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Design considerations for large public sector defined contribution plans☆

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Abstract

The paper identifies differences between private (401 (k)) plans, which have evolved under ERISA and existing public plans, which have not. Examination of model legislation reveals that public plans should largely conform to ERISA going forward and reflect best practices in the private sector. Empirical analysis of equity mutual funds with $1.8 trillion in assets and institutional equity accounts with $98 billion in assets demonstrates efficiencies in separately procured institutional investment, administrative and educational services relative to retail investment products. The analysis points to tension between the duties of trustees and the demands of participants requesting large numbers of retail investment options.

Jel classification: G23; G28; H55; H72; J26

1. Introduction

The public sector increasingly uses defined contribution (DC) pension plans, either as supplement or in place of the more traditional defined benefit (DB) pension plans. Optional DC programs have been in place for a number of years for public university faculty, but in recent years a number of large public employee retirement systems have adopted or are in

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the process of implementing DC arrangements (e.g., Michigan, Colorado, Washington, Louisiana, Florida, Montana, Ohio, and South Carolina). Moreover, proposed Social Security reforms that would introduce self-directed accounts are essentially federal DC accounts. Thus, investment policy issues unique to public sector DC plans are important and timely.

There is little literature exploring the special circumstances of public sector DC plans and thus no clear enunciation of best practices. However, there are apparent differences in the organization and administration of public and private sector DC plans. The purpose of the paper is to address the policy issues encountered in the design of large public sector DC programs.

Many corporate DC plans, which have evolved under the Employee Retirement Income Security Act (U.S. Department of Labor, 1974), utilize an institutional approach where services are unbundled; that is, trustees contract separately for components of investment advisory, educational and administrative services. Morgan Stanley (1999) reports that of 375 401(k) plans surveyed in 1999, about half of the programs purchased unbundled investment products and administrative services and more than half of the programs offered some institutional (nonretail) investment products to their participants. Another survey reported that 80% of 401(k) plans with more than 10,000 participants were at least partially unbundled in 1999 (BARRA RogersCasey/IOMA, 1999). This has the impact of minimizing plan expenses and increasing participant benefits. Generally such plans are consistent with Modern Portfolio Theory (MPT) and offer limited investment options. It is not unusual to find index funds in such plans.

In contrast, public DC plans have evolved without the benefit of ERISA. Enabling laws and statutes are unique to each state. Such plans often lack a trustee governance structure and commonly utilize a bundled investment architecture where vendors provide investment advisory, educational and administrative services under one umbrella fee. Vendors in this sector include Variable Annuity and Mutual Fund companies and fees are often higher than the fees of unbundled DC plans. It is common to find multiple competing vendors in the same plan, negating some of the advantages of economies of scale and sometimes engendering conflicts of interest among vendors (Jacobius, 2000). Public plans typically have dozens and sometime hundreds of different investment options (KPMG, 1999; National Association of Deferred Compensation Administrators (NADCA), 1998).

Trustees of new public DC pension programs, including potential Social Security reforms, must ultimately choose between the two approaches or implement a hybrid program. The salient issues are the number of investment options available to participants and the manner in which those products and other services are procured: 1) name-branded retail investment options which bundle together investment, administrative and educational services versus 2) an unbundled procurement of private label institutional/wholesale investment options which may be independent of administrative and educational services. Other issues remain important, such as active versus passive management. However, actively and passively managed portfolios coexist comfortably in most corporate DC plans and we view this issue as outside the scope of the paper.

The issue of the number and diversity of investment options is a thorny thicket constantly faced by public sector and corporate DC trustees. Choice is commonly equated with freedom; the more the better. Thus, for plan participants, there is an intuitive appeal and

comfort that arises from the ability to choose among a broad array of branded, hence familiar, investment products. Vendors reinforce the importance of product diversity and trustees can be put in the uncomfortable position of defending design decisions with seemingly arcane academic arguments.

However, even in a theoretically pure liberal democracy, freedom is constrained to protect property rights. Similarly, trustees must critically evaluate the expected marginal costs and benefits to the overall group of participants associated with providing a diverse choice among duplicative investment products. In the main, corporate DC trustees have largely opted for a cost-effective approach that limits the investment options to a handful (i.e., 10 or less options) of relatively distinct products. Moreover, EnnisKnupp (1999) surveyed corporate plan administrators and over two-thirds of 110 respondents replied that institutional accounts are more effective than mutual funds.

We explore these issues in more depth in the body of the paper. It is organized as follows: we identify the major types of public plans, identify unique pressures on the organizers/trustees of such plans, discuss the evolving legal infrastructure underpinning public pension plans and discuss model legislation: the 1997 Uniform Management of Public Employee Retirement Systems Act (National Conference of Commissioners on Uniform State Laws, "MPERS"). We then explore the implications of MPERS for the investment/administrative design of a public DC plan and analyze a unique data set comparing the administrative and investment advisory costs associated with institutional accounts and mutual funds. Finally, we explore the implications of a hybrid approach where institutional accounts and mutual funds coexist.

MPERS and MPT strongly suggest that trustees/fiduciaries implement an unbundled institutional approach. Analysis reveals substantially greater economies of scale associated with institutional than mutual fund accounts. Further analysis reveals that a hybrid structure has serious shortcomings because it results in higher costs (lessened economies of scale) for a subset of the participants: those who choose the institutional investment options.

The higher costs associated with retail accounts significantly reduces the future benefits of participants. With an initial account value of $500 million, a 30-year horizon and annual market appreciation of 10%, large-cap mutual fund fees would lead to an account value that was $870 million lower than that produced by a large-cap institutional fund account. Further, in hybrid structures, we show that for a 10-year horizon, participants that prefer the low-cost institutional option over the higher cost name-brand options are forced to pay about 40% more in cumulative fees because assets move into the branded options.

