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# PLAN DESIGN AND PARTICIPANT BEHAVIOR IN DEFINED CONTRIBUTION RETIREMENT PLANS: PAST, PRESENT, AND FUTURE

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## ABSTRACT

I review the academic literature on defined contribution retirement plan design and participant behavior. While adoption of automatic enrollment has significantly increased participation rates, recent studies find the long-run effects on savings are smaller than the short-run effects, with some savings financed via debt. I also review efforts to expand access to employer-based retirement savings and liquid savings, the pros and cons of target date funds as default investment options, potential conflicts of interest in plan design, and potential benefits of customized defaults. I conclude by discussing how SECURE 2.0 may impact US workers and highlighting topics for future research.

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There are ongoing debates about the extent to which US households, and particularly those with lower earnings, are saving enough for retirement.[1] Because private retirement savings in the US primarily accrue through employer-sponsored defined contribution (DC) retirement plans, such as 401(k) plans, there is renewed interested by policymakers, practitioners, and academics in improving plan design and expanding access.[2] In this chapter, I review the latest evidence on how employees have responded to changes in retirement plan design that were intended to increase participation rates, savings rates, and exposure to equity markets, discuss the potential impact of recent regulation, and highlight areas where additional research is needed.

DC retirement plans are the means to an end: retirement income above and beyond that available from other sources. When discussing plan design, it is helpful to model them as a savings account in a classic lifecycle model (Gomes et al. 2021).[3] If we make the (unrealistic) assumption that all employees are capable of determining their optimal savings rates and asset allocations each period, then a well-designed plan is one that provides participants with a sufficiently rich set of investment options that they can create custom portfolios based on their individual characteristics and preferences, at a reasonable cost.[4][5] The only optimizing employees who will not choose to participate are those for whom the expected benefits of participating fall short of the costs in terms of forgone consumption or alternative savings (such as paying down student loans).

[1] On the one hand, many households that earn low wages are reliant upon Social Security benefits for retirement income. On the other, Social Security replacement rates are the highest for this group of workers (assuming steady employment histories). See, for example, Figure 8.3 in Investment Company Institute (2023).
[2] According to Investment Company Institute (2023), 'assets earmarked for retirement' totaled $33.6 trillion at the end of 2022 (p. 99).
[3] Gomes et al. (2021)'s review of the literature on household finance links lifecycle model considerations to the literature on retirement savings and financial advice.
[4] I assume that the fraction of plan costs covered by the employer and the generosity of the employer match (i.e., the size of the transfers from employers to plan participants) are determined by the competitiveness of the labor market.
[5] In their review of the literature on financial advice, Reuter and Schoar (2024) emphasized the difficulty of identifying optimal portfolios in real-world data.

Optimal plan design becomes more complicated when we acknowledge that some employees lack the financial literacy and investment experience required to determine their optimal savings rates and asset allocations.[6] In practice, households must decide how much to save each period, whether to save through employer-sponsored retirement plans or individual retirement plans, how to invest retirement contributions throughout the accumulation phase, when to retire, when to claim government-provided retirement benefits like Social Security, and how to manage assets during the decumulation phase, including the potential purchase of life annuities. The fact that these are difficult decisions to make does not change the reality that households are responsible for making them, but it does suggest that households with lower levels of financial literacy may be inclined to outsource decision-making to others, or to avoid saving for retirement all together.

One challenge for plan sponsors is to design retirement plans that move unsophisticated employees closer to their optimal savings rates and asset allocations (than if they were left to their own devices), while simultaneously providing sophisticated employees with the investment options needed to pursue their optimal savings rates and asset allocations. This is where nudges like automatic enrollment and default investment options have come to play an important role. A second challenge for plan sponsors is to accommodate the (potentially) heterogeneous needs of less-sophisticated employees, which may necessitate more sophisticated defaults.

I begin by reviewing evidence on suboptimal investment behavior in the days before automatic enrollment (AE) and then consider the potential benefits of AE and active choice relative to voluntary enrollment (VE). I also examine the intended and unintended consequences of

[6] Lusardi and Mitchell (2023) provide an up-to-date review on the literature on the benefits of financial literacy. For example, Clark, Lusardi, and Mitchell (2017) documented higher participation and savings rates within the Thrift Savings Plan (TSP) for employees with higher levels of financial literacy. They also demonstrated that employees who complete a 'Learning Module' about retirement planning are more likely to start contributing and less likely to stop contributing. In another chapter of this volume, Heimer (2024) highlights the role subjective beliefs plays in consumption, savings, and consumption decisions.

replacing money market funds with target date funds (TDFs) as default investment options and discuss the potential value of customized defaults. Next, I review the evidence on expanding access to employer-based retirement plans and liquid savings in the UK and US. Then, I summarize new evidence on how households finance incremental savings under AE, and how the short-run effects of AE likely overstate long-run changes in savings. I conclude by discussing potential conflicts of interest in plan design, the possible outcomes of recent regulation intended to increase participation rates and savings in the US, and areas where additional research is needed. Readers interested in learning more about the heterogeneous effects of automating retirement and non-retirement savings should read the chapter authored by Chin et al. (2024), while those interested in learning more about how (and why) consumption and savings vary over the lifecycle should read the chapters authored by Heimer (2024) and Olafsson and Pagel (2024).[7]

**Evidence on Suboptimal Participant Behavior**

Before describing how DC retirement plans have evolved, it is helpful to review the early evidence on how some DC plan participants (mis)managed their retirement portfolios. In their '1/N' paper, Benartzi and Thaler (2001) cast doubt on the idea that plan participants construct optimal portfolios.[8] Instead, they found that plan participants relied upon naïve diversification strategies when constructing retirement plan portfolios. Specifically, including more equity funds in the menu resulted in a larger average allocation to equity, even when there are no incremental benefits from diversification. Huberman and Jiang (2006) revisit this finding using account-level

[7] Heimer (2024) presents evidence that younger individuals tend to underestimate their life expectancy while older individuals tend to overestimate it. These systematic deviations between subjective and objective survival probabilities lead individuals to consume too much when young and too little when old. Using transaction-level data from Iceland, Olafsson and Pagel (2024) document that consumption falls following retirement, but both liquid savings and wealth rise.

[8] An optimal portfolio offers the highest expected return for a given level of portfolio risk. The optimal portfolio for a specific investor depends on their optimal level of portfolio risk, which depends on their risk tolerance, investment horizon, wealth level, riskiness of their labor income, etc.

data from 640 DC plans administered by Vanguard. While they did find evidence of a 1/N effect, in the sense that participants typically allocate contributions equally across a small number of funds, they do not confirm that average allocations to equity increased with the fraction of equity funds in the menu.[9] They concluded that 'the absence of a relation between equity allocation and equity exposure suggests that *menu design is not important* and that the data fail to reject the null hypothesis of rationality in favor of the alternative that plan menus influence participants' equity allocations' (p. 764; *emphasis added by me*). Yet, this was neither a particularly powerful test of investor rationality nor of the quality of DC investment menus. Tang et al. (2010) analyzed account-level data from 2004 for an even larger sample of DC plans managed by Vanguard. They showed that approximately 94 percent of plans offered efficient investment menus, but that 'most participants fail to construct an optimal portfolio from the menu offered to them by their plan sponsors' (p. 1080). The authors' headline estimate was that inefficiently constructed portfolios reduced retirement wealth by as much as one-fifth over a 35-year horizon.

