

Defined contribution retirement plan design and the role of the employer default

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1. Introduction

An important feature of most current employer 401(k) and 403(b) retirement plans is the presence of a “default” provision, which specifies the asset allocation for employees who are not proactive in selecting an explicit allocation.¹ The default provision assigns the same default asset allocation to all employees in a relevant class, such as the same age, who do not directly designate their own asset allocation.² Many individuals do not appreciate the nature of risk-bearing and consequently, find it challenging to determine or to implement an asset allocation. The presence of a default option finesses aspects of this challenge by implementing an asset allocation for the employee’s retirement plan assets without requiring explicit decisions by the employee. Instead, an employee can utilize the default portfolio chosen on his behalf by the employer. This would be very useful when the employee recognizes the limitations of his own skill relative to that of his employer.

For some employees, the costs of choosing or implementing the individual’s portfolio can loom very large and therefore, the use of a default portfolio (without any personal costs) can be optimal. But at the same time, there are a number of disadvantages of using a default portfolio, as the portfolio does not reflect the individual’s preferences,

¹ The default portfolio construct is not specific to defined contribution plans in the United States and instead arises in many countries.

² One could imagine an alternative type of default portfolio that would be dependent upon the split of the individual’s taxable and tax-deferred wealth, provided that the employer had access to this information and could implement that. In contrast, the investor’s age is directly in the employer’s information set, so that facilitates conditioning the default allocation upon the investor’s age.

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such as risk aversion and intertemporal preferences, as well as his characteristics, such as his sophistication, financial wealth, human capital, the mix between taxable and tax-deferred funds, and perhaps even the individual's age. Furthermore, the presence of a default portfolio would encourage use of it (compared to individual allocation decisions) and inhibit the extent to which the employee improves his investment decision-making expertise, rather than learning to sort through the relevant risk-sharing issues. The official sanctioning by the employer of the default portfolio and the manner in which it substitutes for the individual's choice undercuts the incentive for the employee to develop expertise on lifelong financial security. In this sense, the presence of a default portfolio (and especially a more suitable default portfolio) is a barrier to customizing the portfolio and to learning by the investor. While for some employees there is a substantial direct benefit to the use of a default portfolio, for others, the default portfolio can have adverse indirect effects. The default portfolios in retirement plans have shifted away from cash or money market funds to explicitly risky asset allocations, such as a target-date fund (mix of risky and riskless assets) designed for the investor's age by an asset manager or the employer.³ The risk allocation in such target-date funds, as well as other default asset allocations chosen by employers tends to decline with the investor's age. The change in the underlying default allocation from a riskless investment (such as money market funds or cash) to a risky investment (such as a target-date fund) reflects a desire by the employer to reduce the costs to employee investors of not bearing any exposure to risk. Of course, the extent to which the employer possesses relevant expertise for determining this is ambiguous.⁴

Indeed, an important challenge confronting employees is to build their expertise in asset allocation and financial management. The presence of a default allocation, especially one that seems credible, can discourage investors from developing this crucial expertise. Yet the development of this skill is essential for many participants given the importance of the funds to most plan participants and the heterogeneity in views about asset allocation among these participants (so one cannot rely upon the default portfolio). Of course, improvements in the default allocation, which increase its desirability, will reduce the frequency at which employees enhance their expertise and decision making about asset allocation within the tax-deferred account.⁵ In effect, a more desirable default allocation serves as a substitute for an increase in employee efforts and sophistication. This is an important consideration that has received insufficient attention in discussion about the use of a default allocation and the actual default allocation. This suggests a sense in which there can be important "unintended consequences" associated with the use of a default portfolio or improvements in the attractiveness of the default for most investors.

