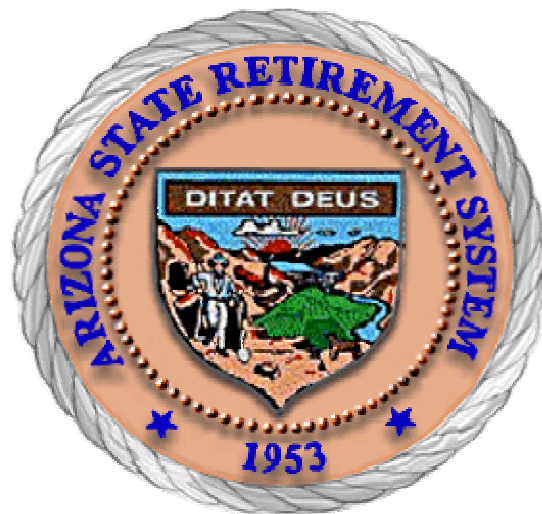


Arizona State Retirement System



**A Comparative Analysis
of
Defined Benefit and Defined Contribution Retirement Plans**

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Executive Summary

In very broad terms, there are two types of retirement plans that employers may offer to their employees: defined benefit plans and defined contribution plans. Defined benefit plans typically provide a stable lifetime retirement income stream to a retiree, whereas defined contribution plans typically provide a lump-sum value to a retiree, with the retiree determining how to create an appropriate retirement income stream.

Both types of retirement plans are under examination today, both across the United States, as well as in other countries. This examination is occurring in the private sector as well as the public sector, and is occurring among public and private executives, legislators, pension administrators, and citizen groups. While there is much discussion on both sides regarding which is the “better” plan structure – defined benefit or defined contribution – a more detailed analysis of the advantages and disadvantages of the two plan structures will provide decision makers with better information from which to make decisions. Our research suggests that the various characteristics of defined benefit and defined contribution plans can be grouped into five broad categories:

- 1) Plan Costs
- 2) Risks
- 3) Investment Returns
- 4) Plan Management
- 5) Specific Government Plan Considerations

Each of these five categories as well as the relevant sub-categories is discussed in the subsequent sections of this paper.

Contextual Preamble

We believe that it is important to understand the context within which this paper was developed. Such contextualization is important to any reader, because if the contextual description is accurate, it allows the reader to focus on the document’s statements and conclusions, rather than trying to determine the author’s objectives. Specifically, this paper was developed with the following five objectives and constraints:

➤ Informative

The paper is not designed to advocate. Rather the purpose is to inform. Each reader should be able to obtain factual information from the paper that will assist them in determining what retirement program structure is optimal for their particular circumstance.

➤ Unbiased

The paper is designed to be unbiased. No ideology or ideological values are expressed nor are the logic or fact statements intended to be supportive of any ideological perspective. Both the advantages and disadvantages of various plan designs are discussed.

➤ Rational

The paper is designed to be rational in its structure, presentation, and conclusions. The rational paradigm is fundamentally economic, but also includes sociological and psychological references. Value inferences are not made.

➤ Substantially Exhaustive

The paper is designed to be substantially exhaustive so that a detailed literature review is not required. Substantiality in this context refers to the magnitude and relevance of the various decision factors for plan design.

➤ Useable

The paper is designed to be a useable document. It combines theoretical arguments with pragmatic considerations. It is designed to be a practitioner's and policy-maker's guide to decision-making for retirement plan design.

We believe that the above five objectives and constraints are appropriate, as it is illogical to attempt to force a particular plan design in a situation for which it is ill-suited. Rather, rational decision-makers and participants should come to conclusions with respect to which type of plan design is likely to meet the desired outcomes, based upon facts and logic that are not ideological driven or constructed.

Issue

Recent increases to the aggregate contribution rate levels paid by both employees and employers to their defined benefit plans has been a significant factor leading to numerous discussions concerning the various advantages and disadvantages of defined benefit and defined contribution plans. The increases in contribution rates, have generally resulted from the following five factors:

- 1) significant improvements to the retirement benefits that occurred prior to 2002;
- 2) low contribution rates during the 1990s;
- 3) lower investment returns during fiscal years 2001, 2002 and 2003;
- 4) improving life expectancies of retirees; and
- 5) expensive and ineffective plan design features¹.

