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ADVANCING LIBERTY WITH RESPONSIBILITY BY PROMOTING MARKET SOLUTIONS FOR MISSOURI PUBLIC POLICY

DEFINED BENEFIT AND DEFINED CONTRIBUTION RETIREMENT PLANS

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EXECUTIVE SUMMARY

The mission of the Show-Me Institute is: "Advancing liberty with responsibility by promoting market solutions for Missouri public policy." This study addresses an important issue with implications for public policy: retirement plans. It compares defined benefit (DB) and defined contribution (DC) retirement plans in order to assess whether the recent trend toward DC plans is, on balance, beneficial to workers. It further identifies policies — both public and private — that would make retirement plans more effective, with the goal of advancing liberty and responsibility.

DB plans are characterized by a higher degree of certainty for plan participants than DC plans, but have a lower average rate of return. DC plans offer more choices to workers, and thus are generally preferable. If a worker prefers the lower risk and lower return of a DB plan, most DC plans include investment options that enable that outcome.

However, some workers enrolled in DC plans make suboptimal choices, raising the question of the proper role of the company and of government in influencing those choices. To what extent should we allow people to make bad decisions? What if the consequences of those decisions fall on innocent third parties? Public and company-level ("private") policy can range from abstaining from intervention of any sort to mandating that workers make certain choices. This study examines these extremes, as well as one type of middle path between them.

I. PURPOSE AND OVERVIEW

A common view of the sources of retirement income in the United States is the three-legged stool of Social Security, personal savings, and

payments from retirement plans. However, Social Security income is frequently insufficient to continue a household's lifestyle in retirement, while the U.S. personal savings rate has hovered near zero for most of the last decade. Consequently, having a sound and appropriate retirement plan has become increasingly important for individuals and also has implications for public policy.

This study compares defined benefit (DB) retirement plans with defined contribution (DC) retirement plans from the perspectives of the employee and the employer. Its purpose is to assess whether, or under what circumstances, the trend toward DC plans is beneficial to workers. Would a return to DB plans be better for them? This study describes the relative strengths and weaknesses of different plans, and makes suggestions for optimal implementation.

The present study also identifies policies that would make retirement plans more effective for workers. The current financial crisis has generated a backlash against DC plans because many participants have experienced substantial declines in their DC account balances. It is thus important for policymakers, as well as employees and employers, to understand the strengths and weaknesses of each type of plan. Because of its importance, the question of the proper role of government in influencing the decisions of firms and individuals about their retirement plans is discussed in a separate section.

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II. DEFINITIONS AND TYPES OF RETIREMENT PLANS

Retirement (pension) plans are offered in both the private and public sectors. The plans can be grouped into two broad categories: defined benefit plans and defined contribution plans. The study starts by providing basic definitions of each, comparing their most salient features, and discussing variations of each type of plan. Throughout, I use the words "employee," "worker," and "plan participant" as synonyms; I also use the words "employer," "company," and "plan provider" as synonyms.

A defined benefit (DB) plan is characterized by the promise of an employer to provide clearly identified ("defined") income benefits in retirement, based on some formula. For example, the employee may receive 80 percent of her last year's salary annually as long as she lives, assuming she has worked for the employer for at least five years.[11] The focus in such plans is the benefit promised to the employee *during retirement*.

A defined contribution (DC) plan is characterized by the opportunity it provides the employee to contribute to a retirement account and, often, to direct how that money is invested. The employer may or may not contribute. Upon retirement, the employee (now retiree) can choose how to draw down the accumulated balance, subject to regulatory and plan limitations. The focus in such plans is the contributions by the employee *while working.* The best known type of DC plan is the 401(k), named after the part of the law that created

such accounts. In the nonprofit sector, the 403(b) is essentially identical to the 401(k). Contributions to 401(k) plans are usually made with pre-tax dollars. That is, there is a tax savings in the year that the contributions are made.

The differences between these two types of plans are numerous and significant. The most important differences are as follows:

• **Who pays?** Typically, the employer pays into DB plans. That is, the employer makes periodic payments that are then invested to pay for current and future benefits to retirees. In some cases (as recently occurred in the University of Missouri system), employees are required to contribute to a DB plan. If the employee leaves the workplace before becoming vested (gaining ownership rights in the plan), her contributions are returned to her. Within limits, the contributions to DB plans are deductible expenses for the employer.

Typically, the employee pays into DC plans. In some DC plans, the employer will match, partially or fully, the contributions of employees; there is usually some limitation on the employer's matching contribution. For example, the employer might match dollar-for-dollar the contributions made by the employee, up to 6 percent of the employee's income. These monies go into an individual account, and the employee decides how they are invested.

In short, the financial obligation falls on the employer for DB plans and on the employee for DC plans. This disparity is one reason for the shift from DB to DC plans that is under way in the United States — employers have been looking to offload both the obligation to fund the retirement plans of their employees and also the investment risk associated with retirement plans (see below).

However, the entity that pays *into* the plan may not be the same one that pays *for* the plan. For example, in companies with DB plans, the salaries of workers might be lower than they would have been in order to compensate for the financial obligation of the employer. So, one should not conclude that DB plans are in any sense a free lunch for workers. More generally, employee compensation consists of salary, retirement benefits, health benefits, and other factors; it is the total cost of this package that is important to the employer, and there are tradeoffs among the various components of compensation.

• **Who decides how the money is invested?** In DB plans, the employer makes this decision. The responsibility coincides with the responsibility to ensure that the DB plan is sufficiently well funded to eventually generate the promised payments. In DC plans, the employee decides how the money is to be invested. However, the employer decides which investments (e.g., which mutual funds) are eligible for investing, and how many alternatives to offer. In this way, the employer has an indirect but powerful influence on the investment choices of DC plan participants.

