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Investment Insights

Creating, transforming and sharing knowledge

Mind the Gap!
Why DC Plans Underperform DB Plans, and How to Fix Them

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Mind the Gap! Why DC Plans Underperform DB Plans, and How to Fix Them

Workers of the world, congratulations! You have been promoted to chief investment officer for your portion of the retirement fund!

We're kidding, of course. (Well, maybe we're not.) But the task facing participants in defined-contribution (DC) pension plans closely resembles that performed by chief investment officers, who make the asset-allocation and fund-selection decisions for traditional defined-benefit (DB) pension plans, endowments, and foundations. There are three major differences: (1) leaders of institutional funds have the training and experience to do the needed work, while the vast majority of participants do not, (2) they don't have to do it in their personal time as participants must do, and (3) it's not their money. In contrast, workers who fail at the task of managing their DC plan assets will have to live with the consequences of retirement incomes lower than they would have had if they had invested their retirement fund in competently managed, risk-controlled, strategically oriented investment disciplines.

Because nearly all DC plan participants are poorly positioned to make investment decisions, their investment returns are low. According to a leading benefits consulting firm, the returns achieved by DC plan participants have lagged institutional investors' returns by 2% annually.[1] Lest anyone mistake this rate of underperformance for a small number, note that $100,000 invested at 10% for thirty years grows to $1,744,940, while the same amount invested at 8% for thirty years grows to only $1,006,266. The missing 2% compounds to nearly *three-quarters of a million missing dollars* for a hypothetical investor with a 30-year time horizon, roughly the average time between mid-career and mid-retirement for today's long-lived individuals.[2]

Clearly, the "little guy" has gotten very little benefit from the last half century's many advances in the art and science of portfolio management. It's time to change that.

A simple two-step solution with the best chance of success

First, since participants are unlikely to have or to acquire the skills needed to build suitable portfolios, it should be *done for them*, and done right, using the best practices of today's most sophisticated investors: the large institutional funds. Sponsors should offer prepackaged, mean-variance-efficient mixes of funds (that is, funds offering the highest expected return for a given level of acceptable risk), which provide diversified exposures to all major asset classes, at reasonable levels of fees. This can close most, or all, of the gap, at least for those well-informed participants smart enough to choose this wise option. After all, how is this really different from many of the purchases we make today?

A second, but equally important task, is to get participants to invest in the prepackaged mixes (since we can't require them to do so, and some participants will still choose the traditional types of DC fund offerings). By refocusing participant communications on investment strategy, we can hope to move them away from their current focus on the plethora of fund choices now being offered and toward the more important decision: the total portfolio solution.

What are the "best practices" of institutional investors? We describe them in more detail below, but basically they consist of getting the steps of the investment process in the right order. The very first step for institutional investors is to determine their investment *strategy*. This means using the teachings of financial economics to estimate expected returns and risks for each asset class, calculate the efficient frontier, and specify an asset-class mix—all top-level decisions. Only when the strategy is completely in hand, do they move to the more tactical issues of fund selection and implementation. In sum, best practices are about asset allocation or investment strategy, appropriateness of investment vehicles chosen, and management of fees and costs.

The DC-plan investment process usually gets this backwards, with the choice of funds given much more focus and priority than the decision about investment strategy. We would describe today's typical DC plan as "fund-oriented," rather than "strategy-oriented." When a plan is fund-oriented, the investment strategy is an accidental by-product of fund selection, and is almost inevitably flawed. The many symptoms of the "performance disease" of DC plans—low returns, high costs, inattention to risk—can be traced to this reversal of priorities.

1. Explaining the shortfall

Strategy reasons for underperformance

Generally, DC participants have two separate, but related, problems in forming suitable portfolios. The first problem is that they are unable to get to the "efficient frontier" because they don't have access to the requisite tools to successfully build diversified portfolios offering the highest expected return for each given level of risk—as a real strategic approach to investing would accomplish. The second problem is that they are taking inappropriate amounts of risk, either too much or too little. These shortcomings can have a tremendous impact on a participant's nest egg over a typical 10-to 20-year investment horizon (Figure 3, page 11).

A. Investors' portfolios are off the efficient frontier

Despite attempts by leading providers of investment funds and DC administration services to educate participants, the most significant obstacle to efficient investing by plan participants is lack of investment knowledge. The techniques and suggestions designed to help participants create sensible investment strategies have simply not been successful. In the modest amount of time the overwhelming number of participants are willing to give to the problem, they are unlikely to learn the tools mastered by only a relative handful of sophisticated

Underinvesting

Participants often contribute less to the plan than is needed to achieve their goals. Underinvesting is not a source of low returns per dollar invested—it does not contribute to the missing 2%—but it is worth a mention because of the tremendous contribution of underinvesting to the broader problem of DC plans failing to fulfill investor goals. Because one can accomplish only so much by varying one's investment aggressiveness, no asset provides the return needed for many plan participants to achieve the level of retirement income they expect. The rest of any shortfall must be—can only be—made up by additional contributions or by accepting a lower level of retirement spending.

To the extent the actual or potential legal liability of the defined-contribution sponsor is created by failure to persuade investors to invest enough to meet retirement needs, underinvesting is or should be a source of concern to sponsors. Sponsors should be aware of the responsibility to provide plan participants with sound advice on how much to invest, what rate of return can be reasonably expected, and what one's end-of-career wealth and income are likely to be. Many sponsors engage in such an effort now, but the effort is generally ineffectual, with participants' investment rates said by some observers to be bimodally distributed—one large group invests the maximum permitted, while another large group invests the minimum. While employers should understand that personal circumstances differ and not everyone can invest what would ideally be required, the employer should play a leadership role in encouraging employees to maximize their retirement-plan contributions.

investment advisors, who have had the advantage of graduate education and years of training. Even if participants could overcome this obstacle, there are other obstacles to building strategies that provide the same efficiencies available to the serious institutional investor.

Until recently, the historical choice set for DC participants typically consisted of guaranteed investment contracts (GICs), a balanced fund, a growth fund, and, only very recently, an index fund (all US only). Such a choice set simply does not contain the asset-class building blocks that are required to construct mean-variance efficient portfolios. No responsible defined-benefit pension plan sponsor would ever build a portfolio out of these “primitive” pieces.