Numerous publications have discussed the merits of both defined benefit plans and defined contribution plans. Discussions have lead to divergent and often inconsistent approaches, including both defined benefit and defined contribution plan terminations; creating tiered defined benefit plans that allow existing *participants* and retirees to remain in the plan that they are currently in while offering new employees a defined benefit plan with reduced benefits; and creating hybrid plans. Each of these approaches has advantages and disadvantages.

This paper provides an analysis of the costs, risks, returns, plan management, and specific government plan considerations of defined benefit and defined contribution plans, and considers both the advantages and disadvantages of the two types of plans with respect to each attribute.

¹ These include such features as allowing service purchases to occur at below market rates, enhancing refund options for non-retiring employees, allowing options that were not fully priced, allowing options in which selection bias could occur, as well as numerous other features.

Analysis of Defined Benefit & Defined Contribution Plan Characteristics

1. Plan Costs

Plan costs refer to the various fees, expenses, and other negative cash flows that either increase the costs of managing the plan, or decrease the rates of return that can be achieved by the plan. There are two broad groups of plan costs: Investment Costs and Administrative Costs. From the perspective of both the plan sponsor as well as the members, costs are a negative attribute only.

Investment Related Costs

Investment related costs refer to the overall costs involved in managing a portfolio of securities. With respect to defined benefit plans, these costs typically consist of segregated and commingled fees and expenses that are negotiated by the plan sponsor, and typically vary according to the asset class involved, the management style utilized, and the size of assets under management. With respect to defined contribution plans, these costs typically consist of mutual funds management expenses (and in smaller plans possible front and rear loads or sales charges) and also typically vary according to the asset class involved, the management style utilized, and the size of assets under management. Mutual fund investment fees depend on the fund selected, with typical investment expense ratios for a retail active stock mutual fund of approximately 1.25% of assets, and typical retail active bond fund investment expense ratios of approximately 0.75% of assets. Institutional mutual fund fees for defined contribution funds can be significantly lower, but are still typically higher than investment fees paid by large defined benefit plans. As a result, defined benefit plans generally have lower costs per unit of benefit than defined contribution plans. This is primarily due to the fact that defined benefit plans aggregate the funds of hundreds of thousands of employees and are therefore able to receive significant reductions in their investment costs through economies of scale. For small plans, defined benefit costs can be higher than those of defined contribution plans as costs of defined contribution plans tend to increase almost linearly with the number of participants, while defined benefit plan costs, beyond a certain size, increase much more slowly because of pooling.

Administrative Related Costs

Administrative related costs refer to the overall costs involved in administering the accounts of the member. With respect to defined benefit plans, these costs typically consist of the various salaries, rent and overhead related to the administration, accounting, recordkeeping, custody services, information processing, education and information dissemination that is required to collect, account and pay the various benefits. These costs can be paid for either from the investment assets or from a separate appropriation. For the ASRS, these costs are paid from the assets. For public defined benefit plans, the services related to these costs are typically performed by a combination of public and private employees.

With respect to defined contribution plans, these costs also typically consist of the various salaries, rent and overhead related to the administration, accounting, record keeping, custody services, information processing, education and information dissemination that is required to collect, account for and pay the various benefits. These costs can be paid either from the assets or from a separate appropriation. For defined contribution plans, the services related to these costs are typically outsourced and performed by private employees. Offering individual investment choices necessitates the maintenance of individual accounts that are usually updated daily and made accessible to the participant.

In a review of 12 of the nation's largest defined benefit plans, which provide coverage for more than one-third of all active state and local government employees, the average annual expense ratio was .25%, which includes both investment and administrative costs.² These fees are part of the contribution rate and are not charged separately to participants' accounts. Further data on these costs can be found in a research memorandum published by Gabriel, Roeder, Smith & Co., which states, "Per dollar of benefit paid, it is less expensive to provide benefits through a defined benefit plan than through a defined contribution plan."³

² Anderson, Gary W. and Brainard, Keith, (November 2002, updated February 2005), Myths and Misperceptions of Defined Benefit and Defined Contribution Plans, *National Association of Retirement Administrators*, pg. 15.