Along related lines, it is worth noting that the presence of a default portfolio in the tax-deferred account can decrease as well as increase the incentive to contribute to the tax-deferred program. The plan design influences the participant decisions and reflects how these plans have evolved over time. An interesting illustrative example of the former in a different setting is provided by Choi, Laibson, Madrian and Metrick (2004), who document that automatic enrollment at a base contribution level actually *reduces* the contributions of

³ Spatt (2017) interprets target-date funds as providing a basis that spans potential risk allocations. Furthermore, Spatt (2017) also shows that the Capital Asset Pricing Model (CAPM) is equivalent to target-date funds being on the mean—standard deviation frontier. This provides an underlying foundation for the use of target-date funds that does not require that the investor optimally purchases the target-date fund designed for the investor's specific age. This strengthens the foundation for the target-date fund as it does not require that the designer chooses the target date-fund optimally.

⁴ However, it is not an unreasonable presumption that an employer would possess greater expertise than many of the employees interested in a default portfolio, even if they do not possess greater expertise than their more sophisticated employees or even their average employee. Those employees who possess limited expertise are likely to presume greater sophistication of his employer and are most likely to rely upon the employer.

⁵ The optimal investment of funds in tax-deferred accounts in the presence of taxable investing is explored in the context of asset location (what to invest in taxable vs. tax-deferred accounts). The foundation of optimal asset location is developed in Dammon, Spatt and Zhang (2004) and the implications for asset location are discussed in Dammon, Poterba, Spatt and Zhang (2005).

many participants.⁶ For example, some participants respond to the positive base (default) contribution as suggesting that level provides an adequate or almost adequate level of retirement plan funding and so contribute that amount (or a modestly higher level) rather than a substantially higher one that they would have otherwise undertaken. This illustrates the motivation for our focus upon the role of the employer's default baseline in the plan and why it can lead to distortions—and in this instance, even a possible decline in employee savings. Of course, it also can encourage higher savings by those whose savings would otherwise have been lower. Many default plans have modest pretax savings rates and indeed, there is potential debate about the impact of higher rates on savings (including whether it would discourage low-income individuals from contributing and also potentially impact wages).

2. Default vs. individual asset allocation: A basic perspective

While investors are heterogeneous in their risk preferences and desired portfolio allocation, there is a broader recognition that owning only riskless assets is not optimal for many (or perhaps any) investors. Some of this view reflects the substantial historical realized returns on equity, suggesting that realized equity returns have exceeded the returns implied by relatively simple frictionless models of the risk premium. The optimality of positive equity holding by (all) investors can be rationalized by a number of model frameworks. First, consider a risk-averse investor solving a portfolio problem with a riskless asset and a single risky asset (portfolio). As long as the expected return on the risky asset exceeds the risk-free rate, the optimal holding of the risky asset is positive. This arises because the risk-averse investor is risk-neutral for holdings of the

risky asset near zero (and so would hold optimally at least some risk, since the risky asset offers a higher expected return). An alternative perspective that points to the optimality of positive holdings of the risky asset is that as long as the aggregate supply of the risky asset is positive, then optimal risk sharing suggests that in equilibrium all investors should hold positive amounts of it.⁷ Since the conclusion that the optimal allocation of risky assets is positive for all investors, the optimal default investment portfolio should involve holding a positive amount of the risky asset, rather than owning only the risk-free asset. In effect, this provides a theoretical foundation for the default portfolio in many employer plans, not being invested exclusively in a riskless fashion.⁸

Proposition 1

If the expected return on the risky asset exceeds the risk-free rate, then the optimal holding of the risky assets is positive for all investors. Hence, the optimal default investment portfolio is risky.

In assessing the potential benefits and consequences of a default portfolio selected by the employer, it is important to understand how the employer would determine the default portfolio and which employees would be most likely to select it. At a minimum, we would not expect all individuals to select the default portfolio. Indeed, if all individuals selected the default portfolio that could not reflect the full diversity in employee investor circumstances. Individual employees differ in many ways that would be relevant to their investment decisions in the tax-deferred account, including their age,⁹ sophistication and costs of decision making, risk aversion and wealth (including the split between tax-

⁶ See Choi, Laibson, Madrian and Metrick (2004, p. 95).

⁷ For example, under the CAPM individual investors would not sell short the risky market basket in light of the risk premium for the market portfolio and market clearing.