While the list of the “best” asset-class building blocks merits an in-depth discussion of its own, a list representing the minimum types of funds that can be considered reflective of institutional best practices, with likely benchmarks in parentheses, might be:

- Large-capitalization US equities (S&P 500 Index)
- Smaller-capitalization US equities (Russell 2000 or various extended market indices)
- International equities (MSCI EAFE or ACWI Indices)
- Diversified domestic fixed income (Lehman Aggregate Index)
- Cash

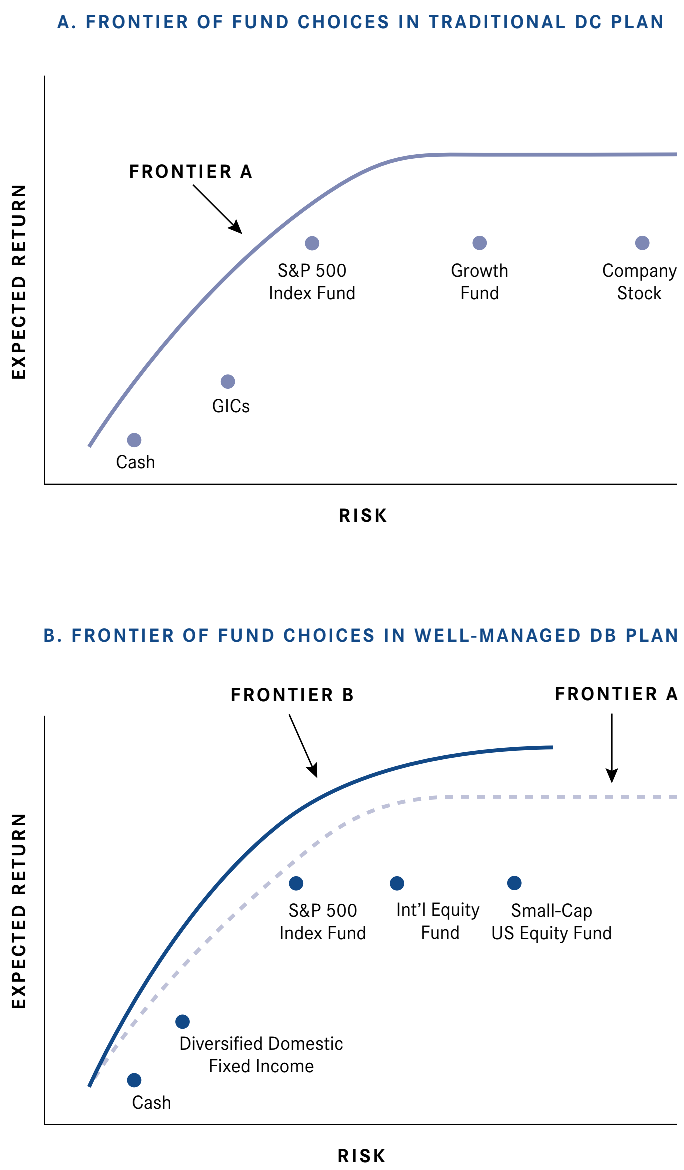
…where each building block is *itself* fully diversified, and managed at a reasonable cost. For each asset class, institutional investors go to a great deal of trouble to align their managers’ benchmarks to their own to avoid glaring “benchmark misfits,” and to keep the level of active risk and the level of fees reasonably low. In an environment where fund choices predominate, these important concerns are completely lost.

Even so, the recent trend has been for DC sponsors to enrich the choice set to include a greater variety of equity and bond funds, including international, high-yield, and growth and value styles, and sometimes even multiple managers within an asset class. This improves the investor’s situation, but fails to address the basic problem of poor asset allocation, caused by the emphasis on fund selection rather than on investment strategy. Under the current system, investors typically don’t even know they are making risk or asset-class choices. Because investors are allowed to focus on making *fund* choices, most participants do not build portfolios that have a sensible investment policy, despite expensive efforts to educate them.

In addition, the longer lists of funds now often offered are dominated by active funds with high fees. While institutional investors have long relied on low-residual-risk "core" investments in each of their asset classes to reduce both risk and expense, DC participants have not been encouraged to mimic this sensible design. So, even with this more fully fleshed out choice set, the choices would not be comfortable to most sophisticated defined-benefit plan sponsors if they were required to use them for their DB plans.

Figure 1 shows two frontiers: the lower one constructed from traditional DC-plan components (A), and the higher one constructed from the list we said was representative of institutional best practices (B). If investors are only offered the portfolio choices used to construct frontier A (we are reluctant to call it an "efficient" frontier), regardless of their individual skill, they cannot reach the true efficient frontier (B) and will underperform over time for that reason. In Figure 2, which enumerates the many sources of underperformance in typical DC plans, we call this underperformance the *loss from inadequate fund opportunities.* Even worse, investors in traditional DC plans cannot even reach frontier A since they would have to hold an optimal combination of the funds composing it, and they do not have the investment strategy

Figure 1



knowledge or tools to do so; we call this the *loss from inefficient use of existing fund opportunities.*

B. Investors take the wrong amount of risk

Many investors allocate their DC investments in ways that are completely unsuited to the achievement of their investment goals. By far, the most common misallocation is to take too little market risk, with the bulk of one's assets in cash GICs and other stable-value investments. Workers young and old are affected by this folly, as are skilled workers and executives in "sophisticated" companies that sell or use advanced technology or financial services. These investors hold little or nothing in stocks, and even their holdings of bonds are often quite limited. Because the return on cash and cash-like instruments is often many percentage points below that on more appropriate mixes that include stock and bond funds, investors who take too little market risk may experience a shortfall far greater than 2% over a long time horizon (see "Underinvesting," page 3).[3]

A less common problem is excessive risk-taking. A small but visible group of investors seeks extraordinary returns through a 100% equity allocation in their DC plans, often using the plan's fund-switching mechanism to pursue the hot fund of the week. If the plan is heavily funded with company stock and that stock has been a strong performer, these participants may refuse to diversify, confusing future with past performance (the board of directors is often happily complicit in building this very undiversified exposure). If a DC plan has a self-directed brokerage option that allows participants to invest in individual stocks, these investors often hold more speculative positions such as biotech and Internet startups. Because undiver-