³ Murphy, Brian, Sonnanstine, Alan, and Zorn, Paul, (November 17, 2003) List of Advantages and Disadvantages for DB and DC Plans, *Gabriel, Roeder, Smith & Company (GRS) Research Memorandum*.

Combined investment and administrative fees paid by participants in smaller defined contribution plans can exceed 2% and have a direct and substantial impact on the assets available to the participant.⁴ Table I below demonstrates the lower assets available to pay benefits based upon six different fees levels ranging from 0.25% - 1.50% based upon a lump-sum investment held for a 15-year period. It demonstrates that a plan cost structure of 1.00% would reduce a participant's 8.25% expected investment return to 7.25%, which when compounded over 15 years would reduce the accumulation of assets by approximately 10% versus a defined benefit cost structure, and therefore significantly reduce the benefits that can be paid from the account. This difference is magnified for longer periods of time and for greater cost differentials, and lessened for shorter time periods or if costs differentials can be reduced.

Table I

Combined Investment and Administrative Fees Analysis: Effect on Net Returns and Final Asset Base Available for Retirement		
Combined Fees - %	Net Returns - %	Reduced Asset Base - %
0.25	8.00	0
0.50	7.75	3
0.75	7.50	7
1.00	7.25	10
1.25	7.00	13
1.50	6.75	16

Assumptions:

Gross-of-Fee Returns: 8.25%

Benchmark Defined Benefit Fee Structure: 0.25%

In general, it is reasonable to estimate that large defined benefit plans have aggregate costs which are approximately 0.5% of assets per year lower per unit of benefit than defined contribution plans, resulting in an asset base available for retirement that, assuming similar returns would be approximately 7% smaller for defined contribution plans than for defined benefit plans. This 7% reduction estimate only takes into consideration the typically higher investment and administrative cost structures of defined contribution plans, and does not take into account the lower investment returns typically achieved by defined contribution plans.

⁴ Anderson, Gary W. and Brainard, Keith, Myths and Misperceptions of Defined Benefit and Defined

The combined higher costs structure and lower investment returns of typical defined contribution plans would result in a significantly greater reduction in asset base available for retirement than the 7% described above.

2. Risks

Investment Risk Transfer

Defined benefit plans are structured in such a manner that the employer assumes a portion (or all) of the investment risk, whereas defined contribution plans are constructed in such a manner that the employee assumes virtually all of the investment risk. As a result, defined benefit plans result in contribution rates that fluctuate through time in order to offset investment gains and losses, while maintaining a static post-retirement benefit structure. This is different in a defined contribution plan, where the participant has the option of either forcing their personal contribution rate to fluctuate or changing their expected post-retirement benefit structure to offset investment gains and losses.

Assuming that both employees and employers are on average *risk averse*, defined benefit plans tend to split investment risk between employers and employees,⁵ while defined contribution plans tend to place the entire investment risk with employees.

Although it appears that the investment risk issue is related purely to incidence, it is actually related to both incidence as well as magnitude. This risk magnitude issue is discussed in the next section, “Investment Diversification.”

Investment Diversification

Investment risk is related not only to incidence, but is also related to magnitude. Specifically, the magnitude of the investment risk issue is significantly determined by the diversification strategies available to the plan members or participants. These diversification strategies are in turn related the investment universe available to defined benefit plans versus defined contribution plans. Although it may appear *a priori* that the investment universe is identical for both types of plans, this is not the case. Due to numerous factors including:

Contribution Plans, pg. 15.

⁵ Private sector defined benefit plans typically absorb the investment risk entirely, whereas public sector plans tend to split the investment risk between the employee and the employer.

regulatory requirements, management requirements, infrastructure requirements, dollar size requirements and cash flow ‘*lumpiness*,’ the defined benefit investment universe is notably more expansive than the defined contribution investment universe. In particular, defined benefit plans are able to invest in the following investment areas that are generally not open to defined contribution participation: private real estate; private equities; commodities; and venture capital, as well as other alternative investments. As a result, the *efficient frontier* for a defined benefit plan is expanded beyond that available for defined contribution plans.

As a result of the above investment universe differential, defined benefit plans should be able to achieve similar returns to defined contribution plans with less risk.