2. First principles: trusts, trustees and fiduciary duties

Garla (1998) provides a taxonomy of public-sector tax-qualified and nontax-qualified DC plans. Section 403(b) and Section 457 Plans (designated by the Internal Revenue Code Section) are by far the most common public-sector DC-type plans. Section 403(b) Plans allow employees of state educational organizations and governmental entities to elect to have their employer make tax-deferred contributions for them to purchase an annuity contract or make contributions to a custodial account for investment in mutual fund shares. Section 457

Plans are deferred compensation arrangements, for employee contributions, that can be established by a state or other governmental entity. In 1996, Section 457 was amended so that as of January 1, 1999 all assets and income of 457 plans must be held in trust for the exclusive benefit of participants and beneficiaries. Section 401(k) Plans are available to a small number of public employers who had them adopted prior to May 6, 1986. The more recent wave of new and large public sector DC plans have been established as Section 401(a) Money Purchase Plans. In 1986, the Federal Thrift Savings Plan (a 401(a) plan), currently with $85 billion in assets, was authorized for federal employees.

As a rule, public sector retirement systems are exempt from the Employment Retirement Income Security Act (ERISA) of 1974 (Employment Retirement Income Security Act, 1974), which governs corporate 401(k) programs. Without the guiding principles of ERISA, the laws regulating public sector DC plans have evolved separately and vary significantly across states. Moreover, both DB and DC public sector retirement plans have often lagged developments in modern financial theory and practice. Garla (1998) surveys governmental retirement system law and reports the widespread legacy of statutory lists and other legal guidelines that govern permissible investments.

Legal considerations are typically ignored in the investment policy literature because ERISA has provided a legal framework. Absent ERISA, specific laws and statutes are necessary to initiate a public sector program and govern responsibilities for the design and administration of the program. Therefore, this section discusses the key legal, fiduciary and governance foundations that are necessary to establish a sound investment policy in the public sector context.

2.1. Interested parties and the political system

Besides ERISA, another difference between public sector plans and corporate plans is that interest groups routinely attempt to use the political process to enhance their well being and profitability—a phenomenon known generically as rent-seeking. Rent-seeking is not the same as lobbying activity. The latter principally communicates information on political positions to decision-makers and their staff. Such communications may include proprietary information and analysis relevant to assessing the economic impact of potential decisions. Rent-seeking is an exercise in redistributing economic resources by obtaining preferential tax, regulatory or procurement policies.

In the context of public retirement systems, rent-seeking behavior can take several forms. First, potential vendors may try to manipulate decision-makers through the statutory, budgetary or administrative law processes. Second, potential vendors have apparently established economic and financial relationships with traditional lobbying organizations, such as local government associations (e.g., Associations of Counties and Leagues of Cities), unions and professional associations (Pinkston, 2000; Jacobius, 2000). Third, some lobbying organizations, such as local government associations, may have captive money management operations. Fourth, other interest groups can be expected to lobby for economically targeted investment policies. Finally, trustees of a retirement system may face rent-seeking activity within the ranks of their professional staff, whose interests may be mis-aligned with those of participants, particularly if hiring and firing of staff is restricted by civil service laws.

The existence of interest group pressures dictate that implementing statutes must incorporate good financial and governance policy to ensure that participants and taxpayers are sheltered from the rent-seeking behavior of interest groups. Such behavior generally increases the costs of DC plans and thus reduces the eventual benefits that accrue to participants.

It is speculative to predict whether, and under what circumstances, these types of political efforts might cause public sector decision makers to take actions potentially adverse to the interests of participants. For instance, trustees are generally accomplished professionals with integrity and substance and possessing sufficient resources to help them recognize and understand their duties to participants. At the same time, the history of public sector DB plans is instructive. Political pressures have led to legal restrictions on investments (constitutional and statutory), economically targeted investments, social investments and occasional budget actions affecting contributions or plan assets (Garla, 1998; Garthwaite, 1999; Useem & Hess, 1999).

2.2. The Uniform Management of Public Employee Retirement Systems Act

Importantly, there is movement toward standardizing the legal infrastructure governing public sector plans and incorporating some of the key components of ERISA. The Uniform Management of Public Employee Retirement Systems Act ("MPERS") (National Conference of Commissioners on Uniform State Laws, 1997) develops a uniform legal framework for the administration and operation of state and local public sector DB and DC plans. MPERS sets out much of the legal infrastructure that is necessary to facilitate an effective investment policy and the balance of this section explores certain aspects of MPERS.

One of the guiding principles of MPERS (and ERISA) is the requirement that assets of retirement systems be held in trust and that trustees have the *exclusive* authority to invest and manage those assets. Further, MPERS establishes that trustees should be sufficiently independent to effectively and efficiently perform their duties. Among the exclusive powers that MPERS confers are:

> The power to establish an administrative budget sufficient to perform the trustee's duties and as appropriate and reasonable draw upon assets of the retirement system to fund the budget;
> The power to obtain by contract the services necessary to exercise the trustees' duties;
> The power to procure and dispose of goods and property necessary to exercise the trustees' powers and perform the trustee's duties.

Trustee independence is essential because it permits them to perform their duties in the face of political pressure from "interested parties." In the absence of independence, trustees may be forced to decide between fulfilling their fiduciary obligation to participants or following the suggestions of groups whose interests may not be aligned with those of the participants. The surest protection for trustees' independence is through a constitutional amendment. A supermajority requirement for future changes to trustees' powers, creates a close approximation to constitutional protection.

Of course, an independent board of trustees raises the specter of unethical behavior that

harms participants and taxpayers (self-dealing, bloated expenses etc.). The antidote to such behavior is to subject trustees to: stringent fiduciary duties and standards of care; a requirement to publish an investment policy statement consistent with those duties; a requirement to regularly report on investment performance net of fees and relative to financial market benchmarks; annual independent audits; and personal liability for any losses resulting from the breach of duties, with limited ability to shift fiduciary liability onto others.

2.3. MPERS and the prudent expert rule

The one major shortcoming of MPERS is its incorporation of a prudent person standard of care rather than the more stringent prudent expert standard embodied in ERISA and common law. The prudent expert standard requires that the retirement program's assets are invested, on behalf of the participants, with the care, skill, and diligence that a prudent investor acting in a like manner would undertake. Under this standard, if a fiduciary is not an expert, they have an obligation to obtain expert advice.

The official MPERS commentary explains that the prudent expert standard is too exacting given the diversity among existing public retirement systems. In other words, a lower standard is a legacy of existing public sector plans that evolved without ERISA standards. Invoking the lesser prudent man standard favors trustees at the expense of participants because trustee's actions are judged on the basis of how trustees in other public plans have behaved. Such behavior may not be exemplary.

