarily enrolled. Overall for the typical worker, employers contribute 4.4 percent if automatically enrolled and only 3 percent if not. The largest and only statistically significant differences are for long-tenure workers and the highest earners. Employers of these workers contribute 5 percent if automatically enrolled and only 3 percent if not. Figure 5 includes histograms of employer contribution rates for workers with and without autoenrollment. They show that employer contribution rates are higher than 4 percent for about 47 percent of autoenrolled workers, but only 41 percent of voluntarily enrolled workers. Furthermore, employer contribution rates are higher than 8 percent for about 23 percent of workers who are autoenrolled, but only 13 percent of those who were given a choice to enroll.

Taking account of both employee and employer contributions, median total contribution rates are virtually identical for workers who are autoenrolled and those who are not (10 versus 11 percent). In fact, we find no statistically significant differences in median total contribution rates for workers with and without autoenrollment. While this is true for the median values, it does not imply that the distribution of total contribution rates is identical for those with and without automatic enrollment. In fact, figure 6 shows that the distribution of total contribution rates is skewed more toward lower contribution rates for automatically enrolled workers and skewed more toward higher contribution rates for voluntarily enrolled workers. There is a higher density of workers whose contribution rates are 4 percent or less among those with automatic enrollment

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[7] We find that the difference persists, even if diminished, when we restrict the analysis to only those with positive contributions. The results are not reported, but are available upon request.

than those without. This result is not necessarily surprising since other studies have found that automatically enrolled workers tend to be defaulted into lower than average contribution rates and to remain there (Madrian and Shea, 2011; Nessmith, Utkus, and Young 2007). Based on our analysis of older workers in the HRS, however, this result appears to be driven by the propensity for automatically enrolled workers to not contribute to their DC plans.

Multivariate Analyses of the Likelihood of Being Included and Contributing to DC Plans

The descriptive analyses revealed important differences by automatic enrollment with respect to the share of workers included and the share of workers contributing to their employer's DC plan. In this section, we examine whether these relationships still exist after controlling for other factors.

Table 5 presents estimated marginal effects of the independent variables on the probability of being included in an offered DC plan. As previously mentioned, this analysis is limited to only the 2008 and 2010 HRS waves because these are the only survey years between 2006 and 2012 in which we can infer DC offers for those respondents who report not being included in a DC plan.

The estimates show that the probability of being included if offered a DC plan is higher for workers who are between ages 50 and 59 (compared with those under age 50), have higher wealth, have a spouse who contributes to a DC plan, or have higher earnings than for their counterparts. In contrast, short-tenure workers are less likely than long-tenure workers to be included in a DC plan. For example, short-tenure workers are on average 17.4 percentage points less likely to be included in a DC plan than long-tenure workers (column 1). This may reflect waiting periods for new workers or failure to initially enroll in offered plans with new employers. This finding is consistent with other studies (Butrica and Smith, forthcoming; Smith, Johnson, and Muller 2004). Additionally, workers in the bottom quintile of the earnings distribution are 16.3 percentage points and those in the second quintile are 9.6 percentage points less likely to be included compared with those in the middle of the distribution (column 1). Workers in the top quintile, however, are 10.6 percentage points more likely to be included in a DC plan than those in the middle quintile. Automatic enrollment, our key variable of interest, is associated with a 10.6 percentage point higher probability of being included in a DC plan and is statistically significant with a 99 percent confidence level.

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Columns 2 and 3 test for differences in automatic enrollment by job tenure and earnings. As in the descriptive analyses, we find that automatic enrollment has the biggest effect on short-tenure workers and the lowest earners. Automatic enrollment is associated with only a 7.9 percentage point higher likelihood of being included in a DC plan for long-tenure workers, but a 20.3 percentage point higher likelihood of being included for short-tenure workers (column 2).[8] Additionally, automatic enrollment's positive effect on being included in a DC plan declines with earnings. For example, autoenrollment is correlated with a 29.3 percentage point increase in the likelihood of being included in a plan for the lowest earners, a 14.1 percentage point increase in the likelihood for middle earners, and only a 4.1 percentage point increase in the likelihood for the highest earners (column 3).

Table 6 presents estimated marginal effects of the independent variables on the probability of contributing to a DC plan among those included. In this analysis, we estimate separate regressions for employee and employer contributions. The likelihood that a worker contributes to a DC plan is positively correlated with being a higher earner. Workers in the bottom quintile of the earnings distribution are 6.1 percentage points less likely to contribute to their DC plans than those in the middle of the distribution (column 1). Workers in the top quintile, however, are 4.4 percentage points more likely to contribute to their DC plans than those in the middle quintile. Finally, we find that workers who are automatically enrolled are 32.3 percentage points less likely to contribute to their plans than those who opt-in. The result is similar in magnitude to the one in the descriptive analysis (see table 2), and, as mentioned before, is likely driven by a number of possible factors. Autoenrolled workers might be less inclined than opt-in workers to save. Alternatively, autoenrolled workers might be less likely than opt-in workers to be in plans that require them to contribute. Finally, autoenrolled workers might be confused about whether contributions come from them or their employers because they were defaulted into contributing to their plans. Unfortunately, we are not able to disentangle these causes with the available data.

Table 6 also shows evidence of heterogeneous effects of automatic enrollment by job tenure and earnings. In particular, autoenrollment seems to have less of a negative on the

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[8] This finding is based on a T-test on the sum of the coefficient on automatic enrollment and the coefficient on the interaction term between automatic enrollment and short-tenure worker status. We test whether that linear combination is significantly different from zero. We use the same procedure to test for the effect of automatic enrollment on individuals in different earnings quintiles.

likelihood of contributing to a DC plan for short-tenure workers and the highest earners. While long-tenure workers are 33.9 percentage points less likely to contribute to a DC plan if autoenrolled than if voluntarily enrolled, short-tenure workers are only 25.5 percentage points less likely to contribute if automatically enrolled (column 2). Among the lowest earners, those who are autoenrolled are 32.2 percentage points less likely to contribute to their plans than those who opt in (column 3). Among the highest earners, those who are autoenrolled are 30.6 percentage points less likely to contribute to their plans than those who voluntarily enroll.