Choi et al. (2009) exploited a 2003 change in how a single firm made 401(k) matching contributions to test for 'mental accounting.' Before the change, participants selected how their contribution was allocated, and all matching took the form of company stock. After the change, participants selected the asset mix for both employee and employer contributions. Fully rational employees should have set a lower allocation to company stock before the change, internalizing the fact that the employer match was entirely in company stock. Instead, consistent with mental accounting, participants before the change appeared to ignore how the employer match was

[9] Consistent with Benartzi and Thaler (2001), Brown et al. (2007) showed that within-plan, time-series variation in the fraction of equity funds on the investment menu was positively associated with time-series variation in participant holdings of equity funds. Morrin et al. (2012) found that when a single retirement plan increased its menu size from 10 to 19 funds, new employees were more likely to accept the default investment option, but new employees who constructed their own portfolios invested in a larger number of funds when the fund menu was larger.

allocated. Specifically, the authors found that participants chose similar average allocations to company stock under both regimes, implying very different allocations to company stock after six months (58.7% versus 27.4%).

There are related questions about the extent to which some participants are willing and able to manage their retirement savings portfolios over time. Acceptance of the *status quo* can give rise to excess inertia. Samuelson and Zeckhauser (1998) provided real-world evidence of *status-quo* bias in a study of approximately 850,000 Teachers Insurance and Annuity Association (TIAA) participants' allocations of retirement contributions, between a fixed-income (TIAA) fund and a diversified common stock (CREF) fund. Following participants from 1981 to 1986, they showed that 'changes in allocations year by year are insignificant—despite large variations in TIAA and CREF rates of return' (p. 32). They also reported that fewer than 2.5 percent of participants in the plan for at least 12 years made a change to their asset allocations in any given calendar year. Those authors did not discuss whether participants transferred money between the two funds without adjusting their future asset mix, which is the more efficient way to rebalance portfolios, but which they were never prompted to do. Agnew et al. (2003) studied trading behavior in a single large 401(k) plan from 1994 to 1998. They found that extreme asset allocations were common, with 47.6 percent of participants allocating nothing to equity. They also found that changes in allocations were relatively uncommon, with 87.6 percent of accounts making no trades in a given year. This paper is widely cited as evidence that DC plan participants fail to revisit their initial asset allocation choices.[10]

Finally, as Poterba (2003) emphasized, it is generally unwise for employees to hold concentrated positions in their employer's stock. Using data disclosed in Form 11-K for fiscal year

[10] Similarly, Sialm et al. (2015) documented that flows between investment options in retirement plans were driven primarily by menu changes initiated by plan sponsors.

1993, Benartzi (2001) showed that approximately 25 percent of discretionary contributions in 401(k) plans were invested in company stock. Moreover, allocations to company stock were higher when company stock returns had been higher, but these higher allocations did not predict higher future returns. Among the 20 largest DC plans in 2001, Poterba (2003) reported an average allocation to company stock of 44.3 percent, even though, over the same time period, the average standard deviation of company stock was 35.7 percent, versus only 15.8 percent for the S&P 500 Index. His simulations confirmed that large allocations to company stock significantly reduced expected utility.

Following the Pension Protection Act of 2006, which allowed employees to convert company stock holdings into other investments, holdings of company stock have declined. According to Vanguard (2024), among plans offering company stock, the fraction of participants with a positive allocation to company stock declined from 50 percent in 2014 to 31 percent in 2023. Collectively, this research implies that at least some participants would benefit from outsourcing their asset allocation decisions, as has become increasingly common.

**Defaults Changed Everything**

The ongoing transition from voluntary enrollment (VE) to automatic enrollment (AE) has had enormous implications for participant behavior.[11] When a retirement plan begins automatically enrolling new employees in its retirement plan (i.e., giving them the option to opt out instead of requiring them to opt in), they are enrolled at the default savings rate and their contributions are invested in the default investment option. In a now-famous study, Madrian and

[11] McDonald's Corporation pioneered the use of automatic enrollment in its 401(k) plan in 1984, and the feature was officially endorsed by the Internal Revenue Service in 1998 (Crowney 2002). Interestingly, McDonald's switched back to voluntary enrollment in 2002, as part of a 'holistic, integrated look at our plan' (as quoted in Crowney 2002). McDonald's introduced a generous employer match in 2004 (Probasco 2014) but continues to rely on voluntary enrollment for most employees.

Shea (2001) compared the choices of employees who joined a firm after the introduction of AE, to employees who joined under the previous VE regime. Their empirical setting was the 401(k) plan of a 'large, publicly traded Fortune 500 company in the health care and insurance industry' (p. 1151). The authors have four main findings. First, switching from VE to AE increased plan participation rates from 49 percent to 86 percent. Second, there were heterogeneous treatment effects: the largest increases in participation were observed among younger, lower-income, and Black and Hispanic employees. Third, conditional on participating, average employee savings rates decreased. In particular, the modal savings rate decreases from 6 percent to 3 percent, and the average savings rate decreased from 7.3 percent to 4.4 percent. While some of these decreases were likely driven by acceptance of the 3 percent default rate by employees that would have not voluntarily enrolled, there were not enough new participants to rationalize the full decline. Fourth, the fraction of employees that allocated all of their contributions to the (default) money market fund jumped from 6.4 percent to 80.0 percent.

The findings were consistent with those in Choi et al. (2004), who extended the analysis to include two additional large firms and followed participants for up to 48 months. Participation rates were significantly higher under AE and remained high. At the same time, 65-87 percent of new plan participants both saved at the default contribution rate and invested exclusively in the default investment option. The authors noted that '[t]his percentage declines slowly over time, falling to 40-54 percent after two years of tenure, and to about 45 percent after three years of tenure (in the two companies for which data extends this far)' (p. 83). In other words, the authors documented that widespread acceptance of default options boosted participation, but reduced dispersion in participant outcomes for at least three years relative to plans without defaults. As a result, there were heterogeneous treatment effects. Those employees who would not have

participated under VE arguably benefited from the positive contribution rates under AE, despite the low-risk default investment options. On the other hand, those employees who would have participated at a higher contribution rate under VE or chosen to hold a riskier portfolio were potentially harmed.

It is noteworthy that Madrian and Shea (2001) and Choi et al. (2004) studied the impact of AE on 401(k) plans sponsored by employers interested in experimenting with plan design. Employers offering 401(k) plans tend to pay relatively high wages and offer stable employment, and the plans often feature employer matching contributions. According to Vanguard (2024), the median participant income within 401(k) plans was $82,000 in 2023, and 96 percent of 401(k) plans offered an employer match.[12] Furthermore, the fact that the large firms featured in these papers were seeking to increase plan participation rates raises questions about external validity when AE is applied to a broader set of firms. The comprehensive literature review on automatic enrollment performed by Beshears et al. (2023) confirmed, however, that automatic enrollment has had similar effects in a wide variety of other DC retirement plans.

The early finding that reliance on defaults reduced asset accumulation for some participants arose from the interaction between low default contribution rates and low-risk default investment options. The chapter authored by Chin et al. (2024) emphasizes that the expected benefits of automating retirement (and non-retirement) savings vary with demographic characteristics, financial literacy, and the extent to which households are present biased. This begs the question of how we should think about optimal defaults in a world with heterogeneous effects. At a minimum,

[12] While I cite statistics from Vanguard (2024) throughout this chapter, it is important to recognize that the statistics on participation rates and contribution rates are based on the subset of recordkeeping clients for whom Vanguard performs nondiscrimination testing. Consequently, these statistics need not represent the broader industry. For example, in a sample of approximately 5,000 employer-sponsored DC retirement plans, Arnoud et al. (2021) reported that 80 percent of employer-sponsored plans offered an employer match in 2017, whereas Vanguard (2024, p. 5) reported that 96 percent of employer-sponsored plans offered an employer match in 2019 (and in 2023).

as discussed below, there has been movement towards higher contribution rates and riskier default investment options.