Demographic Risk Transfer

Defined benefit plans are structured in such a manner that the employer and the aggregate body of employees share the demographic risk, whereas defined contribution plans are constructed in such a manner that the employee assumes the demographic risk.⁶ As a result, defined benefit plans result in contribution rates that fluctuate through time in order to offset changes in demographic experience, while maintaining a static post-retirement benefit structure. This is different in a defined contribution plan, where the participant has the option of either forcing their personal contribution rates to fluctuate or changing their expected post-retirement benefit structure in order to offset personal demographic experience.

Assuming that both employees and employers are on average risk averse, defined benefit plans tend to split demographic risk between employers and employees, while defined contribution plans tend to place demographic risk entirely with employees.

Post Retirement Income Stability Risk

Defined benefit plans are typically structured in such a manner that the post-retirement income stream is a fixed amount based on some combination of salary, years of service, and a multiplication factor, whereas defined contribution plans are structured such that the post-retirement income stream is unknown at least until retirement, and possibly also during retirement. As a result, the post-retirement income stream is essentially the same (*uni-*

⁶ This is typically true of government defined benefit plans only. In most private sector defined benefit plans, the employee does not share such demographic risk as they do not make contributions to the plan.

modal) for similar individuals under a defined benefit plan, but is significantly more varied (*platykurtic*) for similar individuals in defined contribution plans. The result is a more even distribution of post-retirement income for defined benefit plans and a much less even distribution of post-retirement income for defined contribution plans. A social value metric would be needed in order to determine whether a large or small standard deviation of post-retirement income streams is preferred, and to therefore determine whether a defined benefit or defined contribution plan offers the appropriate distribution of financial results, but it is clear that post-retirement income is more stable among defined benefit plan members than it is among defined contribution plan participants.

Financial Planning Risk

Defined benefit plans are designed to provide a fixed, stable, and known post-retirement income level, whereas defined contribution plans do not allow for such stability unless a typically low-yielding fixed income investment is utilized. As a result, financial planning issues and concerns are typically easier to plan for and resolve for defined benefit plan members than for defined contribution plan participants. Greater emphasis on financial planning can mitigate the uncertainty around post-retirement income levels in defined contribution plans, but they can not eliminate the uncertainty. Also, the additional required focus on financial planning that defined contribution plans engender are costly to their participants in terms of both financial expenses as well as time allocation.

An additional financial planning risk that is typically absent from defined benefit plans but exists with defined contribution plans is the savings risk. This risk results from the fact that defined benefit plans require an employee, or employer in private sector plans, to save for the employee's retirement, whereas in defined contribution plans there are no such required savings. As a result, defined benefit members are more likely to accrue adequate retirement income than are defined contribution participants.

3. Investment Returns

Asset Allocation Expertise

Defined benefit plans require the sponsor or an engaged third party to make the most critical investment decisions – referred to as asset allocation decisions – whereas in a defined

contribution plan the individual participant is typically required to make the asset allocation decisions. Specifically, in defined benefit plans, the sponsor will engage a series of experts to determine an appropriate asset allocation – utilizing a combination of quantitative, empirical, and theoretical analysis – that is expected to achieve the greatest unit of return per unit of risk. Defined contribution plans require participants to self direct an investment strategy, usually utilizing a variety of mutual funds or possibly individual securities through what is known as a brokerage window. In order to partially mitigate participant risks inherent in defined contribution plans in this area, many defined contribution plans now provide a series of specific investment options called lifestyle funds that are intended to make these critical asset allocation decisions for the participant. This mitigates the potential risk to the participant; however the participant must still actively choose to outsource the asset allocation decision to the particular vendor in order to achieve this risk mitigating benefit.

As a result of the asset allocation decision making process described above, the individual participant in a defined contribution plan assumes the largest and most critical risk for producing a return on his account sufficient to fund his retirement benefits, often utilizing a personal non-expert skill set. Participants who excel at investment management may directly benefit from returns that exceed market averages, whereas participants who do not excel at investment management and do not utilize a risk appropriate lifestyle fund may be directly harmed from returns below market averages.