⁸ The analysis does not provide a direct explanation for the change in the default portfolio in many employer plans (going from riskless investing to a risky allocation), because it does not account for the prior use of a risk-free default.

⁹ The standard target-date fund formulation for the default portfolio would take into account the investor's age (though not necessarily in the manner desired by the investor).

deferred and taxable wealth). This raises an interesting question. Which investors would be most interested in departing from the default portfolio selected by the employer? The employer's choice of a default portfolio should not reflect the full distribution of employee investor types, but rather those who would select it and avoid the costs of implementing a customized choice. Certainly, sophisticated investors could feel that they make a more appropriate overall asset allocation selection/choice. Investors with relatively more funds in their employer tax-deferred account would be less likely to delegate the decision to the employer (at least for a given level of outside wealth, a given age and extent of past service). That's because the decision would be of relatively more consequence to them. Analogously, we would expect that relatively higher income individuals would tend to be more proactive in their allocation choice (due to larger absolute amounts in the employer account and due to greater sophistication and expertise on average). While higher income individuals have greater value to their time and to their human capital, nevertheless they should be more likely to be proactive and less likely to use the default allocation—as the time required for choosing would seem relatively modest for higher income individuals (at least to make a basic decision).

Of course, risk aversion has a major impact on asset allocation. Conventional theory teaches that the less risk averse the investor, the greater the holdings of the risky asset relative to the riskless asset. For example, under constant relative risk aversion the individual invests a constant proportion of this wealth in the risky asset (and a constant proportion in the riskless asset) no matter what his wealth level.¹⁰ The more risk averse the investor (i.e., the greater the coefficient of relative risk aversion), the smaller the fraction of his portfolio that he allocates to the risky asset. Under what circumstances would this investor be willing to rely then upon the default portfolio? When the portfolio desired by the individual participant is close to the default portfolio (so that it is not worth the cost of customizing the portfolio), then the participant

would likely rely upon the default portfolio. In effect, if the coefficient of relative risk aversion is relatively low or relatively high compared to the coefficient implicit in the default portfolio, the individual will implement his customized allocation within the employer plan. The resulting cutoffs for the coefficient of relative risk aversion depend upon the other parameters, such as the amount that the individual is investing through the employer plan.

There also is an interesting dynamic to choosing an actual individual allocation rather than relying upon the default allocation. The relevant decisions are to a degree long-term decisions (even though easily changed) rather than just one-time decisions—hence, a decision may be very significant for someone with a small current balance (who recently started employment, for example) due to the future cumulative effects. Still, we would expect that younger individuals (who would have smaller balances and less experience) would be more likely to rely on default allocations. Furthermore, the cumulative aspect of these decisions suggest that once individuals make an active asset allocation they are more likely either to continue those decisions or make new decisions after changing employers.¹¹ These types of hypotheses reflect a variety of implicit costs to decision-making.

Proposition 2

The individual employee investor is more likely to rely upon the default portfolio chosen by the firm during his early years with a firm.

3. Formal framework

For simplicity, we will assume initially that all of the employee's wealth is invested through his retirement plan and that the investment decision covers a static one-period problem. The employee investor has wealth W in this retirement plan; the asset allocation in the retirement plan is set by the employee investor at a cost c —unless the investor chooses to adopt the default allocation as structured by the employer. The investor is

¹⁰ The only utility functions defined over realized wealth with this property are power utility and log utility.

¹¹ An important regularity in asset allocation data is that individuals rarely switch their active allocation of new funds or rebalance existing retirement plan investments (Ameriks and Zeldes (2004)).

assumed to have a constant coefficient of relative risk aversion equal to R . We let $\alpha(R)$ denote the fraction of wealth that the employee with risk aversion R would invest in the risky asset if he incurs cost c and $\alpha\text{-employer}$ is the fraction of wealth in the risky asset in the default portfolio selected by the employer, which is known by the employee.