**Voluntary Enrollment, Automatic Enrollment, or Active Choice?**

The widespread acceptance of default contribution rates and default investment options in company retirement plans raises important questions about how employers should set optimal defaults. Choi et al. (2003) considered optimal default retirement savings rates when participants are assumed to be hyperbolic discounters.[13] Specifically, their model assumes that participants suffer flow welfare losses when they save too much or too little, relative to their privately optimal savings rate, but that participants must incur a one-time, time-varying adjustment cost to move away from the default contribution rate. On the one hand, when the range of privately optimal savings rates is narrow, the optimal default contribution rate is near the middle of the distribution. When the range is wide, on the other hand, such that many employees will be harmed by any particular default savings rate, the optimal default contribution rate will be close to the minimum or maximum of the distribution, because extreme defaults are the most likely to trigger active choices by employees.[14] Relatedly, when Beshears et al. (2023) studied a retirement plan with a default savings rate of 12 percent (and minimum required rate of 4%), they found that 73 percent of participants chose a different savings rate within 12 months. They interpret that fact that lower-income employees are *less* likely to deviate from the default rate as evidence that they 'face higher psychological barriers to active decision making' (p. 4). (Conditional on making any changes,

[13] As Choi et al. (2023) stated, 'the important property of these [hyperbolic] preferences is simply that they are characterized by more discounting in the short run than in the long run' (p. 181), which gives rise to time inconsistency.
[14] In a calibration exercise involving four firms, Choi et al. (2003) estimated mean actual savings rates between 2.4 percent and 8.2 percent but mean optimal default savings rates between zero percent and 15 percent. They concluded that '[f]irms whose employees have a high motive to save turn out to have higher optimal defaults than firms whose employees have a low motive to save' (p. 184).

however, the authors found that 40% of lower-income employees chose the lowest possible savings rate, versus 26% of higher-income employees.)

Goda et al. (2020) asked whether predictors of retirement contribution rates varied across AE and VE choice environments. They analyzed choices pertaining to the (supplemental DC) Thrift Savings Plan (TSP) using a combination of administrative and survey data. For employees hired before August 2010, TSP offered VE and a default contribution rate of 0%. For employees hired after this date, TSP implemented AE with a default contribution rate of 3%. The authors found higher financial literacy predicted higher contribution rates under VE, but acceptance of the default rate under AE. Controlling for survey-based measures of long-run discount rates, present bias, and exponential-growth bias, they found that present-bias (i.e., overweighting immediate benefits and costs relative to future benefits and costs) predicted acceptance of the default rate under AE, but not under VE. They concluded that 'a causal interpretation of our results suggests that auto-enrollment increases saving primarily among those with low financial literacy' (p. 314), but also cautioned against extrapolating their findings to non-government workers, who lacked DB pension benefits and faced different default contribution rates and employer matching schemes.

Carroll et al. (2009) derived conditions under which forcing employees to make active choices could dominate AE. In their model, active choice was preferred when employees have heterogeneous preferences and a strong tendency to procrastinate. This requires, however, that employees are able to map their preferences into savings rates and choices over asset allocations. When employees suffer from low levels of financial literacy, it may be optimal to combine active choices over contribution rates with reliance on default investment options, which allow participants to outsource portfolio management.

**Target Date Funds as Default Investment Options**

Before the Pension Protection Act of 2006, it was common for retirement plans that featured automatic enrollment to offer either a money market mutual fund or a stable value fund as the default investment option (as was true in the three plans studied by Choi et al. 2001). Beginning in 2007, plans were provided with a safe harbor when they defaulted participants into target date mutual funds (TDFs), balanced funds, or managed accounts (Department of Labor 2006). Of the three qualified default investment alternatives (QDIAs), TDFs have proven the most popular. According to Vanguard (2024; p. 6), 98 percent of the retirement plans that designated a QDIA in 2023 chose to offer a TDF.

Mitchell and Utkus (2022) studied the introduction of TDFs in a large sample of Vanguard 401(k) plans. They highlighted two advice-related features of TDFs. First, participants are likely to interpret the fact that each fund name includes a target retirement year as an implicit recommendation about how they should be investing. Second, because TDFs automatically reduce portfolio risk over time in a prespecified manner (known as the 'glide path'), TDFs relieve participants of the need to rebalance portfolios as they age. The authors found that when Vanguard TDFs were introduced into plans with voluntary enrollment, 28.4 percent of new employees and 10.2 percent of existing employees invested partially or entirely in TDFs. For plans with automatic enrollment, those statistics were 78.7 percent and 21.7 percent, respectively. The authors interpreted the fact that approximately twice as many existing employees choose to invest in TDFs in plans featuring automatic enrollment as a default-related 'endorsement effect.' With respect to portfolio characteristics, they showed that transitioning to TDFs was associated with increased equity exposure and decreased idiosyncratic risk. They acknowledged, however, that decreases in idiosyncratic risk could partly reflect the fact that Vanguard TDFs invest in index funds rather than

actively managed funds. Analyzing account-level data from a large US financial institution, Parker et al. (2023) found that the widespread adoption of TDFs, made possible by the Pension Protection Act of 2006, increased both the average allocation to equity and the extent to which equity allocations varied over the lifecycle.

Several other studies have also highlighted the benefits of TDFs. Keim and Mitchell (2018) studied participant responses to a change in the investment menu offered by a large nonprofit institution, which, in 2012, eliminated 39 funds, impacting approximately half of plan participants. Only 26 percent of the participants with funds slated for removal actively chose from among the remaining funds during the July 1 to October 19 window; the remaining 74 percent were mapped into an age-appropriate TDF. In both samples of participants, there were significant reductions in expense ratios, idiosyncratic risk, and systematic risk. Chalmers and Reuter (2020) studied a retirement plan where TDFs were added for all participants, but access to one-on-one advice from brokers was eliminated for new participants. They documented that the same participant characteristics predicting demand for brokers also predict demand for TDFs. For participants with high predicted demand for advice, TDF-based portfolios held by new participants outperformed broker-recommended portfolios held by existing participants. More generally, to the extent that less sophisticated investors now outsource their portfolio management to TDFs rather than managing portfolios on their own, one can plausibly expect to see participants making fewer investment mistakes. This is an interesting area for future research. Relatedly, Blanchett et al. (2020) found that participants invested in TDFs (or managed accounts) were much less likely than others to change their retirement portfolios during 2020Q1, when COVID-19 caused a large (temporary) drop in market indices and led to spikes in volatility.

Goldin and Reck (2020) described conditions under which researchers can recover participant preferences from choices in settings with framing effects by focusing on choices against the frame. Using data on participation decisions under AE and VE, the authors concluded that the majority of employees preferred to participate, but that, for example, those employees with the low job tenure did not. Adopting Goldin and Reck's framework, Choukhmane and de Silva (2023) used changes in default investment options within 401(k) plans to estimate the investment preferences of plan participants. Their goal was to shed new light on whether stock market non-participation is driven by preferences or frictions. They found that very few of the participants defaulted into TDFs actively chose to opt-out of stock market participation by reallocating contributions to low-risk investment options, while a significant fraction of those defaulted into money market funds actively choose to invest in equity.[15] They concluded from these patterns that, in the absence of frictions, most investors would prefer to be holding risky assets in their retirement accounts. An important implication is that, for many investors, money market funds were particularly poor choices for default investment options.