Although autoenrolled workers are less likely to contribute to their DC plans, they are more likely than opt-in workers to be in plans that their employers contribute to. For example, autoenrolled workers are 2.9 percentage points more likely than opt-in workers to have employers contribute to their DC plans (column 4). Similar to the descriptive results and even controlling for other factors, automatic enrollment has a larger effect on long-tenure workers and the highest earners. If automatically enrolled, the possibility of receiving employer contributions increases 3 percentage points for long-tenure workers (column 5) and 5.4 percentage points for the highest earners (column 6). However, automatic enrollment has no statistically significant effect on short-tenure workers or the lowest earners.

Multivariate Analyses of Contribution Amounts and Contribution Rates

The descriptive analyses revealed important differences in DC contributions by automatic enrollment. In this section, we examine whether these relationships still exist after controlling for other factors.

Table 7 shows results from OLS models of contribution amounts among workers included in a DC plan. As expected, employee contribution amounts are positively associated with having a college degree, higher other income, and higher wealth. Additionally, both employee and employer contributions increase with workers' earnings.

With respect to automatic enrollment, we find that autoenrolled workers contribute $1,684 less per year to their DC plans than opt-in workers (column 1). Linear combination tests suggest that automatic enrollment affects employee contribution amounts differently by job tenure and earnings level—with the largest differences being for long-tenure workers and the highest earners. For example, long-tenure workers contribute about $1,845 less and short-tenure workers contribute $1,021 less if they are autoenrolled than if they opt-in (column 2). Additionally, automatic enrollment's negative correlation with employee contributions increases

with earnings. For example, the lowest earners contribute $462 less, middle earners contribute $913 less, and the highest earners contribute $3,161 less if they are automatically enrolled than if they voluntarily enroll (column 3).

Although automatic enrollment is correlated with lower employee contributions, it is also associated with higher employer contributions, particularly among high earners (columns 4-6). On the surface, this finding appears to contradict the finding reported in Butrica and Karamcheva (2012), which found that employer match rates were lower among plans with autoenrollment than those without. However, their finding was based on plans, considered only contributory plans (i.e. plans with employer matches), and analyzed plan match generosity among plans with flat match structures rather than actual employer contribution rates, which are a function of both the plan match generosity and employee behavior. In contrast, the current finding is based on workers, potentially considers both noncontributory and contributory plans, and analyzes actual contributions rather than match generosity. We find that annual employer contributions are $2,158 higher for the top earners who autoenroll than for those who do not. However, we find no statistically significant differences by automatic enrollment for those who are not the top earners.

The combined effect of lower employee contributions and higher employer contributions is that older workers who report being automatically enrolled deposit around $900 less (employee plus employer contributions) per year into their DC accounts than those who voluntarily enroll (column 7). However, there are no statistically significant differences in this correlation by job tenure or earnings level (columns 8-9).

Finally, table 8 presents findings from OLS regressions of contribution rates. Higher education, other income, wealth, and earnings are all associated with higher employee contribution rates. Automatic enrollment, in contrast, is associated with lower employee contribution rates—a finding that also confirms the descriptive results. Employee contribution rates are 2.6 percentage points lower for automatically enrolled workers than for opt-in workers (column 1). Linear combination tests suggest that the negative correlation between automatic enrollment and employee contribution rates is slightly larger for long-tenure workers than short-tenure workers (-2.7 percentage points versus -2 percentage points in column 2), but roughly constant across earnings quintiles (-2.7 for the lowest earners, -2.4 for those in the middle, and -2.8 for the highest earners in column 3).

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Automatic enrollment is also associated with higher employer contribution rates. Overall, employer contribution rates are 1.1 percentage points higher for autoenrolled workers than for voluntarily enrolled workers (column 4). The largest differences are for long-tenure workers and the highest earners. Among long-tenure workers, for example, those who are autoenrolled have employer contribution rates that are 1.2 percentage points higher than those who are voluntarily enrolled (column 5). In contrast, autoenrollment has no statistically significant difference on the employer contribution rates of short-tenure workers. Additionally, automatic enrollment is associated with employer contribution rates that are 2.1 percentage points higher for the highest earners, but only 1.1 percentage points higher for workers in the second earnings quintile, and insignificant for the lowest and middle earners (column 6).

The combined effect is that total contribution rates are 1.6 percentage points lower for autoenrolled workers compared with voluntarily enrolled workers (column 7). Among long-tenure workers, automatic enrollment is associated with total contribution rates that are 1.8 percentage points lower; however, there is no statistically significant difference for short-tenure workers (column 8). Automatic enrollment is associated with lower total contribution rates for workers in the middle of the earnings distribution, but not for those at the bottom or the top of earnings.

Discussion

Demographic trends and impending reforms suggest that Social Security will likely replace a smaller share of pre-retirement earnings than it does today, increasing the importance of employer-sponsored retirement plans in providing adequate income. Although 'auto-pilot' features in 401(k) plans have been linked to increased participation rates, relatively little is known about how such plan features may affect the distribution of tax-deferred contributions on a national scale. This paper aims to fill some of that gap in the literature and to inform the policy debate on the evolution of retirement income security. We analyze the relationship between automatic enrollment and DC contributions using data from the first nationally representative survey that asks respondents about autoenrollment. The results suggest that the relationship between automatic enrollment and DC contributions may be more ambiguous than policymakers expect.