The prudent expert standard applies to corporate retirement plans under ERISA and private trusts under the common law. There does not appear to be a compelling argument for a weaker standard for public sector plan participants.

2.4. Requirements for trustees under MPERS

MPERS requires that trustees must discharge their duties for the sole interest and exclusive purpose of providing benefits to plan participants and beneficiaries and defraying reasonable expenses of administering the plan. Trustees must also discharge their duties by impartially taking into account any differing interests of participants and beneficiaries, by incurring only costs that are appropriate and reasonable and in accordance with a good faith interpretation of the laws governing the program.

Fiduciaries responsible for the investment or management of retirement assets are further required to: "consider a broad range of economic and financial circumstances in establishing investment strategies, to diversify investments, to make a reasonable effort to verify facts relevant to the investment program, and may consider the benefits created by an investment in addition to investment return only if the trustee determines the investment was prudent even without the collateral benefits." Collateral benefits refer to social investing, economically targeted investing and so forth

MPERS confers an affirmative duty for fiduciaries to adopt a detailed investment policy statement that incorporates the investment objectives, the desired rates of return and acceptable levels of risk for each asset class, guidelines for the delegation of authority and information on the types of reports to be used to evaluate investment performance. MPERS

Table 1
Areas covered in 401(k) investment policy statements, 1999

	All plans	Large plans
Monitoring investment options	80%	88%
Determining type of investment options	78%	76%
Setting 401(k) plan objectives	70%	68%
Selecting investment options	67%	74%
Determining number of investment options	61%	65%
Benchmarking investment options	61%	76%
Terminating investment options	60%	65%
Amending investment policy	48%	38%
Designating roles and responsibilities	46%	56%
Plan expenses	36%	41%
Enforcing investment policy	35%	26%
Administration guidelines/requirements	31%	18%
Communication guidelines/requirements	27%	21%
Other	4%	0%
Memo: Number with Statement/Total Sample	250/446	34/56

Source: Barra RogersCasey/IOMA Annual Defined Contribution Survey. Large Plans have at least 10,000 participants.

requirements comport reasonably well with current corporate practice. Table 1 indicates the subject areas contained in the investment policy statements of a sample of 250 corporate 401(k) DC programs (BARRA RogersCasey/IOMA, 1999). This source indicates that about one-half of corporate 401(k) programs have formally adopted investment policy statements, although Chambers (1999) notes that there is no requirement under ERISA to have an investment policy statement.

DC programs are intended to be participant-directed where participants bear the risks of their investment decisions. Therefore, MPERS effectively incorporates section 404(c) of ERISA: if a participant exercises control over the assets in their account, no program fiduciary is liable for any loss to a participant's account which results from such participant's exercise of control.

To obtain this protection for program fiduciaries, participants must be given meaningful, independent control over the assets in their account with the opportunity to:

Choose from a broad range of investment alternatives that allow diversification within and among such alternatives;
Give investment instructions with a frequency that is appropriate in light of the market volatility of the investment alternatives; and
Obtain sufficient information to make informed investment decisions.

The incorporation of ERISA 404(c) is an important legal foundation in the design of a public sector DC plan. In order to obtain 404(c) protection, program fiduciaries must establish a program with investment, administrative and educational features that meet minimum standards. However, the fact that participants are in control of certain investment decisions does not relieve trustees of the duty to provide an appropriate design and conduct on-going monitoring of the program to ensure it operates as planned and remains competitive

with other alternatives. Public sector trustees have a duty to establish and maintain "best practices" in the design of a DC program. As we shall see, cost considerations are central to those decisions.

3. Public DC program objectives

Having reviewed the legal and fiduciary framework within which trustees should operate, it is relatively straightforward to identify a DC program's objectives:

1. Offer a diversified mix of low-cost investment options that span the risk-return spectrum and give participants the opportunity to accumulate portable retirement benefits.
2. Offer investment options that avoid excessive risk, have a prudent degree of diversification relative to broad market indices and provide a long-term rate of return, net of all expenses and fees, that achieves or exceeds the returns on comparable market benchmark indices.
3. Offer participants meaningful, independent control over the assets in their account with the opportunity to:
   a) Obtain sufficient information about the plan and investment alternatives to make informed investment decisions;
   b) Direct contributions and account balances between approved investment options with a frequency that is appropriate in light of the market volatility of the investment options;
   c) Direct contributions and account balances between approved investment options without the limitation of fees or charges; and
   d) Remove accrued benefits from the plan without undue delay or penalties.
4. Offer participants cost-effective administrative and educational services that will help the plan maintain compliance with U.S. Department of Labor section 404(c) regulations and provide participants with impartial and balanced information about investment choices that will help facilitate their portfolio decisions.

Most of the objectives are direct offshoots of MPERS, the prudent expert standard of care and the 404(c) requirements. Others such as portability are not controversial. However, Objective 4 deserves detailed discussion.

3.1. Impartial and balanced educational services

Corporate DC educational services have significantly evolved and expanded under recent federal regulations. Corporations were naturally averse to providing education to 401(k) participants that might later be interpreted by courts as investment advice. Therefore, in 1996, the U.S. Department of Labor promulgated Interpretive Bulletin 96–1 (IB 96–1) to encourage the provision of educational services under 404(c) of ERISA. IB 96–1 identified broad safe harbors for education, including: general financial and investment information, asset allocation models and interactive investment materials (e.g., worksheets and software).

The Department of Labor also officially stated their interest in the provision of impartial and balanced educational services. For example, to comply with the IB 96–1 safe harbors, asset allocation models and interactive investment materials must incorporate generally-accepted investment theory and disclose all material assumptions. Similarly, if interactive materials and allocation models identify specific investment products, the participant must be alerted to the existence of other substitutes and be given sources of information on those alternative products. In IB 96–1, the Department stated that their intent behind these requirements was, "to address the concern that a service provider could effectively steer participants to a specific investment alternative by only specifying one particular fund in connection with an asset allocation model."