• **Who bears the risk of poor investment performance?** A DB plan represents a promise to pay benefits in the future; thus, the employer bears the risk of poor investment performance. If the plan becomes underfunded (that is, if the amount invested becomes

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In a direct contribution plan, employees are immediately vested in the contributions they make; after a certain period of time, they are also vested in any contributions made by the employer.

insufficient to satisfy the plan's future obligations), the employer may have to increase his contribution to it. In contrast, in a DC plan, the employee bears the risk of poor investment performance and, conversely, reaps the rewards of good investment performance. The retirement income will depend on how much money has accumulated in the plan and on investment performance.

• **What determines who can participate and when participants are eligible to collect benefits?** For both DB and DC plans, plan documents describe the requirements, which differ from plan to plan.

• **When does vesting occur?** Vesting refers to the "ownership" of the individual employee's retirement account. In DB plans, employees typically become vested after they have worked for the employer for a certain number of years or, less commonly, when they have reached a specified age. If employees leave before being vested, they retain nothing of the employer's contribution, but are entitled to the return on any contributions they have made. In a DC plan, employees are immediately vested in the contributions they make; after a certain period of time, they are also vested in any contributions made by the employer. If employees leave a DC plan (perhaps to take another job), they have several options for dealing with the DC monies. A common approach is to roll the DC funds into an Individual Retirement Account (IRA).

A benefit of DB plans for employers derives from the vesting requirement. Employees who walk away within the first five years of employment provide a windfall for the plan and, ultimately, employers. Although employer contributions in any given year are based on the actuarial (annuity) value of the benefits that will accrue to current employees after retirement, they are subsequently reduced because of non-vested terminations.

• **How are benefits determined?** In a DB plan, there are four approaches to determining benefits. First, benefits can be a stipulated amount. Second, benefits can be defined as a percentage of compensation. Third, benefits can depend on the number of years of service. Fourth, benefits can be a function of the years of service *and* the employee's compensation.

In the fourth scenario, the baseline for the salary level might be the salary of the employee's last year, an average of the salary for the past five years, or some other variation.[2] The formula of a representative DB plan's formula would be the number of years of service multiplied by 2.5 percent, multiplied by the baseline salary. An employee who worked 30 years with a baseline salary of $50,000 would thus be paid 30 times 0.025 times $50,000, equaling $37,500 per year in retirement.[3]

In a DC plan, the retirement benefits are determined by the accumulated balance in the employee's account at retirement. In turn, this balance depends on the contributions of the employee, the contributions of the employer (if any), and the investment performance of the funds invested. The employee can convert the balance to regular periodic payments (an annuity), withdraw it as a lump sum, or employ some combination thereof. The periodic payments are determined

actuarially, depending on the expected lifespan of the employee, whether the payments will continue after her death (say, to her spouse), and other factors. For both DB and DC plans, the benefits are usually paid monthly.

• **Are the benefits guaranteed?** Benefits are said to be guaranteed in a DB plan. However, they might be negotiated downward if the employer is in financial distress. In the event that a private-sector employer goes bankrupt, the Pension Benefit Guarantee Corporation (PBGC), a government agency, fulfills the obligations. But the PBGC payouts are limited, based on the benefits that would have been received and the retirement age of the employee. The maximum that would be paid out for a DB plan ending in 2009 would be $54,000 (PBGC website), short of what some employees might have otherwise received. Moreover, the benefits are guaranteed only in nominal terms (rather than in inflation-adjusted terms). In the presence of inflation, the purchasing power of the income stream from a DB plan will decline over time.

In a DC plan, there is no guarantee of the final outcome. As described above, poor investment performance can lead to small retirement accumulations.

• **How do plans differ?** There are many variations in both DB and DC plans. For example, some DB plans allow for a partial lump-sum withdrawal at retirement. Some DB plans allow for inflation protection for the retirement benefits. A special type of hybrid plan called a “cash balance” plan has features of both DB and DC plans, but is not widely used and is beyond the scope of this study. An Employee Stock Ownership Plan (ESOP) can be regarded as a type of DC plan. A profit-sharing plan is type of DC plan, as is a stock bonus plan (in which the profits are shared via shares of stock).

In what follows, we will focus on the more traditional forms of DB and DC plans. To further our understanding of the variety of possible retirement schemes, the appendix contains brief descriptions of DC plans in other countries.

III. A Recent Addition to the Retirement Plan Universe: The Roth 401(k)

The Roth 401(k) is a hybrid retirement plan, a cross between the Roth IRA and the 401(k).[4] A Roth IRA is distinctive in that the contributions are made post-tax. That is, there is no tax deduction in the year of the contribution, as there is for a non-Roth DC plan, but the withdrawals from a Roth IRA are not subject to tax. As we’ll see shortly, this feature can be advantageous for retirement planning. Roth IRAs also have a number of other benefits. For example, there is no mandatory distribution from a Roth IRA. In contrast, a regular IRA mandates distributions starting in the year that the retiree turns 70½.

Perhaps the greatest disadvantage of a Roth IRA is the income limitation — employees with high incomes are not eligible. For example, in 2007, the Roth IRA was available only to married couples filing jointly with an adjusted gross income (AGI) of less than $166,000; for single individuals, the cutoff was an AGI of

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$109,000. These thresholds will rise with future inflation, but nonetheless result in many people being unable to contribute to a Roth IRA.

The creation in 2006 of the Roth 401(k) addressed this limitation. The Roth 401(k) can be thought of as a corporate Roth IRA. No income limitations apply to eligibility for Roth 401(k) plans. Thus, higher-income employees now have the opportunity to set aside post-tax money, making financial planning more flexible. A minor drawback to a Roth 401(k) is that there are mandatory distribution requirements, but these are easily circumvented by rolling one's Roth 401(k) into a Roth IRA upon retirement (Lange, 2009). Another disadvantage of the Roth 401(k) is that not all employers offer the plan; they are not obligated to do so.