Consistent with other studies, the results show that automatic enrollment is associated with a higher proportion of older workers included in DC plans—particularly short-tenure workers and the lowest earners. Something not highlighted in other studies, however, is the relationship between automatic enrollment and total DC contributions. Controlling for a number of different factors, we find that automatic enrollment is associated with a lower likelihood that older workers will contribute to their DC plans. As a result, employee contribution amounts and contribution rates are on average *lower* among those who report having been automatically enrolled compared with those who were given a choice to enroll. However, we also find that automatic enrollment is associated with an increased probability that older workers' employers will contribute to their plans. As a result, employer contribution amounts and contribution rates are on average *higher* among autoenrolled workers than voluntarily enrolled workers.

There could be a number of different drivers behind these results. Workers who are automatically enrolled might be less inclined to save than those who opted-in. Alternatively, autoenrolled workers might be more likely than voluntarily enrolled workers to be in noncontributory plans, particularly if the Pension Protection Act of 2006 (PPA) is successful in encouraging employers to institute automatic enrollment and those employers are more likely to opt for providing nonelective contributions to avoid nondiscrimination tests.[9] Not only would this explain the higher incidence and higher magnitude of employer contributions for automatically enrolled workers, it would also explain the lower incidence and lower magnitude of employee contributions. Workers in noncontributory plans do not have to contribute in order to participate in the plan, and they might be less inclined to contribute because their employers do (substitutability between employee and employer contributions). Finally, compared with workers who opted in and made a conscious decision to participate, automatically enrolled workers might be less aware of where contributions to their plan come from and may misclassify an employee default contribution as being made by the employer. The HRS does not allow us to fully disentangle these potential effects, but it does provide evidence that supports differences in the composition of plans between autoenrolled and voluntarily enrolled workers.

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[9] Safe harbor rules allow employers to avoid nondiscrimination tests if they match employees' contributions (up to 4 percent of pay under the 401(k) safe harbor or 3.5 percent of pay under the PPA automatic enrollment safe harbor) *or* provide a nonelective contribution of at least 3 percent of compensation for all eligible employees.

In any case, our results show that the higher employer contributions associated with automatic enrollment are not high enough to offset the lower employee contributions. The combined effect is that the retirement accounts of automatically enrolled older workers receive, on average, $900 less in annual total contributions and 1.6 percentage points lower total contribution rates than those of voluntarily enrolled workers.

Overall, our findings based on the HRS data suggest that while automatic enrollment is effective at expanding enrollment of older workers in DC plans, it needs to do a better job of both increasing the share of workers who contribute and boosting overall contribution levels. Nevertheless, there are two important caveats to keep in mind. First, because this analysis focuses on older workers, our results may not generalize to all workers. Second, because the HRS does not include much information on retirement plan provisions, we can only hypothesize possible explanations for our results. The PPA included several features designed to enhance DC plans, which also increased employers' choice of plan provisions. Features such as new protections for automatic enrollment (through preempting state payroll-withholding laws and expanding employer fiduciary protections) and more advantageous nondiscrimination safe harbor rules for employers who adopt automatic enrollment might lead to significant shifts in the composition of DC plans. Consequently, employer decisions regarding retirement provisions will likely play an increasingly larger role in employee savings behavior and ultimately their retirement account balances.

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Table 1. Share of Workers Ages 55 to 69 Included in a DC Plan among Those Offered a Plan, by Autoenrollment Status (%)

	Auto Enrolled	Voluntarily Enrolled	
Overall	92.7	84.9	***
Job Tenure			
Long-tenure worker	95.3	90.5	***
Short-tenure worker	80.8	68.2	***
Earnings Quintile			
Bottom	91.0	51.6	***
Second	84.9	71.8	**
Third	88.1	79.1	**
Fourth	92.4	90.5	
Top	97.4	96.1	*

Source: Authors' calculations from the 2008 and 2010 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** p<0.01, **p<0.05, * p<0.1

Table 2. Share of Workers Ages 55 to 69 Who Contribute or Whose Employer Contributes to Their DC Plan among Those Included in a Plan, by Autoenrollment Status (%)

	Employee Contributes			Employer Contributes		
	Auto Enrolled	Voluntarily Enrolled		Auto Enrolled	Voluntarily Enrolled	
Overall	65.3	95.5	***	90.6	86.8	***
Job Tenure						
Long-tenure worker	65.3	95.6	***	91.7	86.9	***
Short-tenure worker	65.2	94.8	***	85.7	86.2	
Earnings Quintile						
Bottom	59.2	90.8	***	92.1	85.1	**
Second	56.1	90.6	***	92.9	87.3	**
Third	62.1	96.1	***	88.7	88.9	
Fourth	64.5	96.0	***	87.1	88.3	*
Top	70.8	97.0	***	92.9	84.5	***

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** $p<0.01$, **$p<0.05$, * $p<0.1$

Table 3. Median Contribution Amounts among Workers Ages 55 to 69 Included in a DC Plan, by Autoenrollment Status (2012 dollars)

	Employee Contributions			Employer Contributions			Total Contributions		
	Auto Enrolled	Voluntarily Enrolled		Auto Enrolled	Voluntarily Enrolled		Auto Enrolled	Voluntarily Enrolled	
Overall	1,293	3,354	***	2,248	1,608	***	4,800	6,072	**
Job Tenure									
Long-tenure worker	1,396	3,515	***	2,540	1,726	***	5,696	6,480	**
Short-tenure worker	751	2,685	***	1,700	1,398		2,743	5,034	**
Earnings Quintile									
Bottom	171	577	***	521	450		973	1,065	
Second	459	1,069	***	940	740		1,754	2,009	*
Third	737	1,903	***	1,080	1,119		2,997	3,330	*
Fourth	1,591	3,355	***	2,007	1,691		5,131	5,760	*
Top	5,716	8,700	***	5,187	3,366	***	12,350	13,156	