The Department's concerns are of central importance for public sector DC plans because they are not subject to the prohibited transactions regulations of ERISA. Under such regulations, investment product providers and other fiduciaries are generally prohibited from actions that would benefit them at the expense of the participants; for example, advising a participant to choose one of their investment offerings. Therefore, unless public sector trustees take an affirmative action, in law or the program objectives, participants will not be afforded one of the basic protections enjoyed by members of corporate 401(k) programs. Unfortunately, MPERS does not invoke the prohibited transactions regulations of ERISA.

Public sector trustees have a strong incentive to arrange cost-effective educational services to help facilitate investment decisions and improve retirement benefits. First, providing impartial and balanced educational information appears to be broadly consistent with the 404(c) objective of ensuring that participants remain in control of their assets. Second, provision of even low levels of impartial educational services along the lines of IB 96–1 should entail significant increases in retirement benefits. Studies of consumer investment behavior indicate a sizeable group of consumers do not understand or follow basic investment principals related to asset allocation and cost management.[1] Moreover, the rule of thumb is that more than 90% of DC retirement benefits will be determined by an investor's asset allocation (Ibbotson & Kaplan, 2000) and every 100 basis points of excess cost lowers a DC account balance by approximately 20% over 30 years.

Trustees are also in a position to utilize the program's group purchasing power to acquire a standardized package of educational services for substantially lower cost than can be acquired by individuals at retail prices. Effectively, the long-term cost to taxpayers of a DC program should be lower per dollar of ultimate retirement benefit with relatively low educational expenditures. Of course, trustees have a duty to monitor the cost effectiveness of their chosen package of educational services, since they have a duty to incur only costs that are appropriate and reasonable.

4. Implications for general program design and procurement

The objectives imply that the selection of all program vendors must be guided by "best-in-class" principles, unless there are significant perceived advantages to purchasing products and services bundled. However, there are several compelling arguments for pursuing an unbundled architecture with separately negotiated and procured investment, admin-

istrative and education services. First, it enhances the trustees' negotiating position, as the purchasing agent for the participants. Second, it provides the opportunity for a full disclosure and review of performance and all costs borne by participants and taxpayers. Importantly, investment and administrative services are subject to different cost economics and there appears to be significantly different price structures in the retail and wholesale/institutional marketplaces (a point we empirically test below). For instance, a U.S. Department of Labor (1998) report on 401(k) costs stated:

> "Larger plans enjoy potentially significant economies of scale. In the case of investment expenses, they have access to more providers offering a wide range of investment vehicles at lower cost. Very large plans may be able to reduce investment expense even more through fee-reduction negotiations with the providers or use lower-cost institutional accounts. In other expense categories, the combination of flat (or nearly flat) fees regardless of plan size, plus declining per-capita charges for basic administration fee, reduce per-participant administrative costs among larger plans."

Finally, an independent education vendor is needed to provide participants with impartial and balanced information about investment choices. An independent educator can sidestep the inherent conflicts of interest that arise when an investment product vendor educates and counsels on asset allocation, financial planning issues and investment fees/costs in the context of their products. An independent education vendor is also the natural agent to empower participants with regular, understandable and standardized disclosure of product fees and investment option performance versus market index benchmarks.

5. Implications for investment program design and procurement

The number and types of investment options offered in a DC plan are critical. The overriding objective should be to provide a range of options that allows participants to choose a point as close as possible to the efficient frontier consistent with individual risk preferences. Within the context of the program objectives, investment options should be consistent with MPT, finance theory and best practices.

There are three interrelated issues influencing the number and types of investment options: diversification, costs and active management. Assume for a moment that markets are perfectly efficient and consider the issue of diversification. In a perfectly efficient market, index funds are the investment vehicle of choice and investment management costs are minimal. How many and what types of investment vehicles are necessary to "span the risk/return spectrum?" At least three: US Stocks, US Bonds and Cash Equivalents. For many years, those were essentially the options available to federal employees in the Federal Thrift Savings Plan.

These three choices minimally meet the diversification requirement of 404(c). However, we would argue this concise list should be expanded to include two categories: Foreign Stocks and Inflation-Indexed Bonds. An asset type should be defined at the highest pragmatic level of aggregation possible, where the next highest level of aggregation would combine securities with materially different legal, financial and economic characteristics. Foreign

Stocks and Inflation-Indexed Bonds have materially different characteristics than the three options.

Providing five index fund options representing the broadest representations of these asset categories would minimally satisfy the program's investment objectives. Among the set of liquid, highly diversified and unleveraged portfolios composed of public market securities, these five index options would qualify as low-cost and effectively span the lion's share of the risk and return spectrum. Importantly, these options span the short-term market risk dimension and the long-term income replacement risk dimension. The latter is defined by the possibility that a participant's account balance will prove to be insufficient to maintain a reasonable post-retirement standard of living. Over time, an employee's income tends to grow with inflation, improving productivity and prevailing market wages for similar occupations and levels of managerial responsibility. U.S. stocks have historically provided high average annual real returns and this long-term real return has been largely unaffected by the rate of inflation (Boudoukh & Richardson, 1993). The 1997 introduction of inflation-indexed bonds (TIPS) in the U.S. created a new asset type with extremely attractive characteristics for tax-deferred retirement accounts.

Ibbotson and Kaplan (2000) examined performance for balanced mutual funds and large DB pension funds and found that 99% to 112% of the total return level was explained by the fund's long-term asset allocation (the authors subdivided U.S. stocks into large- and small-cap sectors). Thus, five indexed portfolios representing broad asset types would allow plan participants to articulate their risk preferences. The average contribution of active management in the Ibbotson and Kaplan study was less than invigorating. However, the appropriate use of active management strategies is outside the scope of this paper. For guidance, it is useful to turn to best practices in the 401(k) arena where plan sponsors are subject to ERISA.

Table 2 provides summary data on 401(k) programs' investment options (BARRA RogersCasey/IOMA, 1999). Despite diversity in the aggregate, this same survey indicated that the median number of options was between 8 and 9 in 1999 and the majority of program administrators believed that the number of investment options became excessive around 11. A representative list of 8 options that generally comports with these corporate practices and recent academic research would be: money market option; total market nominal bond option; inflation-indexed bond option; total market U.S. stock index option; U.S. small stock option; U.S. value stock option; U.S. growth stock option; and foreign stock option. In addition, two or three balanced funds, optimized to reside on the efficient frontier, would provide one-stop shopping for participants reluctant to perform their own asset allocation analysis.