Why would an employee wish to use post-tax dollars to fund retirement?[5] Let's start by examining the argument in favor of using pre-tax dollars. The logic is simple: Using pre-tax dollars, the employee reduces current taxable income and thus reduces her current income tax bill. It is a "bird in the hand" argument, based on the idea that we would rather pay an equal amount of taxes in the future than in the present. Today's tax savings can be invested to grow over the time between the contribution year and the year of the distribution from the account. The logic is valid, as far as it goes.

Let's consider the case in which the tax rate in retirement is lower than the current tax rate. In this case, the use of pre-tax dollars would clearly be preferable. Deferring the payment of taxes costs less in present value, because the tax dollars saved can earn a return over time. Even if the tax rate were the same in retirement, a pre-tax plan is still preferable — the same dollar amount of taxes would be paid in the future rather than in the present.

But what if the future tax rate is higher than the current tax rate? In that case, the advantages of the tax deduction today may be outweighed by the disadvantages of a high tax bill in the future. As Lange puts it, "You pay income tax on the *seed* and you (or possibly your heirs) *reap the harvest* income tax-free" (2009, p. 124; italics in original). Admittedly, if future tax rates are only a little higher, pre-tax plans would still be preferable; The gains from being able to invest the tax savings could still outweigh the additional costs of the higher future tax bill.

Thus, the key to figuring out which plan is better from an employee's standpoint is knowing what future tax rates will be. None of us has a crystal ball. However, as of this writing (March 2010), the United States is running very large budget deficits. It seems almost inevitable that tax rates will rise, perhaps significantly. Financial commentators are increasingly advocating the use of Roth IRAs and Roth 401(k) plans (e.g., *Forbes*, Sept. 7, 2009). Obviously, determining which plan is better depends on the context of the individual. In many scenarios, however, a post-tax plan such as the Roth 401(k) is preferable to a pre-tax DC plan (see Lange, 2009, chapter 7, for a detailed analysis).

Of course, an employee lives his life as an individual, not as an "average case." Where does that leave employers with respect to deciding which plans to offer, and employees with respect to deciding which plans to fund? A middle path would be for the employer to offer both a pre-tax

DC plan and a Roth 401(k), and for the employee to split funding between the two. This tax diversification strategy avoids an "all-in" bet on future tax rates, but it would increase the employer's administrative costs.

IV. Historical Patterns of Usage and Returns

The past two decades have seen a significant shift from DB plans to DC plans in the United States and elsewhere. Survey statistics reported by the Employee Benefit Research Institute (EBRI Fast Facts, 2009) show the composition of primary retirement plans in the United States seen in Table 1 below.

The trend is not limited to the United States. A recent BBC article (Aug. 17, 2009) reports that half of the DB plans in the United Kingdom are expected to close in the next few years. The article cites "financial pressure" on employers as the cause, a phenomenon that will continue in today's economic environment. Many of the surveyed firms are switching to DC plans.

For several reasons, public (government) pensions are not participating in this trend. First, many of the DB plans offered by government entities are underfunded, imposing an implicit obligation on taxpayers to make whole any deficiencies. Second, generous DB public plans translate into active voting blocs for whomever promises the most generous benefits. Third, DB liabilities are not carried on government balance sheets. Thus, there are fewer incentives for the public sector to switch from DB to DC plans.[6]

Table 1. Estimated MTRs and Tax Progressivities by State (2000–2004)

Year	Defined Benefit	Defined Contribution
1988	57%	26% (1)
1993	38%	50%
1998	46%	52%
2003	41%	58%
2006	31%	67%

(1) "Other" and "don't know" account for the remaining categories.

Lacking such access to taxpayer funds, private companies are increasingly shifting to DC plans. Changes in the investment environment have exacerbated the volatility of investments, making shortfalls in funding more likely even as regulatory scrutiny increases. In 2006, a change in accounting rules required most employers to report the value of the plan's future liabilities. Private employers must not only report the value of future retiree liabilities (pension and medical), but also book these liabilities on their balance sheets. (Public employers are required to estimate future liabilities, but not to book them against assets, reducing their incentive to switch to DC plans.)

Furthermore, DB plans are becoming increasingly restricted in their ability to tailor payouts to the actuarial profile of each new retiree. For example, there have been court cases related to monthly payouts that are lower for women because of their longer expected longevity. DC plans avoid such pitfalls.

These explanations focus on the shrinking supply of DB plans. There may also be a shrinking demand for them. Recall that there is typically a vesting period for DB plans. As the structure

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of the economy changes and the work force becomes more transient, workers themselves might come to prefer DC plans. If they change jobs before the vesting period is complete, a DB plan leaves them with nothing. But if they change jobs under a DC plan, they can keep at least their own contributions to the plan.

The trend toward DC plans affects both employees and employers. It also has consequences for public policy if the trend means that either more or fewer persons will be self-sufficient in retirement. The next section will discuss the impacts on employees and employers, but first it's important to lay the groundwork for that discussion by examining the historical performance of DB and DC plans. Obviously, we can perform this comparison only at the broadest level; there is, no doubt, substantial cross-sectional deviation within each plan category. Nonetheless, the data suggest the relative merits of the two plans with respect to the financial well-being of workers (retirees).

Estimating the wealth accumulation in any pension plan is difficult. Relevant factors include the age at which contributions begin, how assets are allocated, and the relative contributions of employee and employer. Another complication is the possibility that if there were no retirement plan, salaries would be higher. In order to see how outcomes vary as these parameters vary, the research must use simulations and make assumptions about these parameters.

Arguably the best analysis of the wealth accumulations possible in DB and DC plans is provided by James Poterba and his coauthors (Poterba, Rauh, Venti, and Wise, 2007), who run simulations of wealth outcomes under a varying set of assumptions. Noting that the outcomes for individual cases are sensitive to changes in the parameters, the authors provide evidence that, on average, DC plans result in greater wealth accumulation at retirement age than private-sector DB plans do.[7] DB plan assets tend to be invested conservatively, whereas DC plan participants have the freedom to invest more aggressively (whether or not they do so), leading, on average, to higher realized returns for them.