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** $p<0.01$, **$p<0.05$, * $p<0.1$

Table 4. Median Contribution Rates among Workers Ages 55 to 69 Included in a DC Plan, by Autoenrollment Status (%)

	Employee Contributions			Employer Contributions			Total Contributions		
	Auto Enrolled	Voluntarily Enrolled		Auto Enrolled	Voluntarily Enrolled		Auto Enrolled	Voluntarily Enrolled	
Overall	3.0	6.0	***	4.4	3.0	***	10.0	11.0	*
Job Tenure									
Long-tenure worker	3.7	6.0	***	5.0	3.0	***	10.9	11.0	
Short-tenure worker	3.0	6.0	***	3.0	3.0		8.0	10.0	
Earnings Quintile									
Bottom	1.5	5.0	**	3.0	3.0		7.0	10.0	
Second	1.9	5.0	***	4.0	3.0		8.0	8.8	
Third	2.0	5.0	***	3.0	3.0		8.0	10.0	
Fourth	3.0	6.0	***	3.0	3.0	*	10.0	11.0	
Top	6.0	8.5	***	5.0	3.0	***	12.0	12.5	

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** p<0.01, **p<0.05, * p<0.1

Table 5. Linear Probability Model of Being Included in a DC Plan if Offered among Workers under Age 70

Variable	Pr(included in DC plan=1|offered DC plan=1)		
	(1)	(2)	(3)
[omitted group: <50]			
Age 50-59	0.048*	0.049*	0.050*
Age 60-69	-0.007	-0.005	-0.004
Male	-0.038***	-0.038***	-0.038***
High school graduate	-0.011	-0.011	-0.005
Some college	-0.019	-0.018	-0.014
College	-0.014	-0.014	-0.013
Black	-0.007	-0.006	-0.005
Other	0.018	0.017	0.020
In a coupled household	0.011	0.012	0.013
Log other income	0.002	0.002	0.002
Log wealth	0.012***	0.012***	0.012***
Spouse contributes to DC	0.048***	0.048***	0.049***
Short-tenure (tenure <=4 years)	-0.174***	-0.200***	-0.174***
Bottom earnings quintile	-0.163***	-0.163***	-0.198***
2nd earnings quintile	-0.096***	-0.097***	-0.105***
4th earnings quintile	0.073***	0.072***	0.095***
Top earnings quintile	0.106***	0.107***	0.134***
Year 2008	0.035***	0.037***	0.035***
Automatic enrollment	**0.106***	**0.079***	**0.141***
*Automatic enrollment * Short-tenure*		0.124***	
*Automatic enrollment * Bottom quintile*			0.152**
*Automatic enrollment * 2nd quintile*			0.051
*Automatic enrollment * 4th quintile*			-0.091**
*Automatic enrollment * Top quintile*			-0.100***
Pseudo R^2	0.1852	0.1857	0.1855
Number of observations	3,398	3,398	3,398

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers under age 70 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** $p<0.01$, **$p<0.05$, * $p<0.1$

Table 6. Linear Probability Model of Contributing to a DC Plan among Workers under Age 70 Included in a Plan

| | Pr(contribute to DC plan=1\|included in DC plan=1) | | | | | |
| | Employee Contributes | | | Employer Contributes | | |
Variable	(1)	(2)	(3)	(4)	(5)	(6)
[omitted group: <50]						
Age 50-59	0.019	0.021	0.019	-0.002	-0.002	-0.002
Age 60-69	0.006	0.008	0.006	0.004	0.004	0.003
Male	-0.005	-0.005	-0.004	0.006	0.006	0.006
High school graduate	0.019	0.018	0.019	-0.020	-0.020	-0.019
Some college	0.018	0.017	0.018	-0.011	-0.011	-0.010
College	0.025	0.025	0.025	-0.027	-0.027	-0.027
Black	0.014	0.014	0.014	-0.006	-0.006	-0.006
Other	0.017	0.015	0.017	-0.004	-0.004	-0.006
In a coupled household	-0.014	-0.012	-0.014	-0.009	-0.009	-0.009
Log other income	0.002	0.002	0.002	-0.002	-0.002	-0.002
Log wealth	0.001	0.000	0.001	0.000	0.000	0.000
Spouse contributes to DC	0.021	0.020	0.021	0.007	0.007	0.007
Short-tenure (tenure <=4 years)	0.021*	0.001	0.021*	0.000	0.002	-0.001
Bottom earnings quintile	-0.061**	-0.061**	-0.063**	-0.093***	-0.093***	-0.069**
2nd earnings quintile	-0.026	-0.027	-0.028*	0.019	0.019	0.010
4th earnings quintile	0.011	0.011	0.012	-0.005	-0.005	0.007
Top earnings quintile	0.044***	0.044***	0.038***	-0.000	-0.000	-0.005
Year 2008	0.016	0.016	0.016	-0.024**	-0.024**	-0.024**
Year 2010	0.021*	0.020	0.021*	-0.076***	-0.076***	-0.076***
Year 2012	0.008	0.007	0.009	-0.115***	-0.115***	-0.116***
Automatic enrollment	**-0.323***	**-0.339***	**-0.331***	**0.029**	**0.030**	**0.035**
*Automatic enrollment * Short-tenure*		0.084**			-0.006	
*Automatic enrollment * Bottom quintile*			0.009			-0.084
*Automatic enrollment * 2nd quintile*			0.006			0.040
*Automatic enrollment * 4th quintile*			-0.005			-0.050
*Automatic enrollment * Top quintile*			0.025			0.019
Pseudo R^2	0.1445	0.1447	0.1452	0.0444	0.0452	0.0474
Number of observations	5,453	5,453	5,453	5,330	5,330	5,330