Empirical evidence indicates that the professional investment management provided by defined benefit plans has consistently provided higher rates of return than those of defined contribution plans. Although participants with sophisticated knowledge of investments may produce gains in their individual accounts, studies have shown that the average participant is a passive investor and receives rates of return significantly below those of DB plans. A study by Buck Consultants on the Nebraska Retirement System in 2000 found a highly significant difference in the returns from 1983-1999: the defined benefit plan averaged an 11% return and the defined contribution plan averaged 6% return.⁷

⁷ Slishinsky, David, EA, MAAA, Buck Consultant, (2000) Actuary for the Nebraska Retirement Systems who authorized the 2000 Study which supported the change from Defined Contribution Plans to Cash Balance Plans.

As a result of the greater asset allocation financial expertise that is typically utilized in defined benefit plans, defined benefit plans are able on average to obtain higher rates of return than defined contribution plans.

Age Dependency

Due to the *going-concern* nature of defined benefit plans, as well as their membership age diversity, the typical defined benefit plan is able to retain an investment *risk profile* that is relatively independent of individual aging, whereas the individual nature of a defined contribution plan requires the individual participant to modify their investment risk profile based upon age-specific characteristics. As a result, defined benefit plans typically allow for an investment structure that has a higher risk/return tradeoff and subsequently can reasonably be expected to obtain higher returns than a defined contribution plan.

4. Plan Management

Portability

Defined benefit plans enable members to transfer the full accumulated account balances when they move from employer to employer, but these account balances do not typically reflect the full value of employer contributions. Defined contribution plans enable participants to transfer the full accumulated account balances when they move from employer to employer, which includes the full value of both employee and employer contributions. As a result, defined contribution plans typically allow a larger percentage of the available money to move with employees as they move from employer to employer, potentially increasing the balances available to the more mobile employees upon retirement.

Administrative Complexities

Defined benefit plans rely on a combination of assumptions that include longevity, turnover, retirement ages and investment returns. As time passes, each of these assumptions will deviate from expectations, causing plan funded status and contribution rates to diverge from expectations. In addition, the intrinsic complexities of defined benefit plans lead to a greater possibility of plan design feature decisions being made without a full understanding

of all the various implications. As a result, defined contribution plans tend to be easier to administer and have greater financial certainty for employers.

Member Empowerment

Defined benefit plans operate virtually independently of the employees financial decisions, whereas the success of defined contribution plans substantially depends on active participation and engagement of employees. Consequently, employees of defined contribution plans may feel a greater sense of empowerment with their ability to affect their future financial security. It should be noted, however, that this sense of financial empowerment has a significant risk for the employee, in that even if they properly plan, save, and invest, they may have an insecure retirement future.

Contribution Rate Volatility

Contribution rates to a defined benefit plan are based on actuarial valuations and as a result the rates will fluctuate from year to year as a result of such factors as investment returns and plan experience being different from actuarial projections. The periodic change in rates can reasonably be expected to be difficult for both employees as well as employers to plan and budget for. Defined benefit plans can mitigate contribution rate fluctuations by utilizing various approaches including: careful management of asset allocations, smoothing investment returns, utilizing forward looking actuarial assumptions, managing benefit administration and utilizing less period-sensitive actuarial methodologies.

Contribution rates to a defined contribution plan are determined in the plan document and once set are constant unless the document is changed. For this reason, many employers have established profit sharing defined contribution plans instead of a standard 401(k) plan. The mandatory employer contributions to a defined contribution plan must be made without regard to the financial condition of the employer, but are known in advance and not dependent upon investment returns or actuarial assumptions.

Contributions to defined contribution plans have the advantage of being both stable and known, whereas contributions to defined benefit plans will almost certainly fluctuate through time, often quite significantly.

Demographic Diversification

Defined benefit plans are designed in such a manner that they are diversified on two demographic axes on which defined contribution plans are not. First, defined benefit plans are cross-sectionally diversified in a fashion similar to life insurance companies. As a result, the particular mortality characteristics of an individual will not require modification of investment strategy as is the case with defined contribution plans. In addition, defined benefit plans have time series diversification, which allows for inter-generational member diversification. As a result, the particular demographic characteristics of an individual will not require the modification of investment strategy that would be required with a defined contribution plan.

Residual Plan Management

Residual plan management refers to the various issues and complexities that result from managing a retirement plan after it has been closed. Such legacy retirement plans have various issues that should be addressed prior to their closure. In general, defined benefit plans have a multitude of significant and complex issues that arise upon plan closure, whereas defined contribution plans have significantly fewer and less complex issues that must be addressed upon plan closure. As a result, defined benefit plans have a disadvantage compared to defined contribution plans when being implemented in that any future closure of the defined benefit plan will likely be significantly more problematic.