While some retirement plan participants could view TDFs from different asset management firms as perfect substitutes, in practice TDFs with the same target retirement date may pursue different investment strategies. Using data for 1994 to 2012, Balduzzi and Reuter (2019) documented significant differences in the investment strategies of TDFs offered by different mutual fund families. In particular, they found that the TDFs of families entering the market after the passage of the Pension Protection Act of 2006 exhibited higher levels of idiosyncratic risk, which they attributed to strategic risk-taking with the goal of attracting flows. The fact that different TDFs exhibited different levels of systematic and idiosyncratic risk raises the possibility

[15] Choukhmane and de Silva (2023) estimated 'a coefficient of relative risk aversion of approximately 2.03, an elasticity of intertemporal substitution of approximately 0.38, and a portfolio adjustment cost of $201' (p. 2).

of matching between the riskiness of a TDF suite and the riskiness of the firm sponsoring the retirement plan. Using cross-sectional data on a large sample of retirement plan investment menus in 2010, however, they detected little evidence of risk matching. Whether this has changed over the past 14 years is unknown.[16]

While TDFs allow participants to outsource portfolio management decisions to professionals, thereby reducing the likelihood of investment mistakes, reliance on TDFs may also have unintended consequences. Goda et al. (2019) asked whether and how federal employee behavior within the TSP changed when the default investment option for new hires was changed from a low-risk, low-return fund that invested in US Government bonds to TDFs. Their main finding was that employees were less likely to make active choices about their contribution rates when the default investment option was a TDF. Because the default contribution rate was 3 percent and the minimum contribution rate required for an employer match was 5 percent, on average, total contributions fell for new hires. A broader concern is that reliance on TDFs can reduce engagement with the retirement plan because the most important function—portfolio management—has been outsourced. Reuter and Richardson (2022) studied demand for advice within a set of retirement plans administered by TIAA-CREF, and they concluded that participants who invested solely through TDFs were significantly less likely to seek advice on both asset allocation and retirement income levels. While it is not surprising that this would be true for younger employees, it remained true throughout the age distribution, suggesting that investors in TDFs were less likely to learn whether the default savings rate was the best one for them.

[16] Choi et al. (2003) emphasized that the choice of an optimal default savings rate requires knowledge of the underlying distribution of optimal savings rates, and that extreme defaults are more likely to spur active choice. The choice of an optimal TDF is more complicated. On the one hand, it is conceivable that there is greater dispersion in optimal asset allocations than in optimal savings rates, especially as employees get older. On the other hand, given low levels of financial literacy, it is unclear that active choice in the absence of financial advice is likely to improve participant welfare (Carroll et al. 2009). As I discuss in this section, defaulting employees into TDFs may also reduce demand for financial advice (Reuter and Richardson 2022).

**Customized Defaults?**

Moving from voluntary to automatic enrollment boosts retirement plan participation rates, but it also replaces at least some active choice with one-size-fits-all defaults. Conceptually, it should be possible to reduce the gaps between employees' optimal choices and default choices by conditioning defaults on employee characteristics. While TDFs already offer different portfolios to employees with different target retirement dates, there is scope for improvement with respect to default investment options and other defaults. Goda and Manchester (2013) used a regression discontinuity design empirical strategy to study the effect of defaults on the choice of retirement plan. Their empirical setting was a firm that closed its defined benefit (DB) retirement plan to new employees, and then gave existing employees a one-time, irreversible choice between the two plan types. For employees age 45+, the default was the DB plan; for younger employees, it was the DC plan. The authors estimated that employees with ages just below 45 were around 60 percentage points more likely to enroll in the DC plan, compared to workers just over age 45 at the time of plan transition. Next, they solved for the optimal age-based cutoff between the two types of plans as one that maximized aggregate pension wealth, controlling for the greater risk of DC retirement plans. Implicit in this exercise was the possibility that DC plans could be optimal for participants who were sufficiently young, so long as they were not too risk averse. Indeed, when the coefficient of constant relative risk aversion was assumed to be two, they found that the optimal age below which to default employees into the DC plan was 47, close to the age that was chosen by the firm. When the assumed coefficient of constant relative risk aversion was increased to 10, the optimal age below which to default employees into the DC plan fell all the way to 20, implying that all existing employees should be defaulted into the DB retirement plan (and reducing the expected benefit to the firm of closing the DB plan). The authors concluded that defaults that ignore key

employee characteristics were likely to result in smaller welfare gains than those that internalized one or more of these characteristics.

It is conceivable that employers could, if permitted by the US Department of Labor (DOL), condition default savings rates on age, income, industry, expected employment tenure, and other characteristics, including whether the employee is currently making student loan payments. With respect to default investment options, plans could replace TDFs with managed accounts that internalized employee preferences, savings needs, and the level of other financial assets (if any). For example, Duarte et al. (2022) used machine learning algorithms to demonstrate that TDF-style glide paths depending only on investor age reduced expected consumption by 2-3 percent relative to allocations that incorporated investor wealth levels and macroeconomic factors. Or, under the assumption that the value of customized advice on asset allocation and savings rates increased with age, plans could offer managed accounts as defaults for employees above a particular age. The question that employers would first need to answer is whether the expected benefits of customization outweighed any increase in fees, especially if meaningful customization required detailed input from employees.

**Automatic Escalation**

As noted above, automatic enrollment is associated with decreased dispersion in employee contribution rates. In the earliest studies, default contribution rates under AE were lower than under VE because the default rates were set quite low. According to Vanguard (2024), however, the average employee contribution rate was 7.4 percent in 2023, and the median was 6.2 percent. These higher rates reflect some combination of higher default contribution rates and automatic escalation, which was encouraged by the Pension Protection Act of 2006. Under automatic escalation, plans could set a default contribution rate of 3 percent but then, if participants did not

opt out, raise the contribution rate by one percentage point each year, up to a maximum of 10 percent.[17]

Thaler and Benartzi (2004) provided the first real-world evidence that automatic escalation could be used to increase contribution rates—at least within firms actively seeking to boost contributions. They described how behavioral biases, including a lack of self-control, procrastination, and loss-aversion, could lead some workers to save too little for retirement. Then, because their paper sought to provide prescriptive savings advice, the authors tested a (trademarked) intervention named Save More Tomorrow ('SMarT'). This product set an initial contribution rate and then committed to increase the contribution rate by one or more percentage points following annual raises, with this timing chosen so that take-home pay was not reduced.

The SMarT plan was implemented differently at three firms. At the first, which they followed over four pay cycles, average contribution rates for participants joining SMarT increased from 3.5 percent to 13.6 percent, and participation rates remained high. For the entire plan, the average contribution rate increased from 4.4 percent to 10.6 percent. The implementation of SMarT at the third firm came closest to how automatic escalation is typically implemented by firms today, as it featured pre-determined contribution rate increases of one, two, or three percentage points on April 1 of each year. (In their data, 54% of participants chose one percentage point, 35% chose two percentage points, and 11% chose three percentage points.) Take-up rates were higher for those earning less than $50,000 (in 2004), but also for those with 4-5 years of tenure, suggesting that automatic escalation was most popular with employees having stable employment. Based on a simulation at the end of the paper, the authors concluded that when

[17] Vanguard (2024, p. 5) reported that 59 percent of plans featured AE in 2023, and 41 percent of plans combined AE with automatic escalation. The statistics were 50 percent and 34 percent, respectively, in 2019. By way of comparison, Arnoud et al. (2021) reported that 59 percent of plans featured AE in 2017, but only 18 percent combined AE with automatic escalation.

automatically enrolling workers in SMarT with a 5 percent baseline contribution rate and a 2 percentage-point annual increase (and allowing for attrition from the plan), 'the average saving rate is projected to increase from 5.0 percent to 10.9 percent within five years' (p. S184).

The magnitude of this simulated increase begs the question of how well automatic escalation works when applied to more diverse plans. While financial services firms are in an excellent positive to describe the evolution of plan contribution rates in plans with and without automatic escalation by participant age and income, I am unaware of any such tabulations. In a very-recent study of the long-term effects of automatic enrollment and automatic escalation (described in more detail below), Choi et al. (2024) estimated that automatic escalation increased contribution rates by 0.2 percent of income per year, with fewer than half of participants accepting automatic escalation on their first escalation date.[18]

**Expanding Access to Retirement Savings: The UK Experience**

The 2008 UK Pensions Act extended AE to most private sector employees, beginning in 2012. An initial assessment of the regulation by Cribb and Emmerson (2020) found that only 36 percent of private sector employees were active participants in an employer-sponsored retirement plan in 2012. Thereafter, AE was rolled out in waves, between 2012 and 2017, beginning with the very largest employers.[19] The set of 'targeted' employees included those of working age with annual earnings above a minimum threshold (£10,000 in 2014). Until April 2018, the minimum employee contribution was 1 percent and the minimum employee plus employer contribution was 2 percent. In April 2018, the minimum contribution rates increased to 3 percent and 5 percent, and

[18] Zhong (2021) used participant reactions to automatic escalation in OregonSaves to estimate that the optimal contribution rate for that population was 7 percent.
[19] To prevent manipulation of enrollment dates, size was determined by the number of employees in 2012

in April 2019, increased again to 5 percent and 8 percent. Employees who opted out of the program forwent the employer contributions.