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers under age 70 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** $p<0.01$, **$p<0.05$, * $p<0.1$

Table 7. OLS Regression of Contribution Amounts among Workers under Age 70 Included in a DC plan

Variable	Employee Contribution			Employer Contribution			Total Contribution		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
[omitted group: <50]									
Age 50-59	1321.5***	1344.3***	1348.6***	398.6	394.0	362.7	1745.7***	1783.6***	1750.4***
Age 60-69	989.2***	1010.7***	1027.0***	-62.0	-66.7	-117.2	902.2**	939.1**	908.9**
Male	545.5***	546.6***	517.7***	321.8**	321.8**	343.3**	873.0***	872.8***	868.0***
High school graduate	91.2	79.5	133.8	-16.3	-14.0	-40.8	157.3	137.5	169.1
Some college	-17.1	-26.6	33.9	208.1	210.0	173.0	215.8	197.3	225.5
College	1199.9***	1192.3***	1244.2***	692.9***	694.9***	659.9**	1887.3***	1870.2***	1893.4***
Black	-124.4	-126.0	-112.9	348.3	348.4	324.5	174.5	172.3	181.4
Other	-34.4	-57.0	-0.4	386.7	390.4	361.6	439.8	410.0	442.8
In a coupled household	-354.4*	-343.3*	-332.2*	132.3	130.9	127.4	-286.3	-274.9	-280.9
Log other income	88.4***	86.8***	88.9***	-22.6	-22.3	-24.4	76.0**	73.5**	76.2**
Log wealth	166.0***	165.5***	165.0***	19.2	19.3	20.9	197.0***	195.9***	196.4***
Spouse contributes to DC	336.1	334.9	328.1	56.6	56.4	64.6	449.9	449.8	449.2
Short-tenure (tenure <=4 years)	-87.2	-276.1	-82.0	-359.7**	-331.8*	-368.3**	-452.5*	-676.6**	-453.2*
Bottom earnings quintile	-1289.6***	-1294.3***	-1464.7***	-1042.9***	-1042.2***	-1042.1***	-2479.8***	-2487.9***	-2629.0***
2nd earnings quintile	-950.7***	-951.6***	-993.9***	-669.8***	-670.0***	-681.1***	-1858.1***	-1857.3***	-1899.8***
4th earnings quintile	1256.3***	1260.3***	1378.6***	615.4***	614.2***	538.9***	1837.3***	1846.1***	1866.9***
Top earnings quintile	5400.1***	5398.0***	5942.4***	3028.6***	3028.4***	2530.6***	8505.4***	8507.2***	8570.8***
Year 2008	62.3	65.6	40.5	-526.8***	-526.5***	-509.8***	-517.9*	-518.0*	-524.7*
Year 2010	-486.6***	-490.8***	-504.8***	-1144.7***	-1143.3***	-1126.0***	-1640.4***	-1650.4***	-1645.6***
Year 2012	-129.9	-139.4	-161.0	-1376.1***	-1374.2***	-1346.5***	-1408.6***	-1423.8***	-1414.6***
Automatic enrollment	**-1684.1***	**-1844.5***	**-913.2***	**841.2***	**865.8***	**6.2**	**-914.0***	**-1113.7***	**-848.3**
*Automatic enrollment * Short-tenure*		823.7**			-125.3			1012.6	
*Automatic enrollment * Bottom quintile*			451.6			147.0			539.5
*Automatic enrollment * 2nd quintile*			201.9			79.2			182.8
*Automatic enrollment * 4th quintile*			-499.6			355.1			-126.9
*Automatic enrollment * Top quintile*			-2248.0***			2152.7***			-269.7
	1321.5***	1344.3***	1348.6***	398.6	394.0	362.7	1745.7***	1783.6***	1750.4***
Pseudo R²	0.363	0.364	0.369	0.147	0.147	0.154	0.377	0.377	0.377
Number of observations	5,019	5,019	5,019	4,278	4,278	4,278	4,158	4,158	4,158

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers under age 70 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
Significance: *** p<0.01, **p<0.05, * p<0.1

Table 8. OLS Regression of Contribution Rates among Workers under Age 70 Included in a DC plan