In particular, closing a defined benefit plan has consequences in each of the following areas: allocation of unfunded liabilities; volatility management of contribution rates; multi-plan administrative complexities; and human resource morale issue. With respect to the allocation of unfunded liabilities, the closed plan will be required to allocate this accrued deficit among a static or decreasing employee base because there will not be any new entrants into the plan. As a result, the remaining employees can reasonably be expected to have the same normal cost component, but an increasing amortization component to their retirement contribution rates, resulting in a higher overall level of future contributions for the remaining plan members. With respect to the volatility of contribution rates, the static or decreasing employee base in the closed plan will increase the volatility of contribution rates both for plans with an unfunded accrued liability as well as for plans with an accrued surplus. As a

result, the remaining employees and/or employers can reasonably be expected to have significant increased volatility in their required contribution rates.

With respect to multi-plan administrative complexities, the various administrative and investment management functions would need to be performed for two plans, each utilizing very different infrastructures and platforms. As a result, the administrative and investment management cost burdens would reasonably be expected to increase.

Finally, providing a defined benefit plan to one set of employees and a defined contribution plan to another set of employees would reasonably be expected to result in potentially significant morale issues. The two different plans could be perceived as offering different levels of benefits to different employees. This could be perceived as an old versus new employee differential treatment issue, or it could be perceived as an inter-generational differential treatment issue. In either case, it could reasonably be expected that morale would be negatively affected. Organizations with average or above-average turnover rates should specifically consider any possible morale consequences of offering two different plans with perceived benefit differences.

Member Reception

Both defined benefit plans and defined contribution plans have a number of positive attributes for both employees and employers, and offer specific advantages under different circumstances and in different situations. Irrespective of the various positive and negative attributes of the two general types of retirement plans, there is a relatively strong body of knowledge that indicates that employees who have a defined benefit plan view a conversion from a defined benefit structure to a defined contribution as significantly negative. Empirical evidence in numerous states, counties, and municipalities across the country indicates that the support for defined benefit conversions or closures among employees is extremely low. When given a choice to migrate from a defined benefit plan to a defined contribution plan, very few public employees have chosen the defined contribution option. Specifically, when offered the choice between a defined benefit plan and a defined contribution plan, research

data indicates that approximately 95% of the employees have chosen to stay with the defined benefit plan.⁸

Education

There is a significant differential in the level of education that is typically required for members of a defined benefit plan versus participants in a defined contribution plan. Specifically, since defined benefit members are not making investment decisions, they do not need significant financial planning skills to manage the defined benefit component of their retirement plan. Defined contribution plan participants do, however, require quite significant financial planning skills to manage the defined contribution component of their retirement plan. With respect to education, it is also important to note that studies indicate that employers and administrators have a difficult time in effectively educating and advising defined contribution participants. This is potentially a significantly negative aspect of defined contribution plans that requires ongoing attention.

5. Specific Government Plan Considerations: Defined Benefit Plans

There are a number of areas in which public sector defined benefit pension plans have both modest absolute advantages over private sector defined benefit pension plans, and significant comparative advantages over private sector defined benefit pension plans. It is important to appreciate these advantages, as appropriate application of the advantages they should result in more cost effective human resource management by government entities. There do not appear to be any significant areas in which private sector defined benefit plans have either absolute or comparative advantages over public sector pension plans. The four areas of absolute and comparative advantages are as follows.

Economic Alignment of Interests

Government sponsors of defined benefit plans typically have an alignment of economic interest that does not exist in most private sector plans. Specifically, private sector defined benefit plans, with the exception of grandfathered defined benefit plans which can

⁸DB/DC Fact Sheet, *Overview of Plan Types and their use among Statewide Retirement Systems*, National Association of State Retirement Systems, pg. 2.

allow for employee contributions, are typically funded 100% by employer contributions, whereas public sector plans are typically funded both by the employee and employer. As a result, there is an automatic alignment between the employee and the employer with respect to the plan's cost structure, benefit structure, and risk profile in government defined benefit plans (especially those in which the employee contribution rates are variable) that is non-existent in most private sector plans.