Of course, there is no free lunch. If a DC plan participant invests more aggressively, she takes on more risk, and there is a higher probability of a very small amount of wealth having been accumulated by retirement age. This is the outcome seen in the simulations of Poterba, et al. As they put it, "DC plans are also more likely to generate very low retirement wealth outcomes" (p. 2,062).

The seeming importance of DB income for current retirees is documented by the National Institute on Retirement Security (Porell and Almeida, 2009). Their study shows that 23 million older Americans received DB pension income in 2006. That income helped many retirees avoid financial hardships. The authors estimate that DB income reduced by 1.35 million the number of households receiving means-tested public assistance, thereby reducing taxpayer expenditures by an estimated $7 billion.

Although these estimates speak to the positive aspects of actual DB income received by older Americans, they do not account for what-if scenarios. What if these households had been enrolled in a DC plan instead? The analysis by

Poterba and his colleagues is more comprehensive, allowing us to reach some tentative answers to this question.

We now investigate how thoughtful and informed implementation of a retirement plan can significantly reduce the chances of bad outcomes for plan participants. Because DC plans are increasingly important, our emphasis is on their implementation.

V. OPTIMAL IMPLEMENTATION

• **DB plans.** Implementing DB plans entails the following considerations: First, does the employee contribute to it? Second, under what circumstances does the employee become vested? Third, what benefit formula is used? Fourth, what is the investment policy of the plan?

Like other kinds of investing, pension plan investing faces the tradeoff between risk and return. The *liabilities* of the plan are the current and promised future payouts to retirees. The present value of the liabilities can be estimated using projections about the magnitude and timing of the payouts and the appropriate discount rate.[8] The *assets* of the plan are the invested contributions, which are already measured in present value.

From the point of view of the employee, it is desirable that the plan be fully funded, i.e., that the present value of the assets be at least as great as the present value of the liabilities. The financial crisis of 2007–2009 caused many DB plans to become underfunded, leaving insufficient assets to pay the promised outlays. Unless investment returns are higher than normal during the next few years, employers will either have to increase their contributions to the plans, ask employees to increase their contributions, or both.

All other things being equal, employers would prefer to pay in as little as possible — the contributions are a cost of doing business.[9] Employers also have some incentive to pursue relatively risky investments. If the investments yield a high return, the plan becomes overfunded and the employer's contribution can be decreased. Although low-investment returns will leave the plan underfunded, in the worst case, the Pension Benefit Guarantee Corporation will step in to provide the benefits. We have already noted the limitations of the PBGC guarantee.

In general, it benefits both the employer and the employee to keep plan expenses to a minimum. That said, the recent pay-for-play scandals in New York and California suggest that plan overseers might make suboptimal choices if they can benefit personally from such choices. Economists refer to this conflict of interests as an agency problem. The agency problem arises when the interests of decision makers are not well aligned with those of beneficiaries.

• **DC plans.** Implementation of DC plans is quite different from implementation of DB plans. In what follows, we examine the most important of the many critical decisions that the DC plan provider must make.

• **Opt-in or opt-out?** If a new employee is given information about the DC plan and then asked whether he wants to sign up, that's an "opt-in" approach. If he is told "You're enrolled unless you tell us otherwise," that's an "opt-out"

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approach. It may seem to make little difference which approach the employer takes. After all, if someone wants to participate, it is easy to do so under either approach (just some paperwork to opt in, for example).

As it turns out, though, people tend to defer to the default option. Experience shows that if the opt-in approach is taken, the initial participation rate is about 20 percent, and climbs to only 65 percent after three years. If the opt-out approach is taken, the initial participation rate rises to 90 percent (Madrian and Shea, 2001), and rises to more than 98 percent after three years. The differences in both initial and longer-term participation rates are dramatic.[10] If we assume that saving for retirement is desirable, the opt-in/opt-out decision by the employer is a critical decision — and the opt-out approach should be taken.

• **The array of investment alternatives.** The plan provider also decides how many alternatives employees have to choose from. At first glance, it might seem the more the better. After all, a larger menu of choices gives one greater flexibility to tailor a retirement portfolio to risk tolerance and other factors. However, substantial evidence suggests that, beyond a certain point, more choices actually make people feel worse off (Schwartz, 2004). People can become overwhelmed by the number of choices. There is also a greater chance of buyer's remorse: "I see now that I should have chosen mutual fund X rather than mutual fund Y." And, with more possibilities for investing, there is a greater chance that one of the foregone alternatives will outperform the chosen alternatives.

When faced with a great array of choices, many employees resort to the "1/N rule," dividing their contributions equally among the N choices (Thaler and Sunstein, 2009). But this rule can lead to very different outcomes, depending on the specific choices available. For example, let's say that Firm A offers two mutual funds, one that invests in stocks, the other in bonds. The 1/N rule would lead to a portfolio that starts off with 50 percent in stocks, 50 percent in bonds. Firm B offers two choices as well: a stock mutual fund and a mutual fund that is split 50/50 between stocks and bonds. An employee with Firm B following the 1/N rule would end up with a portfolio that starts off with 75 percent in stocks and 25 percent in bonds, quite different from the portfolio of 50 percent stocks and 50 percent bonds held by the employee of Firm A.

This example illustrates the importance of the characteristics of the investment alternatives offered in a DC plan. It also suggests the importance of understanding the asset allocations of each alternative.

• **Employee education.** The widespread financial illiteracy in the United States means that employees often make uninformed choices that may harm their financial well-being. Making matters worse, many retirement plan administrators themselves have little or no training in retirement planning (Paskin, 2009). The result: horror stories of bad advice and bad outcomes. An absence of advice may be better than bad advice!