Variable	Employee Contribution			Employer Contribution			Total Contribution		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
[omitted group: <50]									
Age 50-59	0.734**	0.754**	0.738**	0.176	0.156	0.135	1.045*	1.075*	1.017*
Age 60-69	1.190***	1.210***	1.195***	0.092	0.072	0.034	1.817***	1.846***	1.783***
Male	0.243	0.245	0.239	0.525**	0.526**	0.544**	0.655*	0.655*	0.665*
High school graduate	0.842**	0.831**	0.855**	0.024	0.034	0.016	0.880	0.863	0.875
Some college	0.951***	0.942***	0.966***	0.359	0.367	0.331	1.214*	1.199*	1.199*
College	1.433***	1.427***	1.447***	0.229	0.237	0.200	1.684**	1.670**	1.664**
Black	-0.274	-0.276	-0.273	0.507	0.508	0.501	0.199	0.197	0.199
Other	0.557	0.536	0.557	0.389	0.405	0.371	1.254*	1.230*	1.240*
In a coupled household	-0.435	-0.425	-0.432	-0.079	-0.085	-0.078	-0.662	-0.653	-0.662
Log other income	0.149***	0.148***	0.150***	0.008	0.009	0.007	0.177***	0.175***	0.177***
Log wealth	0.189***	0.189***	0.189***	0.001	0.001	0.002	0.261***	0.260***	0.262***
Spouse contributes to DC	0.166	0.164	0.162	0.000	-0.000	0.006	0.366	0.366	0.368
Short-tenure (tenure <=4 years)	-0.251	-0.422*	-0.251	-0.253	-0.132	-0.255	-0.568	-0.747*	-0.570
Bottom earnings quintile	-0.255	-0.261	-0.176	0.017	0.021	-0.063	-0.871	-0.879	-0.910
2nd earnings quintile	-0.990***	-0.992***	-1.026***	-0.594*	-0.595*	-0.838**	-2.467***	-2.467***	-2.603***
4th earnings quintile	0.711***	0.713***	0.756**	-0.243	-0.248	-0.431	-0.101	-0.094	-0.163
Top earnings quintile	1.499***	1.496***	1.601***	-0.082	-0.082	-0.573*	0.477	0.478	0.175
Year 2008	-0.043	-0.040	-0.048	-0.933***	-0.932***	-0.918***	-0.621	-0.621	-0.613
Year 2010	-0.743***	-0.747***	-0.746***	-1.955***	-1.949***	-1.944***	-2.609***	-2.617***	-2.601***
Year 2012	-0.494**	-0.502**	-0.501**	-2.232***	-2.224***	-2.213***	-2.359***	-2.370***	-2.346***
Automatic enrollment	**-2.599***	**-2.743***	**-2.421***	**1.089***	**1.196***	**-0.052**	**-1.609***	**-1.769***	**-2.234***
*Automatic enrollment * Short-tenure*		0.744			-0.540			0.806	
*Automatic enrollment * Bottom quintile*			-0.303			0.487			0.254
*Automatic enrollment * 2nd quintile*			0.155			1.120			0.625
*Automatic enrollment * 4th quintile*			-0.188			0.867			0.302
*Automatic enrollment * Top quintile*			-0.425			2.168***			1.343
Pseudo R²	0.116	0.116	0.115	0.022	0.022	0.024	0.061	0.061	0.061
Number of observations	4,978	4,978	4,978	4,266	4,266	4,266	4,140	4,140	4,140

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers under age 70 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.
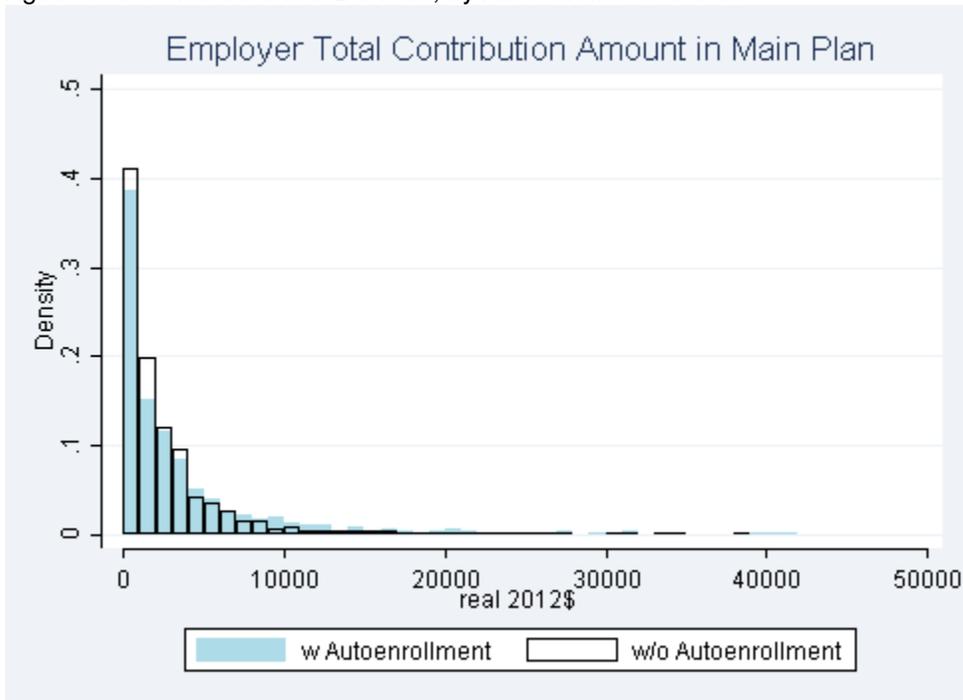Significance: *** p<0.01, **p<0.05, * p<0.1