Employer Going-Concern Status

The going-concern nature of most government sponsors significantly reduces, and possibly eliminates, the worst case default scenario that exists in the private sector. This is a significant differentiating issue for government sponsors, as it represents a major risk area for private sector defined benefit plan participants. Even with Federal Pension Benefit Guaranty Corporation (PBGC) guarantees discussed below, private sector defined benefit members have significant default risks that fundamentally do not exist for public defined benefit plans and their members. Attempts to reduce the default-risk in private sector funds, including those in the "2006 Pension Protection Act", typically increase both the volatility of contribution rates as well as the volatility of corporate cash flows.

Cross-Employer Liability Risk

Private sector defined benefit plans are legally bound to participate in a federal guaranty program, referred to as the Pension Benefit Guaranty Corporation, and as a result must make insurance premium payments to the PBGC based upon the number of participants in the plan as well as the risk classification of the plan. The results of this are three fold: first, it increases the cost structure of the defined benefit plan; second, it forces well managed private sector plans to pay insurance premiums based on the risks of other, possibly less well managed plans; three, it results in a mild form of moral hazard for the private sector defined benefit pension plan industry. Public sector plans do not participate in such guarantee plans, and therefore have both a modest cost advantage over private sector sponsors, in addition to not incurring cross employer liability risk that is mandated in the private sector.

Actuarial Flexibility

Public sector defined benefit plans have a number of advantages over their private sector counterparts in the area of actuarial flexibility. Specifically, private sector defined benefit plans are subject to what is known as liability valuation risk – forcing the plans to change their liabilities periodically based upon interest rate levels rather than any intrinsic plan factors or long-term rate of return assumptions. The result is significantly greater volatility in contribution rates in private sector defined benefit plans.

In addition, private sector defined benefit plans are subject to what is known as asset ‘mark-to-market’ risk – the process of forcing the plan to recognize the changing value of its assets over short periods of time based upon current market circumstances, rather than allowing the smoothing of gain and loss recognition. The result will again be significantly greater volatility in contribution rates in private sector defined benefit plans.

In general, public sector plans have significantly greater ability than private sector plans to modify the fluctuations in contribution rates.

Table 1
Plan Strength Summary Matrix

Plan Characteristics	Defined Benefit Plans	Defined Contribution Plans
Plan Costs		
1. INVESTMENT RELATED COSTS	+	
2. ADMINISTRATIVE RELATED COSTS	+	
Risks		
3. INVESTMENT RISK TRANSFER	+ EE	+ ER
4. INVESTMENT DIVERSIFICATION	+	
5. DEMOGRAPHIC RISK TRANSFER	+	
6. POST RETIREMENT INCOME STABILITY RISK	+	
7. FINANCIAL PLANNING RISK	+	
Investment Returns		
8. ASSET ALLOCATION EXPERTISE	+	
9. AGE DEPENDENCY	+	
Plan Management		
10. PORTABILITY		+
11. ADMINISTRATIVE COMPLEXITIES		+
12. MEMBER EMPOWERMENT		+
13. CONTRIBUTION RATE VOLATILITY		+
14. DEMOGRAPHIC DIVERSIFICATION	+	
15. RESIDUAL PLAN MANAGEMENT		+
16. MEMBER RECEPTION	+	
17. EDUCATION	+	
Plan Characteristic Totals = 17	12	6

Conclusion

There are both positive and negative attributes of defined benefit and defined contribution plans and there is no single best solution for all circumstances. Rather, each of these attributes should be considered in the context of the specific fiscal, operational, human resource, and social circumstances of the employees and employers.

What do appear to be generalized observations about medium and large defined benefit plans and defined contribution plans are:

1. Plan Costs: Defined benefit plans appear to be notably less expensive per unit of benefit than defined contribution plans.
2. Risks: Defined benefit plans appear to be able to provide less risk than defined contribution plans.⁹
3. Investment Return: Defined benefit plans appear to achieve notably greater returns than defined contribution plans.
4. Plan Management: Defined benefit plans and defined contribution plans each offer a unique set of management issues with defined contribution plans being more simple to administer, but without a clear advantage to either.
5. Government authorities have notably different structures, characteristics, environments, and flexibilities in a number of areas that provide them with both absolute as well as comparative advantages in offering defined benefit plans.