Waring et al. (2000) make a persuasive case that DC investment options should predominantly be optimized balanced funds. In their model design, asset type options should function as "specialty options." In part, they argue that participants should not be put in an environment that facilitates focusing on the short run game of trying to pick hot funds, to the exclusion of focusing on more important long run considerations, such as asset allocation. This model is not commonly used in corporate or public sector DC plans.

As indicated in the introduction, the relatively low numbers of options in corporate DC plans stand in stark contrast to the high numbers of investment options that are often put before participants in public sector plans. Moreover, public sector 403(b) and 457 DC plans often utilize multiple full-service bundled providers to generate diversity of investment

Table 2
Investment options offered by corporate 401(k) programs in 1999

	Percentage of plans all plans	Offering option large plans
Balanced Fund	77%	77%
International Equity	71%	70%
U.S. Large Cap Equity	70%	72%
U.S. Equity—Indexed	66%	75%
U.S. Bonds	63%	65%
U.S. Small Cap Equity	61%	51%
Stable Value (GICs/Synthetics)	60%	74%
Money Market	56%	42%
U.S. Mid Cap Equity	48%	40%
Company Stock	28%	56%
Global Equity	27%	21%
Lifestyle Options	19%	25%
Emerging Markets	15%	9%
International Bonds	8%	2%
Real Estate Investment Trusts	6%	5%
Self-directed Brokerage	9%	4%
Mutual Fund Window	7%	4%
Other	26%	30%
Memo: Respondents	448	57

Source: BARRA RogersCasey/IOMA Annual Defined Contribution Survey. Large Plans have at least 10,000 participants.

options within the program; a practice that is virtually unheard of in 401(k) programs. Clearly, duplicative administrative and educational services bloat costs and reduce overall benefits. Moreover, bundled providers have incentives to favor their branded alternatives, which creates an inherent conflict of interest in any educational services they might offer. In the next section, we empirically identify performance factors that support an unbundled procurement of private label institutional/wholesale investment options.

6. Comparative cost analysis

Table 3 provides cost data from 1996 that illustrates the basic attraction of institutional separate accounts relative to mutual funds: costs are far lower. Institutional mutual funds are special share classes with high initial minimum balances (e.g., $100,000) and limited provision of administrative services to the client, as well as lower charges for marketing and distribution. Institutional separate accounts typically operate wherein a custody bank safe-keeps securities in a group account and a manager(s) is authorized to trade securities in that account; individual and collective recordkeeping is performed by the custody agent or a third party recordkeeper. Institutional commingled accounts operate in a similar fashion as an institutional mutual fund, but pricing is generally at the level of separate accounts.

Table 3
Average mutual fund expense ratios and separate account management fees data from 1996 and expressed as percent of assets

Fund categories	Most common retail mutual funds in DC plans	Institutional mutual funds	$25 million separate account
Indexed U.S. Stocks	0.27%	0.35%	0.13%
Active Large Stocks	0.83%	0.91%	0.63%
Active Small Stocks	1.06%	1.01%	0.95%
Foreign Stocks	1.33%	1.15%	0.75%
Active U.S. Bonds	NA	0.69%	0.37%

Source: Cerulli Associates data cited in U.S. Department of Labor publication: Study of 401(k) Plan Fees and Expenses, April 13, 1998, Contract No. J-P-7-0046, Task Order

It is important to note that the mutual fund costs in Table 3 include investment and administrative fees, but the institutional separate accounts include only investment fees. However, institutional accounts with more than $25 million in assets should enjoy even lower investment advisory fees because their fees for institutional separate and commingled accounts (institutional accounts) are generally negotiated on a sliding fee basis according to the level of assets under management. In contrast, retail mutual funds charge all owners of each share class the same expenses, regardless of whether the owner has 100 shares or 2,000,000 shares.

The empirical analysis in this section compares investment advisory fee levels for institutional accounts and mutual funds and tests whether either vehicle lowers their investment advisory fees as assets under management increase. We find that institutional accounts have much lower investment advisory fees than retail mutual funds and provide significantly greater fee concessions as assets under management grow. In contrast, mutual funds provide fee concessions for administrative services. However, these services can be independently procured at costs competitive with the mutual funds' charges.

Our empirical analysis uses two data sets compiled by Freeman and Brown (2001) to compare the costs of actively managed domestic equity mutual funds and externally managed equity institutional investment products. Readers are referred to that paper for methodological details.

Freeman and Brown sent inquiries to the 100 largest DB public pension funds listed in the January 25, 1999 edition of Pensions and Investments. Data for 1999 was collected on 220 individual external actively managed domestic equity portfolios with a total of $97.5 billion in assets. The average portfolio size was $443 million, with the range extending from $15 million to $4.8 billion.

Morningstar's Principia Pro compilation for October 1999 was the chief source of mutual fund data. After eliminating funds with zero assets and missing data, the sample consisted of 4,943 equity funds. Multiclass funds were aggregated into single funds where weighted averages of various expense ratios were obtained, using subfund assets as weights. Investment advisory fee and administrative fee ratios were separately compiled, where adminis-

trative fees were defined to exclude marketing and distribution fees (e.g., 12b-1). Administrative fees include transfer agent fees, custodial services, accounting fees and director's fees. Screens were applied to generate a sample of mutual funds closely corresponding to characteristics of portfolios of public pension funds. The final mutual fund sample consisted of 1,343 funds representing a total market value of about $1.77 trillion. The average portfolio size was $1.3 billion, with the range extending from $15 million to $92.2 billion. Within the sample are 1205 retail mutual funds with a market value of $1.71 trillion and 138 institutional mutual funds with a market value of $56 billion. Institutional mutual funds were defined as single-class funds having a minimum initial balance of $100,000 or more.

Importantly, there are no significant differences between the cost economics of providing investment advisory services to mutual funds and DB pension fund separate accounts. Investment management firms commonly offer nearly identical investment products in both the institutional and retail markets. Investment management firms also access the same markets for inputs: human capital, information and technology. Thus, investment advisory services are essentially a commodity and fungible between mutual funds and institutional accounts.