Exploiting a difference-in-difference empirical strategy, Cribb and Emmerson (2020) estimated that this policy increased private sector participation rates by 36 percentage points (relative to a baseline of 49% for the large and medium-size employers studied). Furthermore, they estimated even larger effects for lowest-quartile earners (54 percentage points) than for highest-quartile earners (16 percentage points). The combined employee plus employer contribution rate was estimated to rise by 1.1 percent of earnings (including the 0% contribution rates of those who opted out). Interestingly, they also found modest increases in participation by employees who were not targeted by the program (e.g., based on age or income) but nevertheless eligible to participate.

In a later paper, Cribb and Emmerson (2021) studied the short-term effect of AE on small employers, which had the lowest participation rates in 2012. The authors' empirical strategy exploited randomization in enrollment dates of employers with between 2 and 29 employees. There were several reasons to expect that automatic enrollment would be less successful in smaller firms. In particular, these firms pay lower wages and have higher turnover rates. Moreover, because they disproportionately lack retirement benefits, these firms may attract employees with higher discount rates. As a result, it was unclear whether smaller employers would view the introduction of an automatic enrollment retirement plan as a positive development. Nevertheless, the authors concluded that participation rates at small employers increased by 44 percentage points, resulting in an overall participation rate of 70 percent. The largest effects were for employees below the age of 40 (54% versus 36%) and with fewer than four years of tenure (49% versus 40%). Total contributions increased by 1.8 percent of earnings, a bigger increase than for the larger firms studied in their earlier paper. Given their empirical strategy and data, however, the

authors were unable to measure long-term effects on participation rates or retirement account balances, or to test for crowd-out among different forms of savings.

**Expanding Access to Retirement Savings: The US Experience**

Many US employees still lack access to employer-sponsored retirement plans, especially lower-wage workers at smaller firms. According to the US Bureau of Labor Statistics (USBLS 2021), 64 percent of private sector workers in the US had access to employer-sponsored DC retirement plans in April 2020. Access was higher for employees of larger employers (78% of those with 100+ employees versus 53% of those with 1-99 employees), and for employees earning higher wages (84% in the top quartile of wages versus 41% in the bottom quartile). Moreover, while employees lacking access to employer-based retirement plans could open and contribute to individual retirement accounts (IRAs), very few do so (e.g., Chalmers et al. 2022).

In response to low levels of retirement savings by lower-income US households there have been legislative movements at the state and federal levels to greatly expand access to employer-based retirement plans (Degen 2024). In 2017, Oregon introduced the first state-sponsored automatic-enrollment retirement plan, requiring employers not already offering a retirement plan to automatically enroll their employees in OregonSaves. As in the UK, the program was launched in waves, beginning with the largest employers. Following a brief enrollment period, during which employees could opt out of the program, Oregon opened (after-tax) Roth IRAs on behalf eligible employees. The default contribution rate was 5 percent of before-tax income and, unless the employee opted out of the automatic escalation provision, rose by one percentage point per year to a maximum of 10 percent. There was no employer match, but because employees contributed

to Roth IRAs, employees could withdraw contributions without tax penalties, resulting in liquid retirement savings.[20]

According to the Center for Retirement Initiatives, 16 states have introduced automatic-enrollment IRA programs (Georgetown University 2024), and as of March 31, 2024, there was $1.38 billion invested in automatic IRAs in California, Colorado, Connecticut, Illinois, Maryland, and Oregon. In Oregon alone, 126,234 accounts held $273.1 million, for an average account balance of $2,163 (OregonSaves 2024). Consistent with the large number of funded accounts in Oregon, Dao (2024) showed that OregonSaves boosted IRA ownership among employees without access to 401(k) plans by 2.8 percentage points (or 27 percent).

Quinby et al. (2020), Chalmers et al. (2022), and Chalmers et al. (2024) all relied on administrative data ending in 2019 or 2020 to provide initial assessments of OregonSaves. All three studies emphasized that OregonSaves targeted employees in low-wage jobs and industries, where participation rates are much lower than observed in private sector 401(k) plans with automatic enrollment. For example, taking a calendar-time perspective, Quinby et al. (2020) found that, among those employees classified as actively employed, 43 percent had a positive contribution rate and a positive account balance. By way of comparison, for employees earning between $15,000 and $30,000, Vanguard (2024) reported participation rates of 44 percent under voluntary enrollment and 87 percent under automatic enrollment.

Taking an event-time perspective, Chalmers et al. (2024) showed that after 12 months, 50 percent of participants had opted out, 37 percent had experienced job turnover, and 69 percent

[20] From 2017 to late 2021, the first $1,000 in contributions were invested in a money market fund and all additional contributions were defaulted into an age-specific TDF. In other words, the program effectively combined safe liquid savings with risky retirement savings. (MarylandSaves, for example, still has this structure.) OregonSaves now transfers all money market assets to an age-specific TDF after an initial waiting period; while employees can still withdrawal their contribution without tax penalties, their account balances are exposed to market risk.

have either opted out or experienced job turnover, though there were meaningful differences across industries. High turnover rates pose serious challenges for employees seeking to save, as well as those seeking to measure participation rates.[21] Chalmers et al. (2024) found modestly higher opt-out rates in industries with higher average incomes. At the same time, the authors found that employees with lower earnings within their industry (and within their employer) were more likely to quickly stop contributing. Chalmers et al. (2022) reported that the number one reason that employees gave for opting out of OregonSaves was a lack of income.

These authors also tracked the evolution of account balances in event time for the subset of contributors that could be followed for at least 12 months (Chalmers et al. 2024). Including the 10 percent of accounts that end the 12-month period with a $0 balance—but ignoring employees that never contributed—the mean account balance was $699, and the median was $348. These amounts are small by the standards of retirement accounts, but large by the standards of liquid saving accounts. Because their administrative data end in April 2020, the authors could not track inflows or outflows during the pandemic, to learn whether participants tapped into the liquid savings. Quinby et al. (2020) reported that 20 percent of accounts with a positive balance during September 2018 experience at least one withdrawal over the next 12 months, and the withdrawal rate was highest for those that stopped working for an employer participating in OregonSaves. It is still now known if employees viewed their OregonSaves accounts as a source of liquid savings, to smooth consumption between jobs, or if they simply closed their accounts because they did not wish to contribute into OregonSaves again.

In the future, it will be interesting to see how participation rates and account balances in

[21] Crowney (2002) wrote that '[m]ost experts believe that turnover, a chronic problem in the fast-food business, was the reason McDonald's threw up its hands on automatic enrollment [in 2002].'

OregonSaves compare to those in CalSavers and other state-sponsored automatic IRAs?[22] One puzzling feature of the OregonSaves program is the large number of employers who enrolled employees but never directed contributions to their Roth IRAs. For example, in March 2024, 27,745 employers had uploaded employee data but only 7,514 had submitted payroll during the past 90 days (OregonSaves 2024). Because OregonSaves had not yet imposed fines on employers for non-compliance, it is unclear how many employers could be waiting for penalties to be imposed before beginning to comply (or applying for exemptions from the program). In California, employers can face penalties of up to $500 per employee for non-compliance (CalSavers Retirement Savings Program 2024).

**How Do Households Finance Savings from Automatic Enrollment?**

To the extent that automatic enrollment and automatic escalation are intended to move employees closer to their optimal saving rates, there is an implicit assumption that employees will reduce consumption to accommodate the additional savings. Yet, there also may be offsetting decreases in other savings, or even increases in debt. A particularly concerning scenario would arise if low-income employees effectively financed retirement savings by taking on payday loans. Unfortunately, data on the behavior of retirement plan participants rarely can be linked to information on checking accounts, liquid savings accounts, other retirement accounts (if any), credit card balances, and other forms of debt. There are three notable exceptions.