Figure 2

SOURCES OF UNDERPERFORMANCE IN TYPICAL DEFINED-CONTRIBUTION PLANS RELATIVE TO WELL-MANAGED DEFINED-BENEFIT PLANS

Loss from inadequate fund opportunities
(frontier A below frontier B)

Loss from inefficient use of existing fund opportunities
(investor does not even reach frontier A)

Loss from insufficient risk-taking
(even if investor could reach frontier, chooses wrong point on it)

Loss in utility from taking active risk with no payoff
(even if active managers average to index performance with index fee)

Underperformance of active management
(compared to index or to well-chosen active funds)

Fees and hidden administrative costs
(compared to institutionally negociated fee structure)

Transaction costs: commissions, spreads, and market impact
(compared to index or to low-turnover active strategy)

COLOR KEY:

- Effect of macro fund structure
- Effects of behavior of poorly educated participants
- Effects of active management
- Fees and transaction costs

sified portfolios rarely perform well in the long run, at least on a risk-adjusted basis, investors in this category are a part of the underperformance problem.

If one looks at aggregate asset-allocation data for DC plans, the mix is not bad—about 70% in stocks (including company stock) and 30% in fixed-income, stable-value, and cash instruments.[4] But if one disaggregates the data and looks at individuals' allocations, extreme positions such as those described above are shockingly common. The future wealth divide between good investors, on the one hand, and poor investors (whether in cash or risky stocks), on the other hand, could become a serious social and workplace problem. Figure 2 assumes, for the sake of illustration, that a given investor takes too little, rather than too much, risk and refers to the result as the *loss from insufficient risk-taking.*

Implementation reasons for underperformance

A. Too much active management

Many plan sponsors offer only actively managed funds to DC investors. Others provide both active and indexed choices, but offer them in a format that fails to highlight the advantages of using indexed and risk-controlled active funds versus concentrated active funds as the principal sources of exposure to an asset class. The typical result is a participant portfolio that is far too skewed toward active management, causing the portfolio to have a higher-than-appropriate level of residual risk and higher-than-appropriate fees. Moreover, since plan participants tend to choose "hot" funds, and "hotness" in funds is often style or momentum driven, participants' portfolios often contain active bets that are highly correlated across managers rather than being diversified in terms of their active risk.

Active management is difficult enough for institutional investors, who have access to extensive manager databases and can interview managers personally; nonetheless, active managers rarely beat the indices in a consistent manner. (This is understandable because active management is arithmetically a zero-sum game before fees are taken into account; after fees and other investor costs, the sum total of all active managers must underperform the index.[5]) It is difficult to imagine that individual DC plan participants can win at this game. To the extent that DC participants should invest with active managers, it should be as part of the prepackaged-fund mixes referred to earlier.

B. Quality of active management is too low

If DC participants invested in *average* active managers, the damage would be limited because these managers in aggregate would deliver index-like performance, minus fees and transaction costs. However, the problem is worse than that. Many DC sponsors select their fund provider on the basis of ancillary services (recordkeeping and administration), rather than on the basis of expected active management performance. To the extent successful active managers can be identified, and this method most certainly does not do so, one should not be too surprised that the resulting manager choices tend to be subpar performers. Plan participants would be better off in an all-indexed position if the sponsor is unable to put the right resources and talent into the selection decision, free of ancillary constraints.

Figure 2 refers to the *underperformance of active management*, relative to an appropriately chosen benchmark, as a source of loss in typical DC plans. Underperformance aside, the presence of too much active management in a plan causes another type of "loss," namely the *loss in utility from assuming active risk with no expected return payoff*, so we display this subtle—but real—effect as a separate category in the exhibit.

C. High commissions and fees

High investor costs, including manager fees and the cost of transacting, are yet another source of underperformance in DC plans. Mutual funds, which currently form the basis of practically all DC investing, have fee structures which can be twice as high as those of otherwise comparable institutional funds.[6] If not properly monitored and managed, fees and transaction-related costs can easily sum to 2% or more—occasionally much more—per year (Figure 2). Transaction costs have several components, of which direct costs (brokerage commissions and bid-asked spreads) are only a small part; market impact and the opportunity cost of delays in trading and missed trades are hidden costs that can be a multiple of the direct costs.[7] While the lack of an investment-strategy focus is not directly responsible for the high level of investor costs in DC plans, the neglect of a policy creates a culture in which high costs are easily hidden or ignored.

D. Hidden administrative costs

Finally, many sponsors choose mutual funds with retail price structures in return for the mutual fund agreeing to provide, at low or no cost, the recordkeeping and administration required by the plan. This is most typical at plans where the sponsor has agreed to pay the recordkeeping costs, while the investment management fees are charged back to the plan's participants. The "free" recordkeeping feels like a smart budgeting move. This has been carried to its logical next step in many cases, with sponsors demanding "rebates" from independent fund vendors to be used by the sponsor as a contribution to administration costs.

This is not a healthy arrangement. There is a huge difference between retail and institutional pricing for comparable funds, and DC plans typically have the size to gain access to low-cost institutional pricing structures. The excess fees, which constitute the price actually being paid by the participants for administration, are very high and get higher the larger the per-person account balance. By comparison, most third-party administrators would be charging on a per head basis, not based on the assets under management.[8]

It doesn't take much reflection to see that these corporations have negotiated a benefit for themselves—a low or zero administration fee in return for a hidden cost that participants have to pay. It's a fiduciary issue; the sponsor has succumbed to a conflict of interest to the detriment of its plan participants.[9] In the meantime, excess fees are fully equivalent to lower rates of return.

2. Where did we go wrong? Root causes of the problem

DC fund structure as a historical artifact

In the early days of DC plans—that is, through the 1970s and much of the 1980s—many of these plans were provided by insurance companies. Insurers early on invented the guaranteed investment contract (GIC), and it was natural that fixed-interest annuities and GICs dominated the market. Because neither annuities nor GICs are marked-to-market (in the sense of adjusting portfolio valuations for interest-rate fluctuations), these types of products give the participant a mistaken impression of little or no risk. In fact, the word "guaranteed" in GIC is not, as widely marketed, a guarantee against risk, but merely a guarantee by the insurance company issuing the contract not to reduce the stated rate of return. There is no third-party guarantor in the normal sense of the word. Guaranteed investment contracts can be risky, as was proven conclusively by the defaults of Executive Life and Mutual Benefit Life, both major carriers with top ratings.[10]

Some funds also contained company stock, which was seen as aligning the interests of employer and employee, and was sometimes naively regarded as "free" from the point of view of the corporate treasury. To this motley mix, a money-market fund and a few equity or balanced mutual funds were sometimes added.