However, there are significant administrative cost differences between mutual funds and DB pension fund separate accounts. Mutual funds are valued daily, rather than monthly. Also, retail mutual fund administrative fees incorporate accounting/record-keeping costs at the individual account level. These accounts are much smaller than the typical DB institutional account. Smaller account size entails higher average administrative fees. Therefore, we separate administrative fees and investment advisory fees in the following analysis.

This paper expands on Freeman and Brown's analysis in several ways. First, a more efficient simultaneous equation model is used to test for different economies of scale for mutual fund administrative fees and investment advisory fees. Second, cost equations utilize dummy variables to capture different cost structures for large-cap mutual funds, midcap mutual funds and small-cap mutual funds. Regression equations shown in 1 and 2 below were run on the mutual fund data and the results are presented in Table 4. Expense ratios are scaled in basis points and size is scaled in millions of dollars under management. Because of the exhaustive classification of the mutual funds, no intercept is included in the equations.

1. Administrative Expense Ratio = a(1)*(Natural Log of Size)+a(2)*(Large-Cap Dummy)+a(3)*(Mid-Cap Dummy)+a(4)*(Small-Cap Dummy)
2. Investment Advisory Expense Ratio = b(1)*(Natural Log of Size)+b(2)*(Large-Cap Dummy)+b(3)*(Mid-Cap Dummy)+b(4)*(Small-Cap Dummy)

The regression equations are highly statistically significant, as are all of the individual coefficients, except the size coefficient for institutional mutual funds. Significant economies of scale are apparent for both administrative expenses and investment advisory expenses. However, scale economies are roughly 2.5 times greater for administrative fees than investment advisory fees. This difference is statistically significant for the retail mutual funds and all mutual funds. For example, for a $500 million investment in a large-cap retail mutual fund portfolio, total administrative costs are about one-half the investment advisory fee.[2]

The gap in expense ratios between retail and institutional mutual funds is generally consistent with the fees shown in Table 3; noting that this latter report aggregated admin-

Table 4
Simultaneous equations estimates of active domestic equity mutual fund administrative and investment advisory fees per $10,000 of assets under management

	Coefficient estimates (T-statistics)		
	All mutual funds	Retail mutual funds	Institutional mutual funds
Administrative Expense Ratio			
Natural Log of Size	−6.4	−6.9	−3.6
	(−14.1)	(−14.3)	(−3.0)
Large-Cap Dummy	71.5	75.3	45.9
	(28.4)	(28.0)	(7.1)
Mid-Cap Dummy	72.0	74.8	53.7
	(29.5)	(28.8)	(8.4)
Small-Cap Dummy	71.8	75.2	48.8
	(28.8)	(28.8)	(7.1)
R-Squared	18.7%	20.8%	9.6%
Investment Advisory Expense Ratio			
Natural Log of Size	−2.5	−2.8	−2.8
	(−6.8)	(−7.4)	(−1.7)
Large-Cap Dummy	79.1	82.3	64.9
	(35.3)	(35.3)	(7.0)
Mid-Cap Dummy	88.5	89.7	91.2
	(37.8)	(37.1)	(9.8)
Small-Cap Dummy	95.6	97.4	93.1
	(46.1)	(46.8)	(10.0)
R-Squared	14.8%	15.0%	24.9%
Sample Size	1343	1205	138
Assets in Billions	$1,769	$1,713	$56
Chi-Square Test on Difference of Natural Log size Coefficients			
Chi-Square/Probability	39.6/0.0%	39.3/0.0%	0.13/71.5%

istrative and investment advisory fees. The smaller, although still significant, economies of scale present in the administrative services of institutional mutual funds is likely a result of the fact that they are bundled with materially lower administrative services and fees (see Fig. 1). Since institutional mutual fund share classes often perform limited individual services, they have to prepare fewer prospectuses, allocate fewer phone representatives, compile and maintain limited account data and so forth

Regressions of the form described in 3 below were run on the pension fund data. Expense ratios are scaled in basis points and size is scaled in millions of dollars under management. Because of the lack of an exhaustive classification of the pension fund data, an intercept is included in the equation.

3. Investment Advisory Expense Ratio = c(1)+c(2)*(Natural Log of Size)+c(3)*(Large-Cap Dummy)+c(4)*(Mid-Cap Dummy)+c(5)*(Small-Cap Dummy)

Table 5 contains the pension fund regression results and the comparable mutual fund results from Table 4. The analysis indicates that at low asset levels, investment advisory fees for the pension funds and institutional mutual funds are comparable, but are significantly

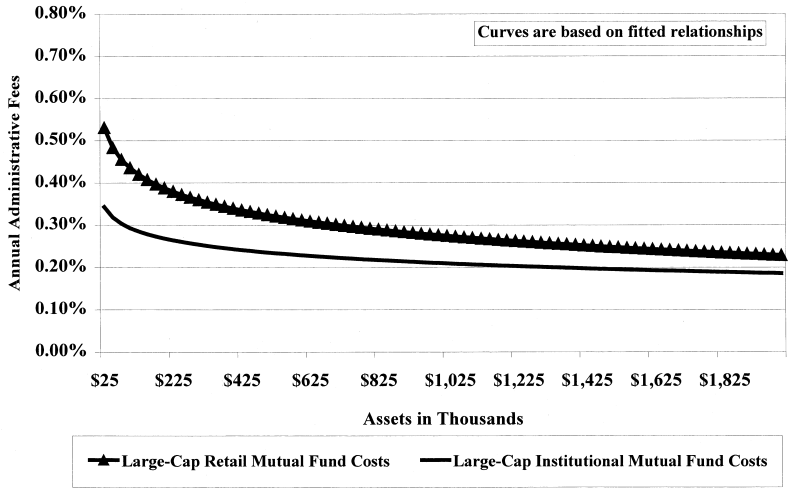

Fig. 1. Domestic Equity Administrative Expense Ratios for Active Retail Mutual Funds and Active Institutional Mutual Funds

below that of retail mutual funds for the large-cap category. Significant economies of scale are apparent in the pension fund account investment advisory fees. The slope coefficients for the pension fund regression is 2 times greater than the mutual fund regression reflecting that pension fund advisory fees are twice as sensitive to assets under management than mutual fund fees. At larger asset levels, institutional mutual funds have lower fee structures than