Beshears et al (2022) were the first to ask whether increased savings through automatic enrollment was financed through increased household debt, resulting in higher measured financial distress. In August 2010, newly hired civilian employees of the US Army were automatically enrolled in the TSP at a default contribution rate of 3 percent; those hired before that date were

[22] A search for 'CalSavers' on SSRN.com returned four articles related to the legality of automatic IRAs and no articles on participation rates or asset accumulation.

still subject to voluntary enrollment. (The researchers observed contributions to the TSP, but not withdrawals; this was the same plan change studied by Goda et al. 2020.) To measure changes in debt, they linked employee payroll records to credit bureau reports. They found little evidence that credit scores or debt balances (excluding auto loans and first mortgages) changed in response to automatic enrollment, even when focusing on employees earning under $34,000.

Scenarios in which employees finance savings through borrowing seem more likely to arise when retirement savings plans are extended to jobs with lower wages and less stable employment. To study this possibility, Choukhmane and Palmer (2024) exploited the increases in UK minimum contribution rates that took place in April 2018 and April 2019 (described above). To determine how employees responded to changes in both their contribution amounts and employer matches, they analyzed panel data from a large UK financial institution that merged retail deposit and credit account data with pension account data. The authors' empirical strategy made use of the fact that some employee and employer contributions needed to be adjusted because of the regulation, while others (already above the required minimums) did not. They found that only one-third of the decrease in monthly take-home home was financed through decreased consumption; the rest was financed through lower deposit account balances and higher credit card balances.[23] Furthermore, the changes in consumption were concentrated in discretionary non-durable spending, including restaurants and leisure. Consistent with liquidity constraints, they also found that households with the lowest pre-existing deposit balances and the highest pre-existing credit card balances reduced their consumption the most.

[23] Specifically, Choukhmane and Palmer (2024) found that a £1 increase in total (employee plus employer) pension contributions was associated with a £0.67 decrease in monthly take-home pay and a £0.23 decrease in total spending, where £0.23 is approximately one-third of £0.67.

Beshears et al. (2024a) also asked whether increases in retirement plan contributions in the UK were offset on other margins. Like Cribb and Emmerson (2021), their empirical strategy was based on randomized enrollment dates for employers with 2-29 employees during the initial rollout, when the minimum combined contribution rate rose from 0 percent to 2 percent. The authors combined individual-level data from the National Employee Savings Trust (Nest) with individual-level credit bureau data from Experian and employer-level data on enrollment dates.[24] The (treatment-on-treated) estimates compared pension contributions and outcomes of those enrolled earlier relative to those enrolled later, over a three-year period. Among contributors, they found an additional month of enrollment increased employee contributions by £16-£19, but also increased unsecured debt by £7. (Accounting for employee contributions, employer contributions, and tax credits, an additional month of enrollment increased total pension contributions by £32-£38.) The authors reported that the increase in unsecured debt was higher for younger and lower-paid employees, as well as those with higher credit scores. They concluded that 'automatic enrollment has complex effects across different facets of the household balance sheet' (p. 24).

**What are the Long-Term Effects of Automatic Enrollment?**

In January 2020, David Laibson gave a presentation to members of the American Economic Association and American Finance Association titled 'Nudges are Not Enough,' in which he argued that the long-term effects of nudges like AE were generally smaller than the short-term effects. His insight was that, while large welfare effects depend on cumulative effects over long horizons, the effects of nudges often can be undone, and that this was especially likely to occur when nudges sought to overcome long-standing worker preferences or biases.[25]

[24] Nest was created as a public option, with a mandate to serve all eligible firms, but it has several private sector competitors (Ladimeji 2024).

[25] When Laibson considered the nudge literature more broadly, the only example he cited of a nudge with a large short-term effect and plausibly large welfare effect was Bettinger et al. (2012), who showed that simplifying college financial

Three recent papers report that the short-run effects of automatic enrollment on retirement savings overstate the long-run effects. In one, Choukhmane (2024) analyzed data from the US and UK. Using data on over 100 US 401(k) plans with a variety of default contribution rates, he found that AE boosted contribution rates initially, but that after three years of tenure, average cumulative contributions of non-automatically enrolled employees converged to those of automatically enrolled employees. Convergence occurred because automatically enrolled workers were more likely to remain at the default contribution rate, while voluntarily enrolled workers were more likely to increase their contribution rates over time. When comparing average contribution rates, however, it is important to recall that AE simultaneously increases contribution rates for employees who would not have contributed under VE and decreases the contribution rates for (some) employees who would have contributed under VE. Consequently, Choukhmane found that AE increased the savings of workers at the bottom of the savings distribution, who would not otherwise have benefited from employer matching contributions. The same study exploited the phased rollout of automatic enrollment by employer size in the UK (described above) and found that workers automatically enrolled at their prior employer were less likely to voluntarily enroll at their new (smaller) employer. This finding highlighted a limitation of behavioral nudges. The practical implications of this finding in the UK are unclear, however, because he found no difference in the likelihood of opting out if the new employer also offered automatic enrollment (now the norm).

Derby et al. (2023) used US tax data covering 745 firms to study the responses of employees and their spouses to automatic enrollment. While the authors found that AE increased

aid applications increased applications to and enrollment in college. More generally, we should expect the largest welfare effects when nudges involve choices which are difficult to undo. See, for example, my discussion of Goda and Manchester (2013)'s analysis of age-based defaults into DC or DB retirement plans, which was an irreversible choice.

retirement plan contributions by 1.28 percent points (a 51% increase) during the first year, the net increase at the end of the year was only 1.02 percentage points because employees subject to AE were significantly more likely to withdraw contributions following job turnover. Four years after enrollment, the net increase in savings had fallen to 0.73 percentage points. The authors did not find any evidence that spouses adjusted their retirement savings behavior in response to AE, which they attributed to the fact that savers under AE are not active savers.

Finally, Choi et al. (2024) compared the behavior of new and existing employees at nine firms that made changes to the structure of their 401(k) plans that only impacted new employees. There were three types of changes: the introduction of AE without default automatic escalation, the addition of default automatic escalation to plans that already featured AE, and the simultaneous introduction of AE and default automatic escalation. After accounting for plan withdrawals following job turnover, and removing variation due to differences in investment returns, the authors estimated that, over 60 months, AE increases annualized savings by 0.6 percent of income, automatic escalation increased annualized savings by 0.2 percent of income, and that the introduction of both features boosted annualized savings by 0.8 percent of income.

These estimates were lower than earlier estimates for three reasons. First, as in Choukhmane (2023), existing employees were more likely to increase savings rates on their own. Second, while the likelihood that withdrawals were reinvested in another retirement plan were similar for new and existing employees, new employees were more likely to experience leakage because they were more likely to experience job turnover. Third, while many employees did not initially opt out of automatic escalation, only 39 percent of employees subject to automatic escalation allowed their savings rate to increase on the first escalation date. The conclusion of all three paper is that nudges in 401(k) plans increased savings, but by less than policymakers might

have hoped. It is important for future research to ask how these effects vary with employee characteristics such as income and expected job tenure, and whether there are groups of employees for whom increased savings are entirely offset by increased debt.

**Employer-Based Liquid Savings Accounts?**

Although many lifecycle models focus on a single portfolio, real-world savers need to decide how much to save in relatively illiquid retirement accounts, versus in liquid savings accounts. The evidence suggests that, in practice, many households fail to accumulate much in the way of liquid savings. Canilang et al. (2020) reported that 16 percent of US households stated they were unable to pay all of their monthly bills, and another 12 percent stated that they would be unable to do so if confronted with an unexpected expense of $400. Given this evidence of financial fragility, there has been growing interest in bundling liquid savings accounts with traditional employer-sponsored retirement accounts.