This problem is important not only for the individual, but for public policy as well, inasmuch as citizens who are not financially self-sufficient will make demands on the

government for support. Employers can help by providing employees with financial education, e.g., lunch-hour workshops by impartial third parties, and by helping them gain access to financial advisers who can provide unbiased advice.

• **Default allocation.** The division of an investment portfolio into different types of assets — for example, 50 percent stocks and 50 percent bonds — is referred to as asset allocation. Even a summary of the substantial body of research and advice dealing with asset allocation is beyond the scope of this study. But asset allocation has been shown to be the key determinant of investment performance (Brinson, Hood, and Beebower, 1986; and Brinson, Singer, and Beebower, 1991), and good investment performance in a DC plan leads to higher wealth at retirement. Perhaps more subtle (but no less important) is the notion that one's portfolio should be consistent with one's tolerance of risk and capacity to take on risk. Someone near retirement probably should not be investing wholly in very risky assets.

Many DC plans have a default asset allocation. If the employee does not specify an allocation, the funds are automatically invested in the default proportions. Choosing the default asset allocation can be problematic. Some DC plans choose the least risky alternative (say, a mutual fund that invests in U.S. government bonds) in order to minimize losses for the plan participant. But there is a tradeoff between risk and return. Although U.S. government bonds are very safe, they provide relatively low returns. Evidence suggests that some DC plan participants typically invest too conservatively (Laise, 2009).

It is impossible to give employers one-size-fits-all advice about the default asset allocation. Determining which type of allocation is good for most employees depends on several factors, such as the fact that a relatively young workforce can reasonably take on more risk than an older workforce. Employers can consult with unbiased financial advisers to determine the best default asset allocation. And, because one size never fits all, individual counseling by impartial advice-givers is also important.

• **Contribution rates.** Most DC plans have a default contribution rate as well as a default asset allocation. If the employee does not specify the percentage of earnings that are to be put into the plan, the default rate dictates the outcome. A low default rate (many plans use 2 percent) does not ensure that the employee is saving enough for retirement. A high default rate might discourage employees from signing up at all, because it could be seen as a type of pay cut.

Employers can take at least two actions in this situation. First, they can encourage higher contributions through the use of matching funds. For example, the employer might match, dollar for dollar, contributions of the employee up to some limit, say 6 percent of the employee's income. Retirement planners often refer to the employee match as "free money." This positive impression increases contribution rates by employees.

Second, employers can encourage employee contributions to increase over time by implementing the Save More Tomorrow program (Thaler and Benartzi, 2004). Save More Tomorrow asks participants to commit themselves now

Asset allocation has been shown to be the key determinant of investment performance, and good investment performance in a direct contribution plan leads to higher wealth at retirement.

to increasing their savings in the future, with the increases coinciding with pay raises. Human nature makes it easier for us to commit to save more in the future than to increase our savings immediately. Case studies show that the Save More Tomorrow program dramatically increases savings rates over time (Thaler and Sunstein, 2009). The program is becoming widely used, with great success.

• **Employer's stock in a DC plan?**[11] Many companies encourage their employees to buy shares of the company in the DC plan. This encouragement often takes the form of a financial inducement, e.g., being able to purchase the stock at a discount. But this strategy is risky. If the company does not do well, the employee is at risk of being laid off at the same time that the company's stock is dropping in price.[12] Buying an employer's stock (whether in a DC plan or not) doubles the risk associated with the viability of the company. Any former employee of Enron will explain the downside of such a strategy. It is understandable that an employer would want its employees to own shares of the company, but it makes little sense from the point of view of the employee. Meulbroek (2002) estimates that, from the perspective of the employee, a dollar in company stock is worth less than half a dollar in a well-diversified mutual fund. That is, they would be better off getting 50 cents contributed to a mutual fund than receiving a dollar's worth of company stock.

Buying an employer's stock (whether in a direct contribution plan or not) doubles the risk associated with the viability of the company. Any former employee of Enron will explain the downside of such a strategy.

• **Expense ratios.** The investment alternatives in a DC plan will often be an array of mutual funds. Mutual funds are good vehicles for achieving levels of diversification that an individual could not achieve on his own. Diversification reduces the risk associated with any one investment, and thus is a desirable attribute of a DC plan investment.

Mutual funds differ significantly in the amount they charge for managing the funds. These expenses can range from less than 1 percent to 3 percent, and even higher. While the 2-percent difference may not sound like a lot, it results in a return that is 2 percent lower each year than it would otherwise be, resulting, over many years, in dramatic differences in wealth accumulation. For example, $2,500 invested each year for 20 years, earning 8 percent each year, will grow to about $114,500. At 6 percent, the same contribution stream will grow to only $92,000, a $22,500 difference. Expense ratios matter.

Some mutual funds, called index funds, are designed to match the return performance of some index, say, the S&P 500. Index funds are useful for two reasons. First, they typically have low expense ratios because they do not trade their stock holdings much. Second, they offer diversification — not putting all your eggs in one basket — for a minimal investment.

In sum, employers need to make good choices when implementing or changing their DC plans. They should: 1) offer opt-out rather than opt-in plans;[13] 2) think carefully about the menu of investment alternatives; 3) help educate their employees about personal finance; 4) think carefully about the default asset allocation and contribution rate; 5) use the Save More Tomorrow program; 6) abstain from encouraging employees to own company stock; and, 7) choose investment alternatives with low expense ratios.

VI. PUBLIC POLICY: THE ROLE OF GOVERNMENT

This section focuses on possible public policy approaches to DB and DC plans. The first part of the next section looks at the incentives for companies to adopt the implementation advice of section V, which we will call "private policy."