Table 5
Estimates of active domestic equity pension fund and mutual fund investment advisory fees per $10,000 of assets under management

	Coefficient estimates (T-statistics)		
	Pension fund	Retail mutual funds	Institutional mutual funds
Investment Advisory Expense Ratio			
Natural Log of Size	−6.1	−2.8	−2.8
	(−5.0)	(−7.4)	(−1.7)
Intercept	66.8	NA	NA
	(8.6)		
Large-Cap Dummy	−5.1	82.3	64.9
	(−2.1)	(35.3)	(7.0)
Mid-Cap Dummy	13.5	89.7	91.2
	(2.6)	(37.1)	(9.8)
Small-Cap Dummy	24.8	97.4	93.1
	(5.8)	(46.8)	(10.0)
R-Squared	50.8%	15.0%	24.9%
Sample Size	220	1205	138
Assets in Billions	$98	$1,713	$56

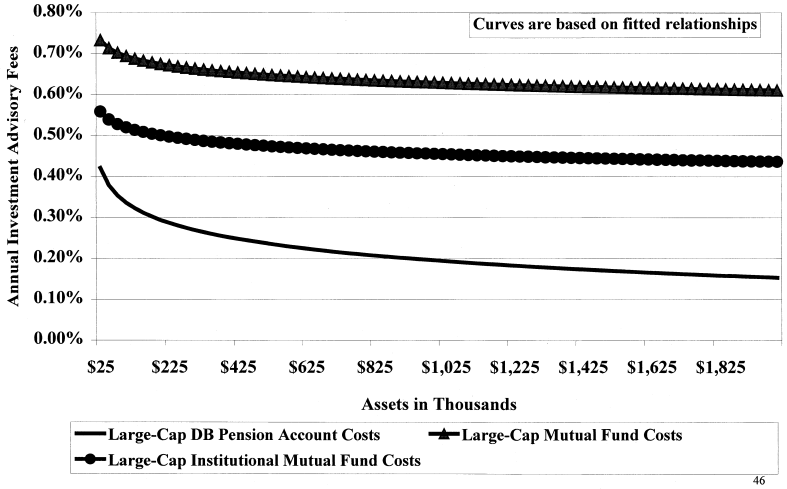

Fig. 2. Domestic Equity Investment Advisory Fees for Active Retail Mutual Funds, Active Institutional Mutual Funds and Active DB Pension Accounts

retail mutual funds, but do not appear to be competitive with the pension fund institutional accounts (see Fig. 2).

The economic impact of the differential fee structures is significant. For example, for a $500 million investment, the coefficients in Table 5 predict an investment advisory fee of 65 basis points for the large-cap mutual fund versus 24 basis points for a large-cap pension fund account. For an initial account value of $500 million, a 30-year horizon and annual market appreciation at 10%, the large-cap mutual fund fees would lead to an account value that was $870 million lower than that produced by the large-cap pension fund account.

It is clear why institutional accounts are considered a best practice arrangement in the corporate 401(k) arena: they have investment advisory costs that are one-half to two-thirds lower than retail mutual funds and are able to deliver additional cost savings as assets under management grow. Similarly, mutual fund's practice of passing through the benefits of economies of scale in administrative services, but not in investment advisory services is an important motivator for trustees to negotiate and procure unbundled investment products and administrative services.

Freeman and Brown (2001) conclude that the chief reason for substantial investment advisory fee level differences between equity DB pension fund portfolio managers and equity mutual fund portfolio managers is that advisory fees in the pension field are determined in a marketplace where arm's length bargaining occurs. They argue that mutual fund shareholders as a rule do not benefit from arm's length bargaining due to a dysfunctional regulatory system, and case law that, to date, has unduly favored advisory firms at the expense of their captive funds' shareholders. Mutual fund boards are typically dominated by employees of the investment advisory firm, even though the mutual fund is to be operated in the interests of the mutual fund shareholders.

Similar to investment advisory services, administrative services are essentially a commodity and there is limited product differentiation. Unlike advisory services, however,

competition appears to be more vibrant in the administrative services arena. It is common for small- and midsized mutual funds to purchase administrative services from third parties; rather than from their affiliated investment management companies. The natural economies of scale in administrative lines of business are demanded by the mutual fund companies and then, at least in part, passed on to mutual fund shareholders.

Under MPERS trustees have a duty to, "make a reasonable effort to verify facts relevant to the investment program." The basic industry cost information presented above strongly argues that trustees procure separate bids for administrative services and investment advisory services. Trustees and consultants should be able to obtain sufficient information to identify a normal operating profit rate for the stand-alone administrative services, given the DC plan's size and other circumstances. Moreover, all else equal, a large DC plan with an average DC account balance that exceeds average mutual fund account balances should be able to use an independent administrative vendor to meet or beat the cost structure of retail mutual funds. As noted above, flat or declining per-capita charges for basic administration fees, reduce per-participant administrative costs among larger plans when expressed as a percentage of assets (U.S. Department of Labor, 1998). Separate procurement of administrative services eliminates the mutual fund as a middle-man and any associated profit margin built into its procurement of services for shareholders.

7. The trade-off between participant choice and effectiveness

The existence of economies of scale in institutional investment products sheds a negative light on the practice of offering multiple versions of the same type of investment option; for example, two active large-cap options. The common rationale for offering multiple versions of the same option is to afford participants choice; with the expectation that participants might be able to exit a poorly performing fund and choose a substitute that performs better going forward. However, trustees must critically evaluate the expected marginal costs and benefits associated with providing choice on this dimension.

Even with a sophisticated participant base, it seems unlikely that the expected benefits of expanding the choice of duplicative investment options would materialize. There is a major gap between the information retail investors can obtain on retail products and the information professional staff can obtain on institutional products. In the search and monitoring phases for institutional pension fund managers, professional staff typically gathers and analyzes detailed information on aggregate performance and dispersion across subaccounts, investment strategies, real-time holdings data and trading activity, portfolio management, trading and research personnel, risk management processes, trading arrangements, trading effectiveness, and so forth. In contrast, retail mutual fund investors are generally limited to historical aggregate return information, semiannual holdings data and historical turnover statistics. Unfortunately, recent studies (Carhart, 1997; Kahn & Rudd, 1995; Malkiel, 1995) show that past performance has virtually no ability to predict future performance by domestic equity managers and has mixed results for fixed income managers.