In an analysis of the 2019 Survey of Consumer Finances (SCF), Berk et al. (2023a) confirmed that 25 percent of US households of all ages lacked emergency savings, and pointed out that these patterns were consistent with present-biased preferences (Laibson 1997). The authors also established that these broad patterns held in the UK, where 34 percent of those surveyed reported non-pension savings less than £250 (but yet there was a strong positive correlation between income and levels of liquid savings). So, how did UK workers respond to the introduction of employer-based liquid savings accounts, for which they needed to sign up? Across five UK employers that began to offer these accounts, the authors found that less than 1 percent of eligible employees ever activated a savings account.

In contrast, when Berk et al. (2023b) studied the introduction of employer-based liquid savings accounts with automatic enrollment, they found much high participation rates. For

example, SUEZ Recycling and Recovery UK LTD automatically enrolled new employees in a liquid savings plan with a default contribution rate of £40 per month. In a departure from automatic enrollment norms in the US and UK, SUEZ was required to receive consent from each new hire to complete the automatic enrollment. Employees were also given multiple opportunities to opt out. By month 18, 44.5 percent of new employees were participating in the liquid savings account versus 1.3 percent of existing employees (who had to opt in). Notably, because the authors did not find that contributions to the retirement account decreased when contributions to the liquid savings plan began, total net savings rose by approximately 1 percentage point for the new hires.

**Distortions in Plan Design and Provision?**

Employees described in economics models are assumed to maximize their expected lifetime utility (e.g., Horneff et al. 2023). Given this objective, many employees would prefer their employers to offer a menu of low-cost investment options (conditional on investment style and quality), to pay all plan expenses, and to provide generous matching contributions. Of course, the generosity of the retirement plan—and whether one is offered at all—is determined by the competitiveness of the labor market.

From the employer's perspective, offering a traditional 401(k) plan is costly even when the employer shares plan expenses with employees and offers a limited employer match. The employer must hire a recordkeeper for the plan, oversee the creation of an investment menu, and periodically review the appropriateness of the investment options.[26] In practice, firms that provide recordkeeping services tend to be asset management firms. Pool et al. (2016) tested for potential conflicts of interest between employers and mutual fund families that serve as plan recordkeepers,

[26] Gropper (2024) argued that plan sponsors responded to growing litigation risk by excluding riskier options from 401(k) plan investment menus and, provocatively, that the reduced availability of riskier options was associated with lower plan portfolio returns and account balances.

using data for 1988-2009. They documented increases in the fraction of plans with mutual fund family recordkeepers (creating a potential conflict) but also in the number of mutual fund families represented on the typical investment menu (reducing the size of any such conflict). The movement towards open architecture investment menus resulted in many funds being available from both affiliated and unaffiliated recordkeepers. The authors found that the lowest-performing funds over a three-year period were about half as likely to be removed from the menus of affiliated recordkeepers over the next year as they were from the menus of other recordkeepers (13.7% versus 25.5%). Moreover, consistent with earlier evidence on plan participant inertia, 'we show that participants are generally not sensitive to poor performance and do not undo the menu's bias toward affiliated families' (p. 1781). More recently, however, Kronlund et al. (2021) found that participants responded to a 2012 DOL change in the disclosure of investment option fees and performance by withdrawing money from the most expensive funds, and that there were stronger effects in plans with larger average contribution amounts and smaller investment menus. Perhaps unintentionally, the change in disclosure also increased the sensitivity of participant flows to funds' one-year returns.

With respect to plan expenses, employers must decide what fraction of plan fees should be paid by participants, whether to offer employer matches, and whether to choose funds that provide 'revenue sharing' back to the plan. This revenue can be used to cover plan expenses or rebated back to participants. Pool et al. (2022) reported that funds paying revenue sharing were more likely to be added and less likely to be removed from retirement plans that receive indirect compensation from revenue sharing, and that 'participants face higher all-in fees.' It is unclear, however, whether the higher all-in fees reflect conflict of interests or conscious decisions by employers to make participants pay a greater fraction of plan costs.

Bhattacharya and Illanes (2022) evaluated how market imperfections and misalignment in employers' willingness to pay for quality could distort the investment menus provided to workers and lead some employers not to offer plans. On the one hand, offering higher-quality 401(k) plans could help with employee hiring and retention, and potentially reduce litigation risk under the Employee Retirement Income Security Act of 1974 (ERISA). On the other hand, employees might not value the time and expense required to offer a high-quality plan (or any plan at all), and employers are likely to possess limited budgets to pay for plan expenses. Analyzing data on all DC plans with at least 100 participants in 2016, Bhattacharya and Illanes (2022) estimated that large employers preferred for their plans to include an S&P 500 index option and TDFs, and to charge lower expense ratios, when compared to smaller employers. The authors could not identify, however, whether these preferences arose from differences in worker demand, differences in competitive pressures from the labor market, or differences in litigation risk. The authors also found that, while both large and small firms preferred that plan expenses were paid with indirect compensation, rather than direct compensation, small firm exhibited the stronger preference for indirect compensation (e.g., by offering investment options with revenue sharing). The provocative implication for those seeking to expand access to employer-based retirement plans was that 'many small firms must be able to offer low-quality plans in order to provide them at all' (p. 37). Although there was no discussion of how employer willingness to pay varied across industries, it could be lowest in those industries currently providing the least access to employer sponsored retirement plans (e.g., agriculture and food services).

After discussing several possible regulatory interventions, those authors conclude that 'regulation must directly target quality itself, either by constraining the design of plans or by subsidizing or penalizing certain plan features, if it is to be effective at improving quality' (p. 40).

The automatic IRA programs discussed above offer one standardized product which may be lower cost for employers. One interpretation of the relatively high opt-out rate in OregonSaves is that those employers that previously chose not to offer their own retirement plans were internalizing relatively low demand from their employees.

All else equal, participants benefit from lower fees. For example, participants typically benefit when plans switch to lower cost share classes of existing funds.[27] The situation becomes more complicated when higher fees are associated with more or higher-quality services. Loseto (2023) and Yang (2023) both documented significant cross-plan dispersion in the level of fees paid by 401(k) participants, but they used different models to rationalize the dispersion.[28] Loseto found that employers were only half as sensitive to fund fees as investors and tended to offer funds affiliated with their recordkeepers. Concluding that fee dispersion was driven by markups, he advocated for low-cost default investments. In contrast, Yang (2023) concluded that markups could explain only about one-quarter of the cross-plan dispersion in fees, and that the remaining dispersion could be attributed to differences in the provision of costly administrative and advisory services. As indirect evidence that recordkeeping services were not 'pure commodities,' he cited survey evidence that plan sponsors ranked 'participant readiness for retirement, plan sponsor website or tools, and participant experience' as higher priorities, on average, than the levels of recordkeeping fees and investment fees (p. 9).

**Regulatory Changes to US Savings Plans**

The US recently passed two major pieces of legislation focused on retirement savings, with SECURE Act 1.0 of 2019 and SECURE Act 2.0 of 2022.[29] Below, I describe several interesting

[27] Exceptions can arise when the share class with the higher expense ratio also pays higher revenue sharing.
[28] Both papers use newly available retirement plan-level data from BrightScope Beacon.
[29] SECURE is short for "Setting Every Community Up for Retirement Enhancement."

provisions from each act, offer predictions on likely outcomes based on existing research, and highlight where additional research is needed.