Figure 1. Distribution of Employee Contribution Amounts among Workers
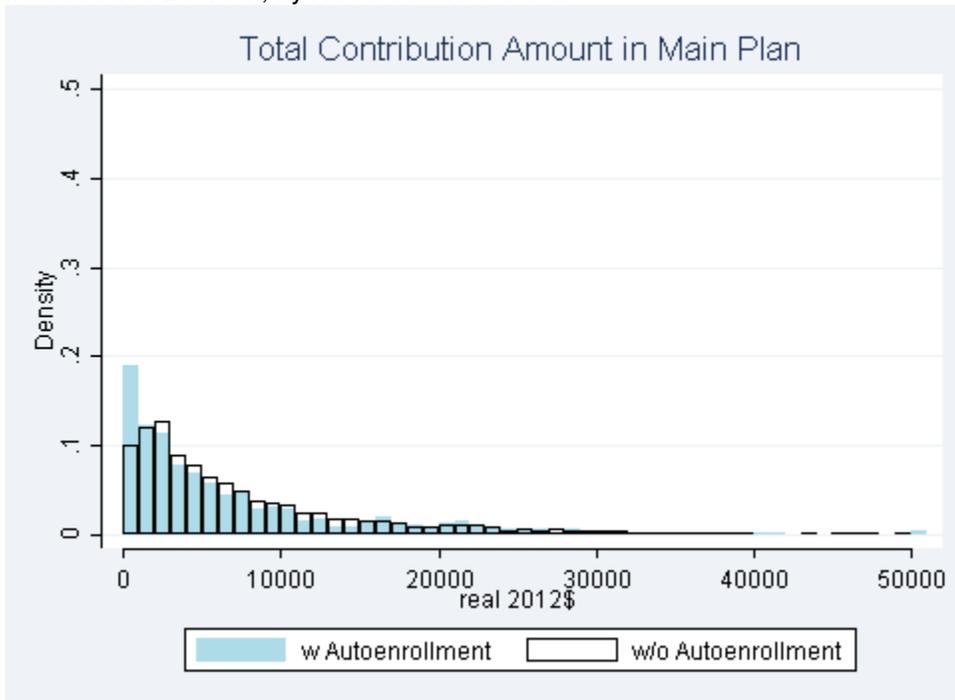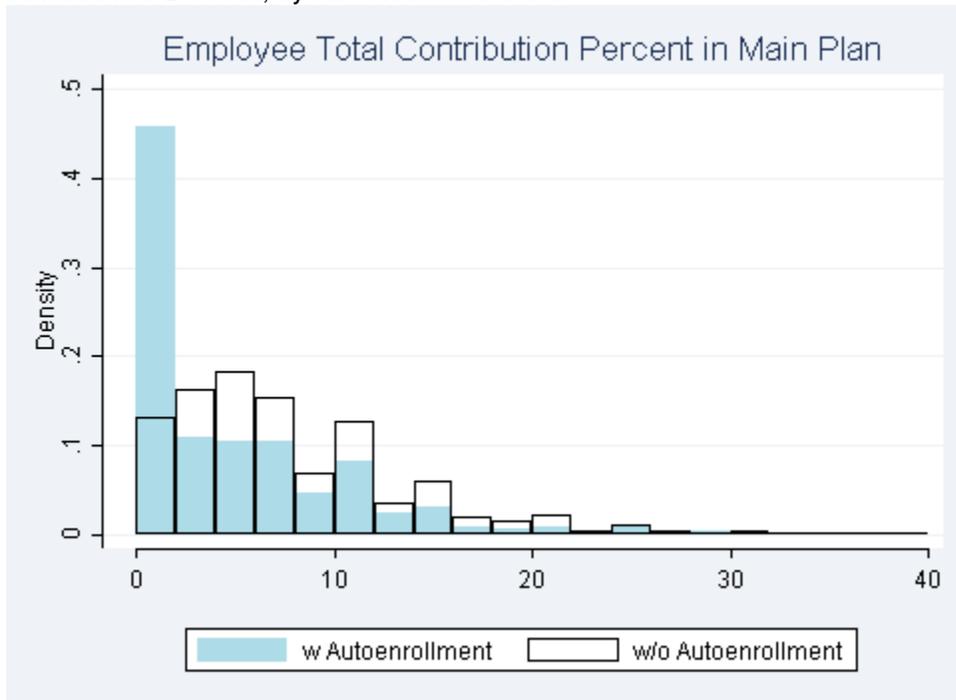Ages 55 to 69 Included in a DC Plan, by Autoenrollment Status
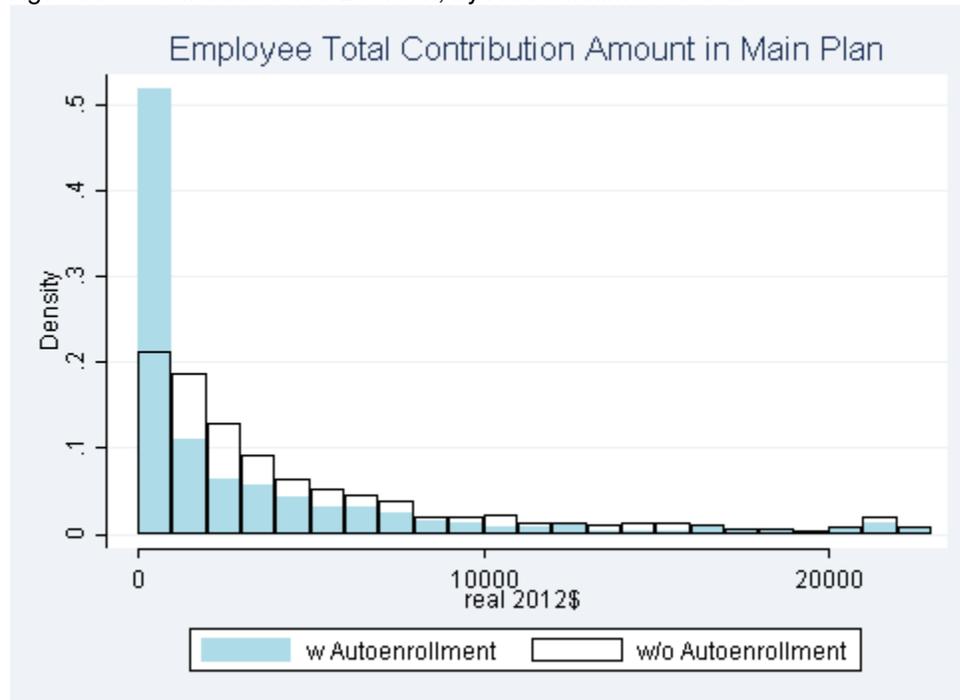
Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive
wages. Respondents are included in a plan if they report being included and they or their employer
contributes to their DC plan.