If the investor incurs the cost c , then his optimal risky portfolio fraction, $\alpha(R)$, decreases with his risk aversion, R (this is a standard feature of portfolio problems with a riskless asset and single risky asset under the assumption of constant relative risk aversion). When would the investor choose to incur cost c rather than employing the default portfolio? He would do so when his risk aversion is sufficiently high or sufficiently low—i.e., when his optimal portfolio mix is either far above or far below $\alpha\text{-employer}$, which itself depends upon the distribution of preferences as perceived by the employer.

Proposition 3

The individual employee investor chooses his optimal portfolio when his coefficient of relative risk aversion is relatively high or low and relies upon the default portfolio chosen by the employer for intermediate levels of risk aversion.

The decision of the employee investor as to whether to incur costs rather than using the default portfolio depends upon the ratio of W/c ; if there is sufficient wealth to be invested per unit of cost, then the employee investor will incur the cost and make his own asset allocation choice (reflecting his own risks), while if the wealth to be invested is modest per unit of cost, then the employee investor will rely upon the default portfolio. Fixing c , employee investors with sufficient wealth select their own portfolio mix, while investors with more modest wealth rely upon the default portfolio. An interpretation of the parameter c is that higher values of c reflect the investor being less sophisticated (so more costly for the individual to select his portfolio). Of course, the composition of employee- investors who the employer

perceives should select the default portfolio influences how the employer selects the appropriate allocation for it. The selection of the default portfolio by the employer should reflect only those employees who will use the default (of course, the composition of the default portfolio may influence those on the margin of selecting the default portfolio). This highlights that the employer should be especially focused on setting the default for those with relatively modest funds and those who are relatively less sophisticated (high cost c), as these will be the employees who utilize the default portfolio.¹² In effect, this suggests a paternalistic focus on those with modest funds for designing the default portfolio.

Proposition 4

The individual employee investor relies upon the default portfolio chosen by the employer, if the individual's wealth in the retirement plan or sophistication is sufficiently low and otherwise chooses a customized portfolio.

4. Default vs. individual asset allocation: Further perspectives

In the formal analysis in the prior section we did not explicitly condition upon the investor's age. For a variety of reasons, including the extent of future human capital and the remaining horizon over which the individual plans to spend his resources, the individual's optimal portfolio allocation would depend upon his age. On the other hand, the target-date funds approach also can lead the default portfolio to depend upon the investor's age, though in a particular manner that may not line up with the particular preferences of the individual. The dependence of age in the target-date fund approach may not align so closely with how the individual employee investor conditions upon age in light of the individual's specific preferences, which would reflect his anticipated retirement age (which could be earlier or later than implicit in the target-date fund portfolio) and the nature of the investment horizon that he anticipates (including the extent to which he is investing indirectly on behalf of his

¹² However, the employer may weight relatively more those with relatively larger accounts (due to their being larger investments) when the employer perceives they will actually select the default portfolio.

heirs). In this sense, the investor's age would potentially influence whether the individual chooses to make his own determination rather than relying upon the default portfolio.

Another important aspect in practice governing the possible use of the default portfolio is that such a structure would only apply to the employer's 401(k) and 403(b) plans and not to either other tax-deferred retirement plans or the employee's personal taxable funds. We know that the employee investor should optimally first hold equity in his taxable accounts and riskless assets first in his tax-deferred accounts (see Dammon, Spatt and Zhang (2004) and Dammon, Poterba, Spatt and Zhang (2005) for related discussion on asset location in taxable and tax-deferred accounts). The discussion here suggests that similar comparative statics should obtain with respect to the use of the default portfolio in the employer account.

An additional point to highlight is that the use of the default in the employment account would likely decline over time, assuming that the cost structure of choosing and implementing an active portfolio would decline so that use would increase over time.

5. Concluding comments

The employer's default portfolio allocation influences which employees choose to bear the costs associated with determining a more customized asset allocation in his retirement plan. Our analysis offers several important insights including explaining why the optimal default allocation is not a riskless allocation; why the optimal default allocation should not reflect the full joint distribution of employee characteristics but those who are anticipated to select the default portfolio; the nature of systematic differences over which employees will choose a customized allocation and which employee rely upon the default allocation; and why improvement in the default allocation can damage the individual's ability to manage his retirement funds over time.

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