- Section 102 of SECURE 1.0 increased the maximum possible contribution rate under automatic escalation from 10 percent to 15 percent, beginning in 2020. Some employees may accept rising contribution rates, especially if increases in contribution rates coincide with higher salaries (as in Thaler and Benartzi 2004), but rising contribution rates could also trigger active choices about contribution rates, opting out from automatic escalation, or opting out from the plan (as in Beshears et al. 2023, Choi et al. 2024, and Zhong 2021, respectively).
- Section 203 of SECURE 1.0 required retirement plans 'to include two lifetime income illustrations on participants' pension benefit statement at least once every 12 months,' under a set of assumptions defined by the US DOL (2020). Specifically, the retirement plan must state the current account balance and convert this balance into both single-life and joint-life annuity payments using the prevailing 10-year Treasury rate and assuming that the participant is age 67. I am unaware of research on how this requirement has affected contribution rates. To the extent that the annuitized monthly incomes prove to be lower than employees expect, the rule could plausibly result in higher contribution rates. Relatedly, Goda et al. (2014) ran a field experiment to study the effect of providing retirement income projections on employee contribution rates in supplemental retirement plans. They reported that treatment groups were approximately 1 percentage point more likely to make any changes in contribution rates than the control group, and that the treatment groups increased annual contributions by $85 relative to the control group (which was equal to 3.6% of the average contribution amount and 0.15% of the average salary).

More provocatively, they found that changes in contribution amounts responded to the underlying assumptions in the income projections, which they randomized. It would be interesting to compare the assumptions in Goda et al.'s (2014) field experiment to the assumptions adopted by the DOL.

Many of the provisions in SECURE 2.0 were intended to increase participation and savings rates:

- Section 101 of SECURE 2.0 required all *new* 401(k) and 403(b) plans to feature automatic enrollment and automatic escalation, with an initial contribution rate of at least 3 percent and a maximum contribution rate of at least 10 percent. This provision will eventually increase the set of retirement plans offering automatic enrollment, but the initial impact is likely to be small because existing plans are not required to do so.
- Section 110 of SECURE 2.0 allowed (but did not require) employers to treat student loan payments as employee retirement contributions from the perspective of employer matching contributions, beginning in 2024. It will be interesting to see what fraction of plans adopt this feature and how it impacts retirement savings for the large fraction of young employees with college debt. Holding employee college debt repayment strategies constant, retirement savings could rise due to the new employer matches, increasing the costs associated with offering the retirement plan, except insofar as the provision helps with recruiting and retention. Allowing for optimal responses, as modeled by Horneff et al. (2024), it is likely that net employee retirement contributions by younger employees will actually decline (because they are no longer required in order to qualify for the employer match), resulting in increased consumption rather than increased savings.
- Section 103 of SECURE 2.0 replaced a non-refundable 'Saver's Tax Credit' with a 'Saver's Match,' beginning in 2027. The previous approach allowed lower-income

households to reduce their taxes by up to $1,000 (single) or $2,000 (married), while the new approach will deposit up to 50 percent of the first $2,000 contributed to eligible retirement accounts directly into those accounts (eligibility for the match will still depend on household income). Ramnath (2013) showed that households adjusted their income to preserve the value of the Saver's Tax Credit, but that the higher credit rate did not boost individual savings contributions at the margin. It remains to be seen whether the Saver's Match proves more effective in increasing retirement savings than the Saver's Tax Credit. Notably, because Roth IRAs will not be eligible for Saver's Match contributions, state-sponsored plans like OregonSaves would need to create companion traditional IRAs in order for participants to receive Saver's Match contributions.

- Section 113 of SECURE 2.0 allowed employers to offer employees small financial incentives to participate in their retirement plans. It will be interesting to see whether these incentives can meaningfully increase participation rates in plans featuring voluntary enrollment.
- Section 121 of SECURE 2.0 allowed employers to offer 'starter 401(k) plans,' which can set a default employee contribution rate between 3 percent and 15 percent and need not offer any employer match. Unlike traditional 401(k) plans, the annual employee contribution limits are the same as for IRAs. My prediction, based on the estimates in Bhattacharya and Illanes (2022), is that take-up of these plans will be quite low, except to the extent that they allow employers to comply with automatic IRA mandates.

With respect to emergency savings:

- Section 115 of SECURE 2.0 allowed plan participants to withdraw up to $1,000 per year to cover emergency expenses. It is unclear whether this option is intended to replace small

401(k) loans, or to extend the possibility of small 401(k) loans to more plans. While the need to repay 401(k) plan loans plausibly could crowd out elective plan contributions, Beshears et al. (2024b) find that participants in Vanguard plans only slightly reduced their contributions when repaying loans.

- Section 127 of SECURE 2.0 went further, allowing employers to offer the type of automatic-enrollment emergency savings accounts in the UK studied by Berk et al. (2023b). Because the accounts must be structured like Roth IRAs, with a maximum contribution rate of 3 percent, and maximum employee contributions of $2,500, it is an open question whether participation rates will be as high in the US as they were in the UK. It is also an open question whether employers will benefit from lower absenteeism and turnover rates when their employees gain liquid emergency savings.

In February, US Representative Richard Neal introduced the Automatic IRA Act of 2024, which would expand the automatic enrollment mandate underlying the existing state-sponsored plans to all fifty states, increasing plan portability (Degen 2024). Given the resistance by some politicians to mandates, there also has been bipartisan work on a bill that would allow workers to voluntarily enroll in a government-sponsored plan like the TSP. In either case, it will be important to study the effects of expanded access on retirement savings behavior.

**Conclusion**

DC retirement plans have come a long way since the Employee Retirement Income Security Act of 1974, and they continue to evolve. Widespread acceptance of automatic enrollment, automatic escalation, and sensible default investment options allow workers to outsource retirement plan participation decisions, savings rates, and asset allocation decisions to their employers, simultaneously increasing savings and (likely) decreasing the extent to which

participants make common investment mistakes. The potential downside, as has been emphasized at the outset, is a reliance on one-size-fits-all solutions to complex optimization problems that depend on a wide range of household characteristics and preferences. The optimal plan design is one that can encourage active choice along those dimensions about which the employees are best able to make decisions, but which otherwise relies on defaults.

I conclude the chapter by listing several open research questions. Goda and Manchester (2013) emphasized that welfare gains from defaults will depend on employee characteristics. To what extent should default saving rates and asset allocation decisions vary with income, industry, job type, age, household structure, and part-time versus full-time employment status? For example, should efforts to expand access to automatic IRAs exempt certain industries or job types? Should these plans force active choices instead of relying on automatic enrollment? With respect to default asset allocations, should retirement plans transition from TDFs that condition portfolio choices only on participant age to managed accounts that condition on a broader set of participant characteristics, to better capture heterogeneity in their financial circumstances and risk preferences? If so, when do the potential benefits of customization outweigh any additional portfolio management fees and administrative costs? More generally, even if there are strong economic arguments for transitioning to customized defaults, doing so may raise issues of fairness. Exempting the lowest income workers from automatic enrollment or defaulting them into a retirement plan at a lower default savings rate may make sense given their financial constraints, but doing so is likely to increase wealth inequality. Finally, does the rise of AE have implications for the choice of non-default investment options, by reducing the likelihood that unsophisticated participants use these options to construct their own portfolios? Questions such as these require answers if policy makers are to move ahead regulating plan design.

As researchers continue to combine data on household assets and liabilities, we should gain an even deeper understanding of the various ways that households respond to automatic enrollment. This is particularly important when studying programs like OregonSaves that extend retirement savings to jobs that feature low wages and high turnover rates. Given the potential concerns about crowd out, should automatic IRAs continue to emphasize their dual role as retirement savings and liquid savings? More broadly, will the extension of automatic enrollment to liquid savings increase the fraction of households with meaningful buffer stocks? Finally, while the research that I have discussed focuses on asset accumulation, decisions focused on asset decumulation are at least as difficult as those focused on asset accumulation. Default investment options structured to provide annuity income—such as those introduced by TIAA in 2023 and recently announced by Blackrock—are one potentially valuable development in this area. Horneff et al. (2023) made an important contribution by studying when retirees benefit from using DC assets to purchase annuity income, versus using them to delay the claiming of social security benefits, but more research on optimal decumulation is needed.

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