In terms of freedom of choice for workers, DC plans are superior to DB plans. They offer a wider array of investments, including low-risk alternatives that can be used by workers who wish to mimic the risk-and-return profile of a DB plan. In short, DC plans allow for outcomes that are similar to DB plans, but also offer alternatives with higher risk and higher potential return.

Yet recent advances in behavioral economics suggest that people are limited in their ability to assess information, think rationally about alternatives, and generally make good decisions. For example, there is evidence that people suffer from a "recency bias," giving too much emphasis to recent events. This bias can lead to "return following," that is, to switching investments to asset classes or fund managers that have performed well recently. But the evidence is convincing that chasing returns is not a winning strategy.

So, how should government respond to the bad decisions that individuals make? One possibility is a hands-off approach, letting people plan without any help or mandates, and suffer the full consequences of those decisions. This is the approach taken in many areas of life. We don't, for example, regulate how high people should set the blade on their lawnmowers. If they cut the grass too low and it dies, well, that's their problem. They are likely to learn from the experience and not repeat it. Often, in such cases, the consequences of the bad decision do not extend significantly beyond the person making the decision.

But what if the consequences of a bad decision go beyond the decision makers? In the case of retirement plans, failure to save adequately could lead a person to make demands on society for support, descend into a life of poverty or homelessness, or both. Prevailing opinion in the United States holds that there ought to be some sort of safety net for people who find themselves, for whatever reason, without resources. In this case, the consequences of a person's bad decisions fall on others, often on taxpayers.

In this scenario, one might argue for some government intervention to guide people to make better decisions. One possibility would be to force workers to make choices that are known to be effective. To note an example from a different setting, the Homeownership Affordability and Stabilization Plan of 2009 proposes mandatory financial counseling for certain borrowers. In the context of retirement plans, state or national government could mandate that all workers participate in a DC plan and contribute at least 6 percent of their salaries to it.

This kind of policy is unattractive for at least two reasons. First, it advances neither liberty nor responsibility. It assumes that the government knows what is best for each worker, and that one

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size fits all. It reduces workers' choices and removes the responsibility for their decisions. Second, as noted above, high levels of retirement plan participation may lead a company to reduce salaries or other benefits. While some workers will prefer this tradeoff, others will not. Mandating worker choices through public policy is paternalistic and coercive, and would force some workers to make choices that are not in their best interests.

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Thus far, we have identified two extreme approaches to public policy: a completely hands-off approach and a "mandate" approach. There is a middle path, referred to as "libertarian paternalism," that is associated with the scholars Richard Thaler and Cass Sunstein. The essence of this view is captured in the title of their book *Nudge*. The idea is to nudge people to make better decisions when there is clear evidence about what constitutes a better decision, by framing their choices in a such a way that the better choice is more likely to be selected. For example, Thaler and Sunstein advocate using the opt-out framework for pension participation rather than the opt-in framework.

Despite the legitimate concerns of some economists about the slippery slope of regulation and their observation that regulators are both subject to the same biases as the people whose behavior they hope to change, and lack sufficient knowledge about the many and varied preferences that their regulations would seek to shape (Rizzo and Whitman, 2009), there is an arguable role for some government intervention in this context because the consequences of bad retirement decisions may fall on innocent third parties. Middle-path policies might, for example, require firms to adopt opt-out plans. Because participation is, in fact, an option, no worker is compelled to participate. But human inertia means that instituting an opt-out policy would result in higher rates of plan participation. And higher participation rates would reduce the number of impoverished retirees resorting to use of the social safety net.[14]

The middle path would entail little restriction of the liberty of employees, and leave them a great deal of responsibility (e.g., to allocate assets). It strikes a balance between overzealous public policy and a complete absence of public policy, both allowing liberty and retaining a great deal of responsibility. It should be stressed, however, that employers are already free to institute such a middle-path pension framework without first facing a regulatory requirement, as described in section V.

VII. OTHER ISSUES

• Why should firms offer DC plans? Many of the suggestions for implementation made in section V are costly to the company. For example, educating employees might involve out-of-pocket costs (paying for third-party presentations and advice), as well as implicit costs (time away from work). In addition, because more workers participate under an opt-out plan, the employer's matching contributions would be greater. So, why would companies voluntarily adopt these suggestions?

First, it might be a cost-effective way to compete in the labor market, especially in a period of transition from

DB to DC plans during which some other firms have not yet considered the details of implementing a DC plan. Second, facilitating good retirement decisions might reduce turnover, make for happier employees, and boost productivity. Third, the employer might be able to buy some services (e.g., financial counseling) more cheaply than individual workers can on their own. Fourth, the total package of compensation matters most to an employee (e.g., salary, health and retirement benefits), rather than just one dimension of compensation. Some employees will prefer working for a company that supports good decision making, even if it means a lower salary or other benefits.

Each company must ascertain whether the benefits exceed the costs. It is a difficult calculation, in particular because the costs are more evident than the benefits. In the long run, firms will gravitate to their optimal level of implementation in order to stay competitive.

• **Tax considerations**. In a DB plan, employer contributions are a tax-deductible expense. In a DC plan, employer contributions are also a tax-deductible expense, and employee contributions are made with pre-tax dollars. That is, the contributions reduce the employee's taxable income in the year of the contribution.

Another tax issue relates to the gap between the ordinary income tax rate and the capital gains tax rate. Under the current tax system (which will almost certainly change), the gap can be as high as 25 percent, with the tax on ordinary income being higher. The gap is relevant because the retirement income received from pre-tax plans is taxed as ordinary income, even if the gain in asset value has resulted largely from capital gains (price appreciation). In a post-tax IRA, the investment gain, rather than the distribution of contributions, is taxed as ordinary income. In short, the tax gap discourages contributions to a normal IRA and highlights the attractiveness of the Roth IRA.