Amazingly, the GIC-centered structure described above was dominant well into the 1990s, by which time many defined-benefit plans—sometimes at the same companies!—had been very progressive and well managed for years.[11] (Long before that time, the defined-benefit plan community had established the primacy of investment policy and strategy over manager selection issues, and was starting to diversify into international, small-capitalization and value stocks, multiple styles of fixed income, and other carefully chosen asset classes.) Around 1987, Fidelity Investments began a strong play to convert sponsors to a DC structure based on mutual-fund choice, but that approach took a few years to catch on. By the early 1990s, however, this mutual-fund revolution in personal investing had made a remarkable inroad into DC plans. By the end of the 1990s, participants in most plans had many funds to choose from, but little useful help in building sensible, efficient portfolios.

As a result of this evolution, the DC world that emerged during the 1990s is very much fund oriented, not strategy oriented. Participants still have almost no access to strategy advice or to prepackaged, well-diversified and efficient portfolios of asset classes.

Lifecycle or lifestyle funds, which evolved in 1990s as a potential solution to the problems we have identified, are capable of making up this DB/DC gap, but have not yet successfully done so. Most are poorly engineered by portfolio managers who know more about picking stocks than about total portfolio investment strategy. Furthermore, when lifecycle funds are offered, they are usually communicated poorly, and the concept that such offerings provide a complete investment strategy *in a single fund* is rarely understood by participants with any degree of success.

This haphazard evolutionary path clearly has not produced a structure conducive to participants building efficient portfolios. The fund-oriented approach pushed by the mutual fund houses (which has largely replaced the GIC-centered approach of the insurance industry) gives investors access to many specialty funds, which at best divert the investor from the asset allocation work to be done. At worst, the profuse fund choices encourage high fees, poor diversification, and uncompensated risk-taking by investors chasing recent past performance.

In most DC plans, then, there is no emphasis on making sure all the building blocks needed to construct efficient portfolios are even available for use, much less that they are used appropriately by each participant. Moreover, index funds, which are very effective at providing asset class exposure with low residual risk and substantial cost-savings, when used as a core investment, are used lightly and without supporting information.[12]

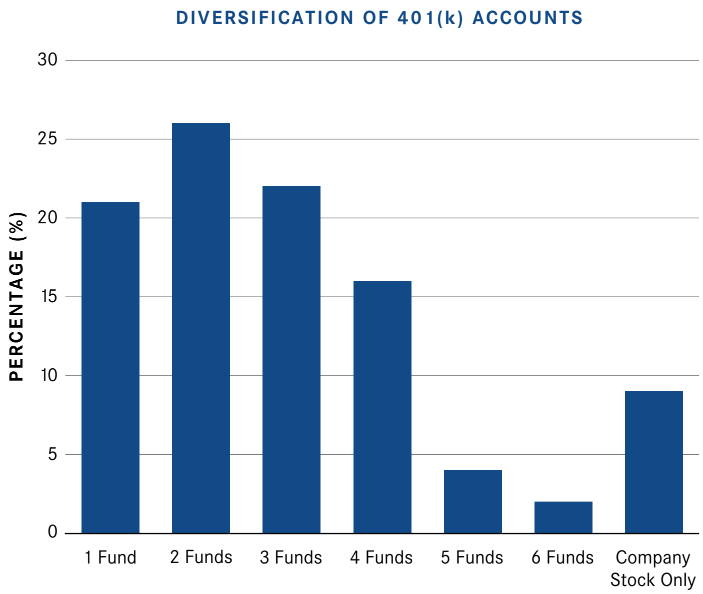
Failure of participant education

As DC sponsors built their plans, they recognized that participants would have to be educated on the principles of investing. To this end, much earnest labor has been performed. The output of written, spoken and electronically delivered educational programs, as well as asset allocation and financial planning software, has been massive.

Despite this effort, the majority of participants today still have a poor grasp of investment basics. Many participants do not know what an asset class is, much less the expected return and risk differences among them. They typically understand little about the need for diversification and a long-term perspective on asset allocation and fund performance. Few participants are aware of the fees being charged, or of the cost and performance differences between active, indexed, and blended investment styles. Moreover, participants often have unrealistic market expectations that drive their investment decisions.

Even though educators are usually competent and investors try to exercise common sense, the academic principles underlying investment theory are technical and require extensive learning. Unfortunately, plan participants rarely budget the amount of time needed to become proficient as an investor. As we noted at the outset, chief investment officers and other professionals spend years learning these principles, and still do not always get everything right. DC participants, whose career-based knowledge is usually unrelated to investment knowledge, are not about to master this trade in a few hours of employer-sponsored (and usually optional) training.

Figure 3



As of December 31, 1999.
Source: BGI, February 2000.

As evidence of the inadequacies of participant education, and as proof that DC investments are managed well below the normal standards of institutional investing, simply look at the number of funds chosen by participants in any DC plan with which the reader is familiar. Normally, most employees will have selected just one, two or three investment choices as suggested by the data in Figure 3, which details the experience of one prominent corporate plan sponsor and represents what we've learned from sponsors with whom we've met. With this degree of portfolio concentration, clearly the message of diversification is not getting through, even at the most basic level, and concepts of *optimal* diversification, so important to sound investment strategy, are not even within reach.

3. The cure

Outline of a desirable product mix: "Do it for them"

Any number of fixes for the problems identified in the previous sections can be imagined, but a shot through the heart of the problem is the simplest and best solution: Build well-engineered, complete investment strategies—families of pre-mixed asset allocation funds. Then, encourage participants to buy into these funds by communicating that such funds are fundamentally different, and fundamentally better, than traditional fund choices.[13] For this message to be successfully conveyed and acted upon, these funds must be marketed and introduced to the participant as a premier investment selection, elevating these optimal strategies to a prominent position.