On the other hand, the expected marginal costs resulting from expanded choice are certain and material. First, for a given asset base, expanding the set of options compromises a

Table 6
Allocation of 10-year cumulative costs for $1 billion active large cap domestic equity structures. All institutional funds and institutional/mutual fund mix

(Cost in millions)	All institutional	1 Institutional/2 mutual funds
Direct Cost to Mutual Fund Investors	$17.56	$71.41
Direct Cost to Institutional Users	$8.78	$8.78
Indirect Cost to Institutional Users		$3.60
Total Costs	$26.34	$83.79

program's ability to maintain low costs. For instance, splitting a $1 billion large-cap active institutional mandate into three institutional mandates causes costs to rise by 34%. Additionally, under an institutional product structure, there are cost externalities created by facilitating choice among duplicative products. These externalities are a nontrivial matter, given the duty of impartiality: trustees' obligation to consider the impact of design decisions by taking into account any differing interests of participants.

Table 6 provides an estimate of the externality created when two mutual funds are introduced to compete with an identical institutional fund. We assume that after the expansion of choice, each option gets one-third of the assets that had originally been invested in the institutional option. This assumption is conservatively based on data from Fidelity Institutional Retirement Services Company (1999) and the recent allocation of participant balances within the State of Michigan DC plan. For a ten year horizon, participants that prefer the low-cost generic institutional option over the higher cost name-brand options are forced to pay about 40% more in fees because assets move into the branded options.

This analysis also points to the unavoidable tension between participant desires, especially the demands of vocal subsets of participants requesting more investment options, and the trustees' duties to the overall group of participants. Using the cost analysis from above, it is possible to demonstrate that fiduciary duty precludes trustees from maximizing participants' choice of investment options; to do so would be in direct conflict with the trustees' obligation to discharge their duties for the sole interest and exclusive purpose of providing benefits.

Imagine that a poll of participants were conducted regarding their nominees for investment options, prior to drafting an investment policy statement or conducting an education program. It seems reasonable to expect that their preferences would resemble the retail mutual fund market, with a smattering of bank deposits and insurance products. Adopting an investment policy statement that incorporated each of these nominated products would maximize product choice from each individual's perspective.

However, the high cost of such a "maximal product choice design" would substantially erode terminal retirement benefits for participants in the aggregate, relative to benefits provided through a set of low-cost investment options that represent the basic asset types. Consolidating all assets in comparable retail investment options (e.g., large-cap domestic equities) into a single comparable retail product would create significant economies of scale in administration and advisory fees for participants. In turn, that retail product would be higher cost than an equivalent institutional mutual fund share class; which would be higher cost than an institutional separate account.

Finally, in terms of investment performance, there is no basis to expect that higher cost

investment products (i.e., retail vs. institutional) are more effective. In fact, large plan DB and DC practice suggests quite the opposite. Domestic equity mutual funds are rarely used within large DB plans and EnnisKnupp (1999) reveals the vast majority of corporate DC plan administrators believe institutional accounts are more effective than mutual funds.

8. Conclusion

New public sector DC plans face important challenges in program design. However, there is a clear legal, fiduciary and governance infrastructure that should be adopted. With such an appropriate infrastructure, public sector plans should largely conform to ERISA going forward and reflect best practices in the private sector.

The major challenge facing public sector trustees is to reconcile fiduciary duties with the desires of individual plan participants. ERISA, MPT and best practices in the corporate arena strongly suggest that the number of investment options should be limited and an institutional structure should be utilized where all costs are identified separately and tightly controlled. In contrast, participants and other interested parties can be expected to argue vociferously for an expansive list of recognizable, branded investment options. In the context of proposed Social Security reforms, the massive stakes for retail investment firms can be expected to generate proportionally large rent-seeking activities.

Based on empirical analysis presented above, the two views appear difficult to reconcile. The retail approach, although intuitively appealing and familiar will result in higher costs and lower aggregate participant benefits in the long run. Ultimately, trustees must choose between what is right and what is easy and popular. Giving trustees sufficient independence and subjecting them to stringent fiduciary duties should ensure that they make the appropriate design choices.

Notes

1. A 1999 national survey of defined contribution plans by John Hancock Financial Services indicates that less than one-quarter of respondents consider themselves knowledgeable investors. Forty-one percentage believe that money market funds include equities and 49% believe they contain bonds. Most have no strategy or goal for allocating their retirement investments. Most say they would pull money out of equities or reduce future allocations to equities if the stock market experienced a significant downturn (John Hancock Financial Services, 1999). Recent academic studies indicate that individual 401(k) investors naively diversify among the available investment options and individual investors tend to chase the hottest performing sectors, trading excessively and generating poor results (Benartzi & Thaler, 2001; Barber & Odean, 1999; Benartzi, 2001). A 1996 survey conducted by the Securities and Exchange Commission and the Comptroller of the Currency found that fewer than one in five mutual fund investors could give any estimate of expenses for their largest mutual fund, and that fewer than one in six fund investors understood that higher expenses can lead to lower investment returns.

2. A full information likelihood technique was used to estimate the simultaneous equations. In addition, standard errors and covariances were estimated in a single equation context using Newey-West HAC and White Heteroskedasticity-Consistent technique. Neither technique materially affected the overall results. The general results were also insensitive to excluding the smallest and largest 10% of the retail or institutional mutual fund sample. Results were generally insensitive to approaches using Morningstar's equity style categories to segregate the sample or develop exogenous variables. Regressions were also performed on subsets of the mutual fund universe using simple one variable equations in order to determine whether scale economies might differ for large-cap mutual funds, midcap mutual funds and small-cap mutual funds. Results for administrative expenses for retail mutual funds are generally consistent with those from the systems approach presented in Table 4. However, investment advisory expenses appear to differ materially for the midcap mutual funds (no economies of scale) and small-cap mutual funds (economies of scale comparable to administrative expense) relative to results in Table 4. Nonetheless, at $500 million of assets under management the small-cap mutual fund coefficients in Table 4 predict an investment advisory fee of 80 basis points versus the 76 basis points predicted by the single equation coefficients. The predicted results for midcap funds are similarly close.

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