• **Job tenure**. Because the payouts of many DB plans are a function of the number of years worked, DB plans reward longer job tenure. Although workforce stability is generally a desirable trait, a DB plan can lock workers into jobs that they would otherwise leave. Consistent with this conjecture, Allen, Clark, and McDermed (1993) document a negative relation between DB plans and labor turnover, a phenomenon sometimes referred to as "bonding." This may also result in employees overstaying their welcome, that is, staying on the job when an employer would prefer that they leave. Not all employee turnover is bad.

• **Timing of retirement**. As noted above, the bonding effect may encourage employees to work longer under a DB plan than they would under a DC plan. However, DB plans can be designed to penalize workers financially if they work beyond a given retirement age. This penalty can result in some workers retiring earlier than the employer would prefer. Not all employee turnover is good.

• **Job horizon**. In general, DB plans allow for greater contributions than DC plans. Thus, DB plans may be more desirable for employees who plan to retire within, say, 20 years. Yet few employees actually maximize their retirement

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contributions, so this difference may not be critical to the choice between a DB and a DC plan.

• **Recent developments**. Two recent articles in the *Wall Street Journal* report that a few employers are beginning to adopt the suggestions made in this paper. Laise (2009) describes how some pension consultants are urging employers to direct 8 percent of workers' salaries automatically into their 401(k) plans. This approach is an aggressive version of the opt-out strategy discussed in section V. Other pension consultants are advising employers to take an active role in discouraging, or even prohibiting, employees from borrowing from their retirement savings.

We have noted the importance of the default asset allocation, the mix of different types of assets in which the participant will invest if she does not choose herself. Some companies have begun to select target-date funds as the default option. A target-date fund chooses an asset allocation that is consistent with the worker's expected time to retirement. Young workers tend to be heavily invested in stocks (more risk, but higher potential return), with the assumption that their expected longer investment horizon will enable them to recover from bad years in the market. For workers closer to retirement, a target-date fund shifts the asset allocation to relatively safe investments, such as government bonds. Given that stocks tend to outperform less-risky investments over long time horizons, target-date funds are a logical choice for the default option.[15]

Tergesen (2009) describes a growing trend of employer-provided financial counseling for employees. One concern in this setting is whether the advice-giver is impartial; the article notes that some advisers tended to recommend the products of their own firm disproportionately. An alternative would be for the employer to hire a fee-based adviser with no products of his own to sell.

• **Greater awareness and more information**. Awareness of the limitations of retirement plans has increased, in large part because of the financial crisis that started in 2007; if there is a silver lining to the crisis cloud, this is it. Advances in our understanding of behavioral economics suggest viable and effective solutions to many of the impediments to effective implementation of retirement plans, especially 401(k) plans.

Also, thanks to technology, more information is readily available to workers about their plans. Third parties that provide pension-related information have created important innovations in this area. One example is a website recommended by the *Wall Street Journal* (Nov. 14, 2009), brightscope.com. According to the site, Brightscope "quantitatively rates 401k plans and gives plan sponsors, advisors, and participants tools to make their plans better." The service rates about 7,000 plans that cover about 22 million workers.

With greater transparency and constructive ideas about improving plans, 401(k) pensions will become more effective and thus more likely to allow plan participants to achieve their financial retirement goals.

VIII. SUMMARY AND CONCLUSIONS

A recent *Time* magazine article explains "Why It's Time to Retire the

401(k)" (Gandel, 2009). Citing both anecdotal and large-sample evidence, the author argues that 401(k) plans have not been performing as well as expected. The current financial crisis has, of course, substantially dented balances in 401(k) accounts, fostering discontent with the 401(k). However, the article offers little in terms of viable alternatives.

At present, there are two kinds of retirement plans: defined benefit (DB) and defined contribution (DC). This study has sought to provide insight into two key questions. First, do workers benefit from the trend away from DB plans and toward DC plans? Second, are there public and private policy steps that can make retirement plans more effective for workers, without compromising liberty, freedom of choice, and the potential to reap gains from market participation?

The first question is easy to answer, at least conditionally: Yes, workers are better off in general with DC plans than with DB plans, assuming that they make reasonable choices about their level of contributions, asset allocation, and other aspects of the plan. The superiority of DC plans over DB plans is based on the assumption that a DC plan allows a worker to create a risk/return profile that is similar to that of DB plans.

On the other hand, recent work in behavioral economics has focused on the limits of human capacity to make rational decisions, and has documented commonplace biases in human reasoning. If workers do not generally make good decisions, what public policies are reasonable? Here, there is no one answer. At one extreme lies the notion that the government should take a completely hands-off approach, allowing workers to live with the full consequences of their decisions. As suggested in section VI, this approach is likely to involve imposing the costs of bad decisions on innocent parties. Another extreme is for public policy to mandate certain decisions by both employees and employers.

One possible middle path between the two extremes, specifically, the "libertarian paternalism" of Richard Thaler and others, would involve creating an opt-out default for pension plans when workers join a company. Workers would not be *compelled* to enroll in a retirement plan, but enrollment would be the default. If implemented in the regulatory sphere, this type of "nudge" approach strikes a balance between government intervention in the labor market and the third-party costs that might be associated with a completely hands-off policy. If implemented by individual firms in the absence of such regulation, on the other hand, it represents a "private policy" pension strategy that allows employers to offer attractive benefits while managing costs and increasing employee participation.

If workers do not generally make good decisions, what public policies are reasonable? Here, there is no one answer.

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APPENDIX: DEFINED CONTRIBUTION PLANS IN OTHER COUNTRIES[16]

This appendix describes alternative pension schemes in four other countries: Australia, the Netherlands, Canada, and Chile. The purpose is not to endorse any of them; indeed, they do not seem particularly well-suited for the United States. However, American decision makers need to understand the variety of retirement schemes out there, and draw upon the experiences of other countries to improve their own retirement planning.