What follows is a design for a DC product mix that puts strong emphasis on the approach we believe is best for most investors. Because pre-mixed asset allocation funds do not meet the needs and desires of every investor that a DC plan is expected to serve, our design keeps other choices available.

A. *The solution for most investors:* pre-mixed efficient portfolios

As we just indicated, the core of our approach is to offer, and aggressively market, pre-mixed portfolios of assets at different risk levels. Following institutional practice, the portfolios are constructed by:

- First, identifying relevant asset classes, setting capital market assumptions, and computing the efficient frontier
- Second, from among the different investment strategies represented by each point on the efficient frontier, choosing the one having the targeted or budgeted risk level
- Finally, "staffing" each asset class in the mix with an appropriate fund or funds.

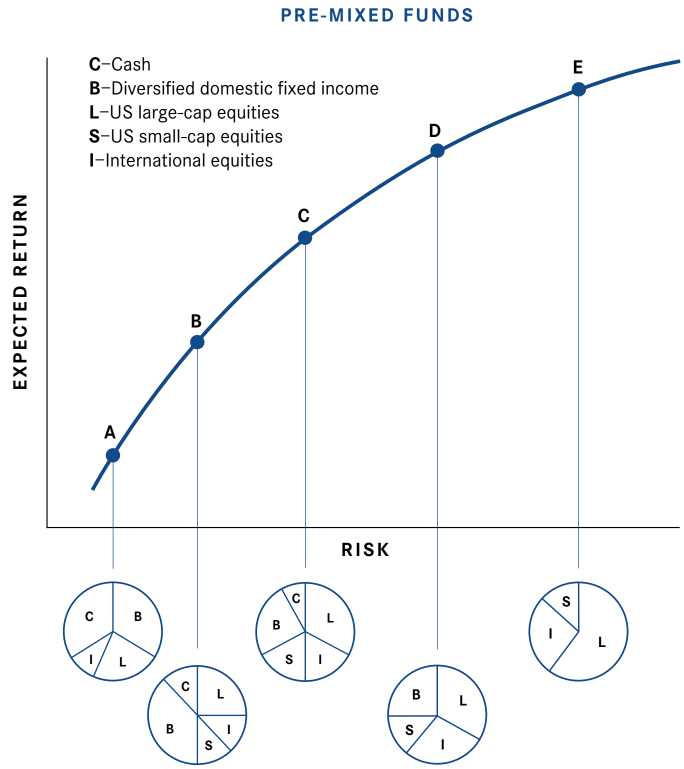
(This, of course, is just a bare outline of the institutional approach to portfolio construction; we provide more detail below in the section on implementation.)

Usually five of these strategic portfolios, spaced along the efficient frontier from conservative to aggressive, should be enough to match the preferences of almost all individual investors. Figure 4 (see page 13) shows illustrative mixes for five risk choices.

Following Waring and Castille (1998), each asset class will be "staffed" with a mixture of indexed and active funds.[14] The proportions would be decided on the twin considerations of the sponsor's confidence in its skill at selecting active managers, and the need to meet a "budget" for active risk. It is important to keep products simple and costs low. For example, a major asset class such as US large-capitalization equities could be represented entirely by an index fund for the lowest cost and lowest active risk. Or, if there were some confidence by the sponsor in its ability to select active managers, it might be represented by 50% in an index fund plus 25% each in two actively managed funds. This would produce an active risk in the 2% region, which could be more or less depending on the specific characteristics of the active managers chosen. In contrast, an all-active manager structure will have upwards of 4% active risk at the asset class level if it includes two or three traditional active managers of average individual risk.[15]

A pre-mixed approach is well suited for participants who lack the time, the knowledge or the interest to develop their own strategies. Likewise, this approach also serves the interest of the truly sophisticated investor, who appreciates well-engineered investment strategies and is happy to take advantage of them when offered. Finally, the pre-mixed approach helps the sponsor to communicate with confidence that institutional "best practices" are being offered to participants, and that *participants can reasonably expect to earn returns comparable to those earned by the world's best-managed investment institutions.* Participants will have efficient portfolios, maximizing expected return at their preferred level of investment risk, just as large investors do.

Figure 4



Asset mixes are for illustrative purposes only.

B. *For people who want to determine their own asset-class mix:* building blocks by asset class

Of course, sponsors often cannot require participants to invest in these pre-mixed portfolios without other options, and there is a strong minority of participants that want to build their own portfolio. To encourage the "mix-your-own" investor to remain oriented to mixing a strategy rather than just picking a bunch of funds, it is useful to offer a set of well-designed asset-class building blocks such as those outlined in the previous paragraph. Index funds, carefully chosen funds of funds, or other funds designed to be clean implementation vehicles for the key asset classes, with low costs and low active risks, are appropriate here, and it makes sense to have the same ones used in the pre-mixed strategies available for the mix-your-own investor.

C. Specialty and legacy funds

Another category much lower in investment utility, but often politically required, consists of certain specialty funds and legacy funds. It is difficult to "take away" existing funds from participants in the DC world, and yesterday's poorly chosen funds may have an audible constituency that can't be ignored. The current literature often refers to these active investors who make up this audible constituency as "sophisticated," but the term is probably a misnomer. Certainly it is a misnomer if one accepts the prevailing wisdom in institutional investing that strategy is paramount, and that rapid fund switching and placing of large "bets" are unlikely to be productive over any reasonably long period of time. For the *truly* sophisticated investor, the focus will be on a mix of the major asset classes held with a high degree of stability over time: an efficient investment *strategy*.

For sponsors that need to serve this active group, however, specialty funds—such as real estate, growth- or value-biased funds, technology funds, and popular legacy funds that don't fit well into the strategic framework—can be offered if positioned at an eye level below the basic strategic options, which in effect are on the "top shelf." This helps to minimize confusion for the majority of the population, who are better off with their attention focused on strategic solutions.