If the goal of a retirement plan is to provide the least expensive method of providing a basic guaranteed replacement income to the members, then the defined benefit plan appears to provide a significant advantage for the majority of participants if the plan choices are mutually exclusive. If the plan choices are not mutually exclusive (and they are not), then it appears that the most appropriate strategy may be to provide a balanced approach with a defined benefit plan as the primary income replacement vehicle and a defined contribution plan option such as 457, 403(b), or Supplemental Retirement Savings Plan, to provide an

⁹ Although the level of risk is lower with defined benefit plans, this lower risk level resides partially (or wholly with most private defined benefit plans) with the employer, whereas in defined contribution plans virtually none of the higher risk resides with the employer.

additional but discretionary option for additional pre tax retirement savings with no additional cost requirements for the employer.

Definitions

Absolute Advantage: An advantage that accrues to an entity because it is able to produce an outcome with less resource requirements than another entity.

Administration Fee: A fee that is customarily paid for by employee as an annual deduction from their account. These fees may be high if it is a new plan and reduced or eliminated as the account balances increase.

A priori: An expectation based upon logic but made in the absence of research or statistical evidence.

Comparative Advantage: An advantage that accrues to an entity because it is able to produce an outcome with less relative resource requirements than another entity.

Diversification: Spreading of risk by putting assets in several categories of investments – stocks, bonds, money market instruments, and precious metals, for instance, or several industries, or a mutual fund, with its broad range of stocks in one portfolio.

Efficient Frontier: The set of portfolios on the minimum variance frontier, but with maximum expected return for each given level of standard deviation.

Going-Concern: The idea that a company will continue to operate indefinitely, and will not go out of business and liquidate its assets. For this to happen, the company must be able to generate and/or raise enough resources to stay operational.

Lumpiness: An uneven and typically unpredictable distribution of cash flows.

Member: An individual in a defined benefit plan.

Participant: An individual in a defined contribution plan.

Platykurtic: Describes the relatively flat condition for a distribution. This condition is evaluated against the normal distribution and its attendant bell-shaped curve.

Risk Averse: Term referring to the assumption that, given the same return and different risk alternatives, a rational investor will seek the security offering the least risk – or, put another way, the higher the degree of risk, the greater the return that a rational investor will demand.

Risk Profile: The degree to which various risks are important to a particular investor.

Uni-Modal: A distribution that has one most frequently occurring value.

References

Actuarial Valuations of June 30, 2006, for Arizona State Retirement System, Public Safety Personnel Retirement System, Arizona Corrections Officer Retirement Plan, the Arizona Elected Officials Retirement Plan, The City of Phoenix Employee Retirement System and the Tucson Supplemental Retirement System.

Anderson, Gary W. & Brainard, Keith, (November 2002, updated February 2005), *Myths and Misperceptions of Defined Benefit and Defined Contribution Plans*, National Association of Retirement Administrators.

DB/DC Fact Sheet, *Overview of Plan Types and their use among Statewide Retirement Systems*, National Association of State Retirement Systems.

Murphy, Brian & Sonnanstine, Alan & Zonr, Paul, (November 17, 2003), *List of Advantages and Disadvantages for DB and DC Plan Research Memorandum*, Gabriel, Roeder, Smith & Company (CRS).

Slushinsky, David, EA, MAAA, (2000), *Nebraska Retirement System 2000 Study*, Buck Consultants.

Other Materials or People Referenced

Allen, Melone, Rosenbloom, VanDerhei, (1997, Eighth Edition) *Pension Planning – Pension, Profit Sharing and Other Deferred Compensation Plans*.

Anderson, Gary W. & Brainard, Keith, (2004). *Profitable Prudence: The Case for Public Employer Defined Benefit Plans*, Pension Research Council Working Paper, The Wharton School, University of Pennsylvania.

Bartlett, Laura, Vice President, Putnam Investments (March 2006).

Mandel, Harry, Actuary for West Virginia Teachers Retirement System, *study that resulted in the closing of the defined contribution system and creating a defined benefit plan.*

Morris, William, CIO, Fire and Police Pension Association of Colorado

Sean Collins, (December 2003, Vol. 9, No. 6) *The Expense of Defined Benefit Pension Plans and Mutual Funds*, Perspective - Investment Company Institute Newsletter.