• **Australia**. In Australia, the retirement system has two components. First, employers are required to contribute a minimum of 9 percent of a worker's salary to a DC plan. Perhaps unsurprisingly, the minimum requirement has become the standard. Since 2005, workers have not been limited to the investment choices offered by their employers but can choose any registered fund. The program covers about 90 percent of employees, with very low-income workers and the self-employed constituting the other 10 percent. Unlike the traditional DB or DC plans in the United States, employer contribution and investment earnings in Australia are taxable for the employee. To compensate for this front-end taxation, benefits are tax-free if taken at age 60 or later. This scheme is somewhat similar to the Roth IRA in the United States, and reduces retiree concerns about future tax rates. There is also a voluntary layer of personal savings encouraged by a limited government matching contribution, in which low-income workers can contribute after-tax dollars that are matched by up to 1,500 (Australian) dollars per year.

The lesson for U.S. policymakers and employers is the desirability of the Roth IRA, which enables workers not to worry about income tax rates during retirement. Public policy could provide incentives for employers to offer the Roth 401(k), which is voluntary at this time.

• **The Netherlands and Canada**. The Netherlands and Canada have adopted what can be called a collective DC retirement scheme. These plans have three primary characteristics. First, employers make defined contributions. Second, the payout formula is DB. Given assumptions about contributions, workforce growth, retirement patterns, etc., actuaries suggest a DB formula that is sustainable. Third, the benefits actually paid reflect the plan experience, e.g., contribution levels and investment performance. The scheme is collective, in that there are no individual accounts, each with its own individual contributions and investments. Instead, the pool of money is managed professionally. As with a U.S. DC plan, the ultimate benefits paid depend on investment performance. In contrast with a U.S. DC plan, however, the investment risk is shared by all workers. This sharing reduces the extreme outcomes, extremely high accumulation of retirement assets and extremely low accumulation.

A collective DC plan would not have to be adopted nationwide. One can imagine an employer with a large workforce adopting such a plan. Because workers have no investment choices, they would require no education in investments. Of course, the lack of individual choice

American decision makers need to understand the variety of retirement schemes out there, and draw upon the experiences of other countries to improve their own retirement planning.

can be regarded as a negative from the employee's point of view. Nevertheless, the collective DC model could be considered by U.S. companies. The benefit to employees would be the sharing of investment risk.

• **Chile**. The case of Chile is a bit of a detour from our primary focus, because it involves privatization of Chile's equivalent of Social Security. It is worth brief consideration because it shows the magnitude of policy change that can occur, but conflicting assessments of the success of the change suggest that equally large-scale change in the United States is unlikely.

Legislation in Chile in 1980 allowed workers to leave the government-run retirement plan, which was funded by a payroll tax. These workers then contributed to a personal retirement account, essentially a DC plan with retirement benefits that depend on the accumulation in the account. By some reports (e.g., Piñera, 2004), the privatized system was a great success, both for individuals and the whole economy. The average rate of return on the personal accounts from 1981 to 2004 was 10 percent per year. The increased savings associated with these accounts also contributed to an increase in the growth rate of the economy.

In contrast to this positive view, a *New York Times* article (Rohter, 2005) reports that only half of the population is covered by the plan, that people who remain with the government plan often have higher retirement income than those who switched, and that expenses have significantly impaired the investment performance of the personal accounts.

As policy makers and employers look to improve outcomes for U.S. workers, the Chilean experience reinforces several of the suggestions for implementation discussed earlier in this paper.

The lessons for the U.S. are that change entails the possibility of ex-post regret, as discussed in section V; and that expense ratios matter, as discussed in the same section. As policy makers and employers look to improve outcomes for U.S. workers, the Chilean experience reinforces several of the suggestions for implementation discussed earlier in this paper.

NOTES

1 In the UK, these plans are called "final salary plans."

2 The University of Missouri system uses the average of the highest five consecutive years as the baseline. For most people, this is the last five years of employment, but it need not be.

3 There may or may not be guaranteed cost-of-living adjustments. If there are, the initial yearly payment might be less than $37,500.

4 The 403(b) is the nonprofit equivalent of the 401(k), and the Roth 403(b) is the nonprofit equivalent of the Roth 401(k).

5 The reasoning below applies to the comparison of a normal and a Roth IRA, as well as to the comparison of a 401(k) and a Roth 401(k).

6 A few examples of this "political economy" story from the (semi-)private sector also exist. For example, according to Osorio and Vernuccio (2009), the UAW (whose DB plan is distinctly underfunded) supported health care reform in exchange for legislation changing the rehabilitation and funding improvement periods for plans in critical status. Their article can be found online: tinyurl.com/nsuebh

7 Many public-sector DB plans are more generous than typical private-sector DB plans.

8 The present value is the amount of money that would be needed today to pay off promised benefits in the future. The discount rate is the rate of return that can be earned on the money until it is paid out.

9 Recall, however, that there may be a tradeoff between contributions and salary levels.

10 One objection to the opt-out approach is that the expense ratios (see discussion below) of the alternatives chosen by the employer can be too high (Klein, 2009). But this is not truly an objection to the opt-in decision per se; instead, it is a legitimate objection to the choice of investment alternatives. Mutual funds and other vehicles with very low expense ratios are widely available.

11 Obviously, this does not apply to the nonprofit or public sectors.

12 Financial economists would say that the person's salary and the investment in company stock are "highly correlated."

13 It is worth noting that if a substantial number of employees participate in a company-contributory plan, the company might reduce its contribution. This would reduce the effectiveness of the opt-out policy.

14 Note, however, that such a policy reduces the freedom of employers.

15 A contrary view comes from Laurence Kotlikoff, a professor of economics at Boston University. He states that "the only safe investment that people should be defaulted into are Treasury Inflation-Protected Securities" (quoted in Klein, 2009).

16 For more detail, see Ezra, Collie, and Smith (2009), chapters 12, 13, and 14.

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