Finally, to accommodate participants who insist on an even greater variety of choices, some sponsors may feel compelled to offer (or to continue to offer) a "window" into a whole mutual fund family, or even a brokerage window. It is probably just as well to avoid these where possible, as the high-risk, high-cost investing often promoted through these routes is not well suited to the long-term investment requirements of a personal retirement plan. While potentially exceptional returns can be generated, they are unlikely to be sustained over long periods of time. Again to minimize confusion with the basic strategic mix and asset class choices, such windows should be communicated at an eye level below the top shelf, and care should be taken to inform participants of the higher risks and costs often associated with the markets available in these windows.

Implementation details: Incorporating institutional "best practices"

The very structure of our proposed set of five mixes on the efficient frontier has an institutional flavor; but to deliver best results, the process needs to mimic institutional best practices to the greatest extent possible. "Institutionalizing" the process consists of adopting professional approaches to:

- Identify the opportunity set of asset classes
- Develop expected returns, risks, and correlations
- Identify suitable risk levels
- Allocate among asset classes
- Select funds or managers
- Rebalance the portfolio and evaluate performance

Identification of opportunity set of asset classes. While typical DC plan implementation skips the strategic tasks and goes right to the selection of funds, well-managed institutions begin by figuring out what broad asset classes need representation. The institutional investor typically considers all of the major components of world market capitalization to be in the initial opportunity set. Judgment is then used to modify this opportunity set to take liquidity and investability considerations into account. For example, emerging market equities and high-yield bonds (which have some liquidity problems) often make the final list, while farmland (which is illiquid and difficult to invest in, despite a large market capitalization) almost never does.

Development of expected returns, risks, and correlations. The professional institutional investor then creates estimates of the return and risk characteristics of each asset class, as well as the expected correlation of each asset class with every other, so that the efficient frontier can be calculated. While not all institutional portfolios are managed by direct application of these quantitative methods, such methods inform the strategic process of every well-managed institutional portfolio.

Identification of suitable risk levels. Defined-benefit pension plans start by modeling their liabilities, which consist largely of post-retirement payments to beneficiaries. The goal of the plan is to maximize the plan surplus (assets minus liabilities), subject to various risk avoidance parameters. The typical choice of a risk level for plan assets is an outgrowth of an asset-liability study that takes all these factors into consideration.

Individual investors also have "liabilities," consisting of their post-retirement cost of living, but every individual is different, and (in contrast to the defined-benefit world) the sponsor must come up with more than one mix. Rather than study plan participants' liabilities, the DC sponsor can simplify the problem by recognizing that individuals' differences—while originating in factors such as personality, time horizon, career prospects, the holding of other assets outside the DC plan, and so forth—largely come down to differences in *risk tolerance*. The number of distinct variations—which are best thought of as risk levels—is probably no more than five. These risk levels can be mapped into efficient portfolios of the asset-class building blocks.

Thus, the many and varied clients of the DC plan sponsor can be well satisfied by a small number of asset mixes. Like sock sizes, a few well-managed asset mixes positioned at intervals along the efficient frontier are good enough; these few positions on the "risk tolerance dial" will satisfy all but the most exacting customers.[16] Certainly, the results will be a huge improvement over those obtained from current practice.

Asset-class allocation. Once the risk level has been determined, asset allocation is a matter of identifying the asset-class mix providing the highest level of expected return for the risk taken. The mean-variance optimization approach that we touched on earlier provides a quantitative solution to the problem and is the method of choice for most institutions. While the specification of an exact method for asset-class choice is beyond the scope of this article, we emphasize once again that DC plans should emulate the institutional best practice, which is to first get the asset-class allocation right, then "staff" each asset class with a mix of appropriately chosen managers.

Fund selection. Unlike many individuals, well-managed institutions have developed fund- and manager-selection disciplines that are more sophisticated and effective than buying the previous period's hot strategy. The first "screen" used in selecting a fund is to determine whether it really gives the investor exposure to the asset class it is supposed to represent. This is followed by a second "screen" which considers the following criteria: the various measures of risk, the magnitude and consistency of past return relative to a well-chosen benchmark and the likelihood that good past performance will be repeated, the people and process involved in managing the fund, and the reasonableness of fees and transaction costs.

Since the surest way of increasing investment return is to reduce costs, fees and transactions costs are critical. Because mutual fund fees are retail, and thus high, they don't reflect or take advantage of the quantity buying power of a large DC plan. It is better to use institutional commingled funds, which are much less expensive and typically get even less so with greater size. Transaction costs, including market impact costs, go up with turnover and size, and can easily exceed 1% per year, all well-hidden in the returns.[17] While it is popular for marketers of funds with good recent historic track records to point out that their fees have been well earned, Sharpe's argument, discussed above, makes it clear that only the most skillful of active managers will surmount their fee-and-cost hurdle over time. Thus, institutional best practice focuses very closely on reducing fees and turnover.