Figure 2. Distribution of Employer Contribution Amounts among Workers
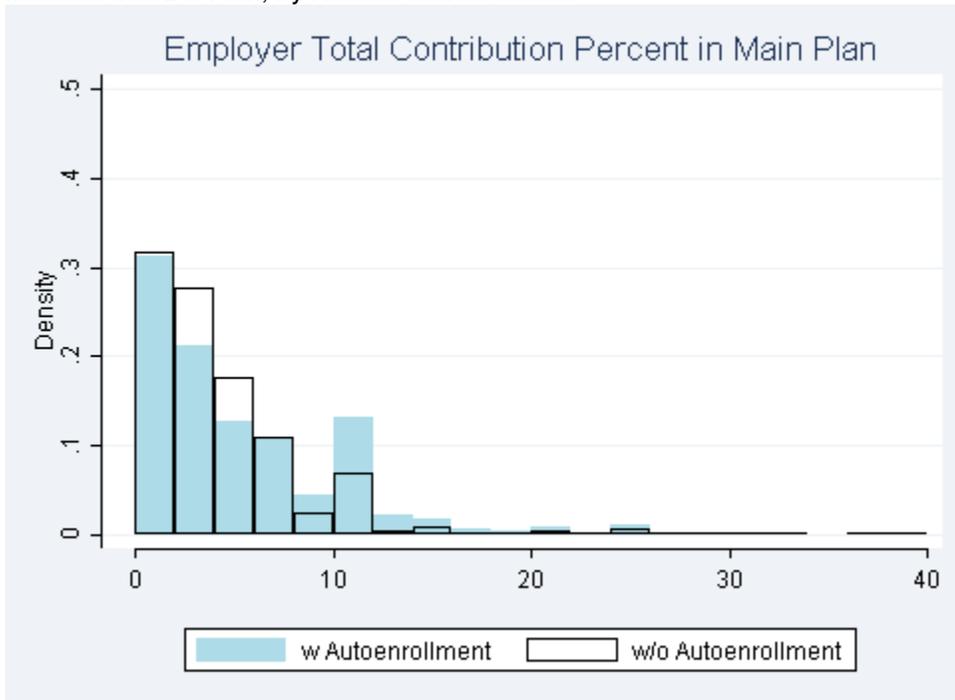Ages 55 to 69 Included in a DC Plan, by Autoenrollment Status

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive
wages. Respondents are included in a plan if they report being included and they or their employer
contributes to their DC plan.

Figure 3. Distribution of Total Contribution Amounts among Workers Ages 55 to 69
Included in a DC Plan, by Autoenrollment Status

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive
wages. Respondents are included in a plan if they report being included and they or their employer
contributes to their DC plan.

Figure 4. Distribution of Employee Contribution Rates among Workers Ages 55 to 69
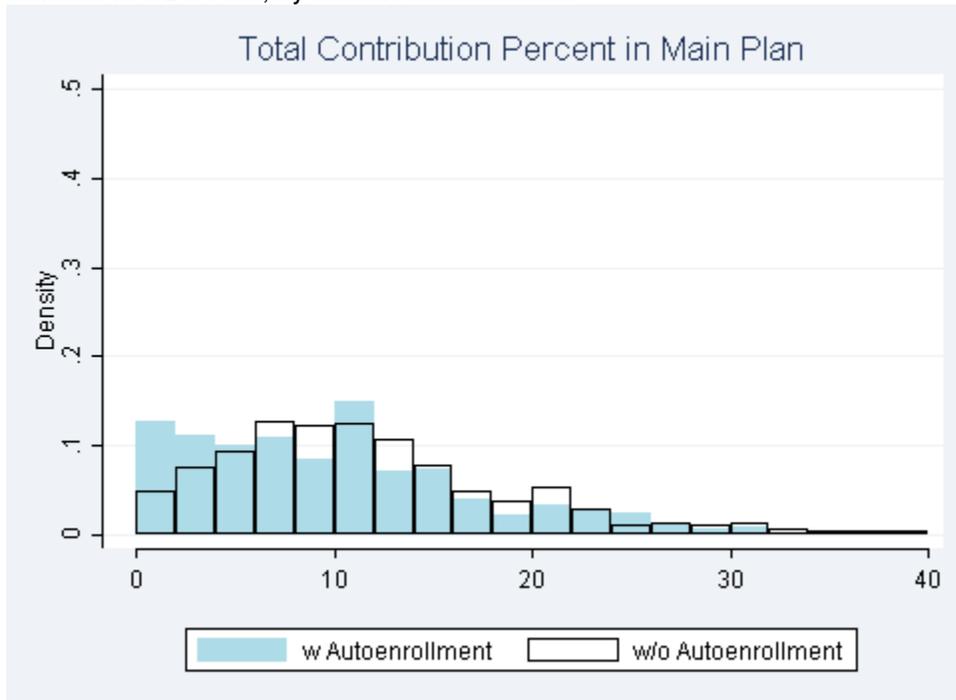Included in a DC Plan, by Autoenrollment Status

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive
wages. Respondents are included in a plan if they report being included and they or their employer
contributes to their DC plan.

Figure 5. Distribution of Employer Contribution Rates among Workers Ages 55 to 69 Included in a DC Plan, by Autoenrollment Status

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive wages. Respondents are included in a plan if they report being included and they or their employer contributes to their DC plan.

Figure 6. Distribution of Total Contribution Rates among Workers Ages 55 to 69
Included in a DC Plan, by Autoenrollment Status

Source: Authors' calculations from the 2006-2012 waves of the Health and Retirement Study.
Notes: Sample includes workers ages 55 to 69 who are not self-employed and who report positive
wages. Respondents are included in a plan if they report being included and they or their employer
contributes to their DC plan.