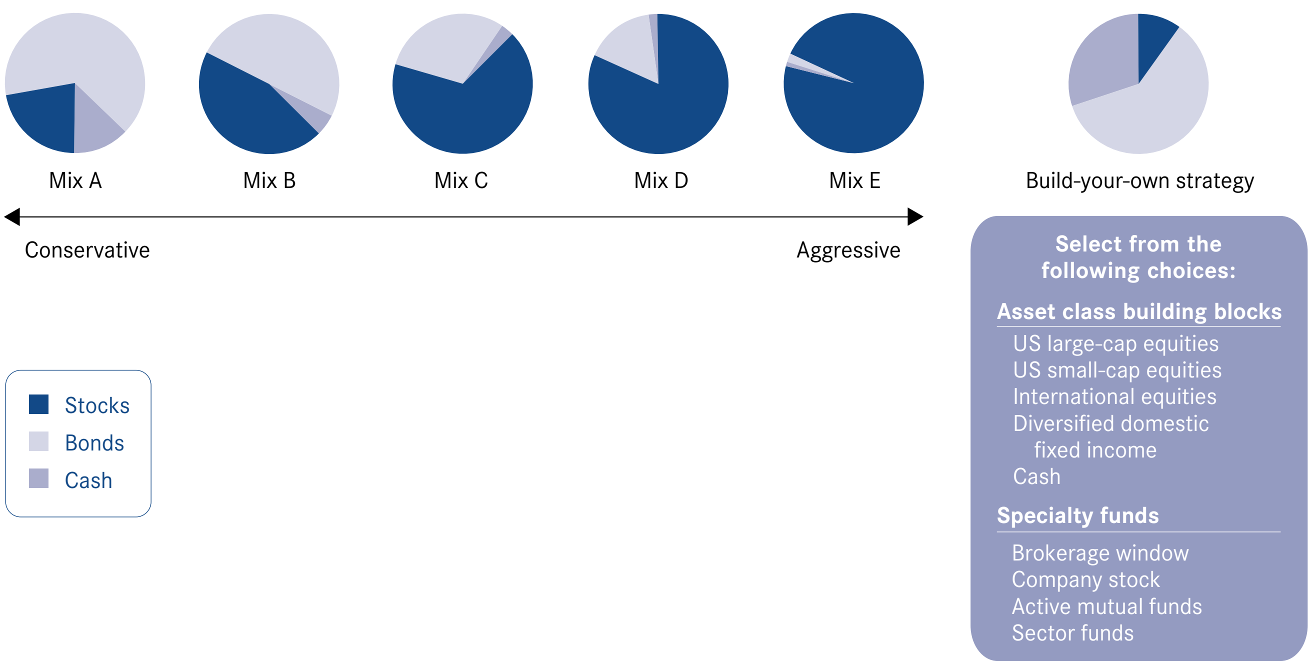
In our proposal for DC plans, each asset-class "building block," or fund of funds, should be assembled using these criteria. Because active fund managers rarely beat their appropriately chosen benchmark consistently over long periods of time, and because fees are an important consideration, index funds figure prominently, a feature also reflective of best institutional practice.[18] Active funds should be included only to the extent the sponsor has a strong belief that the fund will outperform its benchmark index. In such cases, as noted earlier, an asset-class building block might consist of 50% in an index fund and 25% in each of two carefully selected active managers. Tactical asset allocation components can be used as well. They are best regarded as active managers managing against the asset-allocation benchmark, and should be used only within budgeted levels of active risk and, like all active managers, only when there is a strong belief in continued above-benchmark performance.

Rebalancing and performance evaluation. The creator of the pre-mixed portfolios needs to perform ongoing maintenance on them so that the plan participant does not have to. One element of maintenance is regular rebalancing to the policy weights. In addition, changes in asset allocation and fund selection can be made when there are opportunities to improve any of the underlying assumptions used to create the existing strategies. The last quarter century's many advances in quantitative performance evaluation and attribution are easily adapted to the management of pre-mixed portfolios for DC plans.

Having talked much about institutional "best practices," we should be clear that there is widespread agreement on what these are. While plenty of room for disagreement about subsidiary details of the process exists, there is a strong consensus that one should select the asset classes, develop long-term assumptions, calculate the efficient frontier, manage costs tightly, and mix active and indexed approaches—but choosing active only if it is believed to be superior. All the first-order issues have broad acceptance in actual institutional practice, and should be incorporated into DC practice for the benefit of individual investors. The democratization of invest-

Figure 5

Participants choose from the following complete investment strategies:



ment strategies previously accessible only to the wealthy proceeds from these principles. As we said earlier, it's all about asset allocation, appropriateness of investments, and fees.

Educating the participant

The task is not only to design a well-engineered DC plan structure, but to get people to buy into it. No one can be forced to invest in the structure we have proposed, no matter how well the investment vehicle has been designed. To this end, participant education, which, as we noted earlier, has largely been a failure, needs to be recast. Even where lifecycle funds have been offered, existing education paradigms don't tell participants why these funds have a special place in the investment universe (to provide a complete, optimal investment strategy with one fund purchase decision), so people don't buy them. They appear to be just one more set of funds on a long list, indistinguishable from single-purpose funds and having nothing special about them.

In contrast, Figure 5 provides the framework for a better approach to participant education that highlights pre-mixed asset allocation funds. The exhibit leads the eye to these funds *first*, which, as we have emphasized, will serve the participant as well as we know how. This prominent positioning is well justified because the pre-mixed funds represent complete, well-engineered investment strategies, superior in both kind and character to the other available options. They are on the efficient frontier, and thus have risk/return characteristics superior to those of any single-purpose fund. They are the outcome of a thoughtful effort to mix single-purpose funds into an optimal blend using technology and approaches representative of the best practices of the institutional investor.

For those who don't want a pre-mixed strategy, we focus them on a mix-your-own strategy, where asset-class building blocks identical or similar to those used in the pre-mixed choices can be mixed by the participant as desired. By calling it a "mix-your-own strategy," the message is made clear that it should be a *strategy*, and that it should be a diversified *mix*. For the remaining small percentage of participants who are not interested in either option, almost anything else can be offered as long as it doesn't muddy the primary message, which is that strategic choices are strongly preferred.

The education program must emphasize to participants that they can enjoy the same returns enjoyed by institutional investors, at appropriate risk levels, *only* by investing in a mean-variance efficient portfolio. By orienting the investment vehicles and the communications program to issues of investment strategy rather than to issues of fund selection, the DC sponsor is far more likely to motivate participants to choose one of the pre-mixed portfolios such as portfolios A through E in Figure 5, thereby increasing their odds of successfully avoiding the hazards of investing.

3. Every participant a chief investment officer

While "every participant a chief investment officer" is an admirable sentiment, the realization thus far has been terrible. Defined-contribution plan assets have consistently underperformed their defined-benefit plan brethren because of the failure to focus on investment strategy. A DC plan that is designed to be top-down and strategy-oriented, rather than fund-oriented, will deliver higher expected-return-to-risk ratios.

Why hasn't the existing system served DC participants well? Much effort has been expended trying to turn participants into chief investment officers, including risk-tolerance questionnaires, asset allocation and financial planning software, and a vast bulk of educational materials. These efforts rarely work because participants simply lack the time, the knowledge, or the interest to become professional-quality experts in investment strategy. Recent experience with consultants indicates that it costs \$35,000 to \$250,000 in consulting fees and staff time for a corporate pension sponsor to develop an investment strategy for their defined-benefit plan. Replicating the quality and professionalism of the defined-benefit result would require more resources than the vast majority of individuals would or could muster for this effort. Moreover, it is unlikely that many participants are willing—or able—to give more than a token amount of time to making their choices.

What we advocate—to refocus DC plan investing on the strategy decision rather than the fund-choice decision—can be accomplished with only two requirements. First, the family of pre-mixed strategic asset allocation funds must be well-engineered and worthy of being put forward as representing the best practices of sophisticated investors. Second, the communications program needs to concentrate on the strategic decision and de-emphasize the many funds that might be available.

In addition to the long-term risk and return benefits, other benefits of prepackaging a well-engineered family of pre-mixed strategy funds include:

- professional engineering of the optimal strategic asset mix itself
- professional implementation, including
  - determination of the active/index mix
  - professional choice of active managers, if used
  - professional tactical decision making, if used
- systematic rebalancing
- institutional-level fees

…and much more. And while the focus should remain firmly on the strategic choices, there are options available for participants who insist on determining the asset-class mix themselves (fund-of-funds building blocks by asset class), and for participants who insist on determining the *fund* mix (sponsor-selected active and indexed funds).

At great cost to participants, DC-plan investing has retained the baggage of its historical development as an insurance, rather than an investment product. Meanwhile, *institutional* investors have developed a highly successful technology for investing money. By emphasizing asset allocation, selecting appropriate investments, and managing fees carefully, the framework advocated in this article adapts these institutional “best practices” to DC management in a way that is highly beneficial to participants.

It’s a win-win proposition: participants are more assured of achieving their retirement goals, and sponsors are more assured of achieving their employee relations goals.

Endnotes

1 A Watson Wyatt study, summarized in "Investment returns: defined benefit vs. 401(k)," *Watson Wyatt Insider*, June 1998, found that for the years 1990-1995, the 50th percentile of the distribution of differences between defined-contribution and defined-benefit plan returns was a return difference of 2.0%. The size of the gap today may be the same or different; regardless, we believe the gap remains substantial because the underlying causes have not been addressed.

2 Assuming that one's career begins at age 25 and ends at 65, mid-career is at age 45. (Workers tend to earn higher incomes in the later years of their careers, but that is at least partially offset by the longer time for which earlier retirement plan contributions are invested.) Assuming further that the retiree consumes his or her income from age 65 to death at 85, mid-retirement is at age 75. Thus, the average investment-holding period is 30 years (45 to 75).

3 Some participants underallocate to equities out of a conscious desire to avoid risk (in the sense of volatility). However, if their returns turn out to be inadequate to fund their retirement, these investors find out too late that risk has dimensions that are not captured by asset-only volatility.

4 A January 21, 2000, news item on InvestorForce.com reads, "A new report from the Investment Company Institute and Employee Benefit Research Institute finds 401(k) participants are doing a better job of allocating their assets, with 49.8% of total balances in equity funds, 17.7% in company stock, 11.4% in GICs, 8.4% in balanced funds, 6.1% in bond funds and 4.7% in money markets at the end of 1998." To arrive at the equity total, we assume that half of the allocation to balanced funds is in equities.

5 Sharpe, William F., "The arithmetic of active management," *Financial Analysts Journal*, January/February 1991. The concept of active management as a zero-sum game is much older (Sharpe said in the 1960s), but his 1991 article is the best presentation of it.

6 The almost exclusive reliance on mutual funds is probably unwise; institutional commingled funds and institutional separate accounts do the same job much more inexpensively, and in many cases, much better.

7 See Wagner, Wayne H., and Mark Edwards, "Best execution," *Financial Analysts Journal*, January/February 1993. Updated January 1998 in Plexus Group (Los Angeles, CA) Commentary #54.

8 Fixed expenses are about the same whether one has $1,000 or $150,000 in an account. Quarterly statements and annual reports still need to be issued, and phone and Internet support needs to be supplied. By paying for fund administration on a per-head basis, the administrative cost (expressed as a percentage of account assets) can be made much more reasonable for large accounts.

9 We recommend that the sponsor manage the administration and investment management fees to the lowest reasonable total cost. This cost can be charged entirely to the participant if the sponsor desires, or all or just a part of it can be paid for by the sponsor. Charging costs, and nothing more, to the participant is not a fiduciary problem, but a benefits decision.

10 See Waring, M. Barton, "GICs: The large print giveth and the fine print taketh away," *Investing*, Summer, 1991, *Journal of Investing*, Summer, 1992.

11 A cynic would note that, in contrast to DC assets, the poor management of defined-benefit plan assets potentially has a direct effect on the company's balance sheet, explaining the relative care with which the assets have been managed.

12 Although an S&P 500 index fund is widely offered in DC plans, it is seldom positioned to the participants as it is so successfully used in defined benefit plans—that is, as the core large-capitalization US equity holding (or, at the very least, as a benchmark around which such a core holding can be built). Again, while better informed education programs could address this, it is one more detail for the participant to stumble over. Well-engineered lifestyle types of solutions, however, can readily utilize index funds and other core (low residual-risk) funds.

13 Although this description is technically the most accurate, we yield to the less informative but more popular nomenclature of "lifestyle" or "lifecycle" funds at many places in this paper. We note, however, that these terms completely fail to describe the potential, from an investment strategy perspective, that a well-engineered asset allocation fund can have for the individual investor. This is the technology of choice for maximizing expected return at a given level of risk.

14 Waring, M. Barton, and Charles Castille, "A framework for optimal manager structure," *Investment Insights*, Barclays Global Investors, Volume 2, number 1 (June 1998). An updated version is forthcoming in the *Journal of Portfolio Management*.

15 Active risk is measured by the annualized standard deviation of the time series created by subtracting the return of the relevant benchmark from the actual portfolio return.

16 Morningstar has criticized the lifecycle approach as being insufficiently customized. We take the opposite point of view. The likelihood of our approach being adopted hinges on it being simple, cost effective and easily communicated. The benefits of going beyond five portfolios spaced along the efficient frontier are incremental and probably are not worth the added expenses, while the added complexity would discourage the implementation of the program.

17 Transaction costs are incurred through new plan contributions, fund redemptions, fund switching and rebalancing. Prepackaged fund mixes should be managed carefully to minimize costs incurred through trading of securities. Transaction costs can be minimized by using low-turnover strategies; index funds, in particular, have very low turnover because they need to trade only to invest new cash flows, redeem shares, or track changes in the index.

18 Waring and Castille op.cit.

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