

# UNRAVELLING A Knotty Problem

The gap between self-directed plan members' actual and perceived levels of investment knowledge can cause retirement plans to come undone.

BY RICHARD DEAVES

It is well documented that many future retirees make potentially costly mistakes in managing their self-directed retirement accounts: most do not begin saving until very late, and do not save enough once they start.<sup>1</sup> These retirees make investment decisions that even they themselves perceive to be suboptimal (Benartzi and Thaler [2002]). Risk is not a well-understood phenomenon: it is commonly believed that an individual security is less risky than a market index (Benartzi [2001]). Despite the fact that asset allocation decisions are central to a portfolio's long-term success, many individuals allocate money between funds in an ill-informed fashion (Benartzi and Thaler [2001]). People become increasingly hesitant and even paralyzed when offered additional asset choices (Iyengar, Jiang and Huberman [2003]). Ignoring the most basic lessons of diversification, future retirees put far too much money into company stock, and fall prey to recency and representativeness in chasing winners (Benartzi [2001]).

The purpose of this article is to review and document, in the Canadian environment, three of the most important behavioral biases that future retirees often fall prey to. The behaviors examined are: confused perceptions of asset allocation, momentum-chasing, and overconfidence. These are chosen because they are arguably the most potentially damaging behavioral biases afflict-

ing individuals planning for retirement. We make use of a survey commissioned by SEI Investments in the winter of 2004 of more than 2,000 defined contribution (DC) pension plan members, the goal of which was to ascertain satisfaction with current pension plans and desire for changes. Participants were from a broad spectrum of industries, geographical areas and socioeconomic groups.<sup>2</sup> In addition to a set of questions exploring attitudes, a number of additional questions were included in order to consider the extent to which DC plan members were subject to key behavioral biases which have the potential to hamper wise decision-making. While surveys are not uncommon, this one was unique in consciously investigating the extent to which plan members fall prey to behavioral pitfalls.

## Asset Allocation Confusion

It has been observed that the asset allocation decision is the most important one for a client's or investor's portfolio performance (Brinson, Hood and Beebower [1986] and Brinson, Singer and Beebower [1991]). While pension funds have historically opted for a 60/40 stock-bond mix, some commentators today argue for a heavier equity share (Thaler and Williamson [1993]), while others argue for a higher fixed income component (Bodie and Clowes [2003]).

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Richard Deaves is a professor of finance at the Michael G. DeGroot School of Business, McMaster University in Hamilton, Ont.

Conventionally, financial planners recommend an allocation that not only conforms to an investor's risk attitudes but also declines in risk as people approach retirement. Most theory leans in this direction as well.<sup>3</sup>

While some of the debating points are subtle, it is to be hoped that people at least understand asset allocation. One way to ascertain whether people understand this issue is to see if they remain consistent in their choice when they are forced to make their opinions known. When individuals are unsure, they sometimes rely on heuristics or rules-of-thumb which allow them to make what to them seems a reasonable choice. Simonson (1990) and Read and Loewenstein (1995) have documented a "diversification heuristic," whereby people, when unsure, automatically choose "a bit of everything." Benartzi and Thaler (2001) have provided evidence that this heuristic also appears to come into play for decisions as important as asset allocation.

In a survey of University of California employees, participants were first told to allocate their money among five funds, four of which were fixed income funds and one of which was an equity fund. They did so in a manner suggesting a 43% equity share. While there is nothing wrong with this, in a second treatment employees were told to allocate their money among five other funds—this time, four out of the five were equity funds. In this case, the asset allocation suggested a much higher 68% equity share. In fact what was happening was that some respondents were putting exactly  $1/n$ th of their money into each of the  $n$  fund choices, hence the term  $1/n$  heuristic.

Moving from survey to practice, actual allocations tend to fall into line with the survey evidence. Benartzi and Thaler (2001) analyzed a database of the actual decisions made by 1.5 million members across 170 plans. They conclude that there is solid evidence that the menu available affects allocations: when there are a lot of equity choices, people tend to put more of their money into equities.

Turning to the SEI DC survey being analyzed here, respondents were asked two questions designed to see whether they understood asset allocation enough in

order to be roughly consistent in their equity (versus fixed income) allocation. First, they were asked to "imagine you have \$100,000 in your pension ... and all of your old investment choices have been eliminated," and to then allocate the entire amount among a "government bond fund," a "corporate bond fund" and a "stock fund." For example, if a respondent favored a 60/40 stock-bond mix she should set aside \$60,000 for the stock fund.

A second question was identical, except that the three choices were a "bond fund," a "growth stock fund," and a "value stock fund." Consistent asset allocation would imply that the respondent who put down \$60,000 for the stock fund in the first question should allocate the same \$60,000 to the growth and value equity funds collectively in the second question; therefore, the difference in equity allocations between the two questions would be zero. Another benchmark is suggested by the  $1/n$  heuristic. If all adhere to it, then the equity share from the first question should be 33.3% while the equi-

## FREQUENCY DISTRIBUTION OF EQUITY ALLOCATION

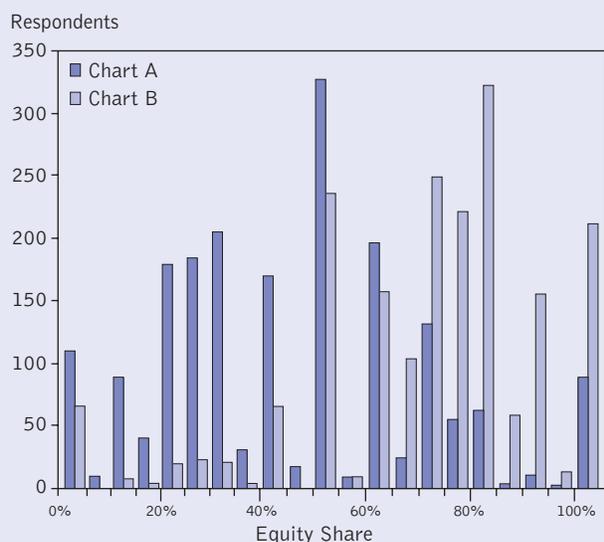


FIGURE 1

Note: Chart A represents the allocation to stocks made when one out of three investment choices is an equity fund, chart B represents allocation when two of three choices are equity funds. All data refer to a 2004 SEI Investments survey of more than 2,000 DC plan members.

ty share implied by the second question should be 66.7%, for a difference of 33.4%.

In Figure 1, we observe the frequency distribution for the equity allocation based on the first question (chart A). Note that the mean equity allocation is 43%. Further, there were substantial concentrations at 0% or 100%, implying some respondents were quite risk-averse while others were ready to bear significant market risk. Also, a preference for rounding to the nearest \$10,000 was apparent, which is why we see many people at 40%, 50% and 60%, but few at 45% and 55%.

The frequency distribution for the second question appears as chart B in Figure 1. Here we see a very different situation: the distribution is now skewed to the left instead of the right, and the mean equity share is a much higher 69%. Only 10.8% of respondents put more than half of their money in the fixed income asset.

The difference between the equity allocations in the two questions, shown in Figure 2, is a highly significant (in absolute value terms) 25.7%.<sup>4</sup> This value is much closer to the  $1/n$  benchmark (33.3%) than to what consistency would imply (0%). From this, and along the lines of Benartzi and Thaler (2001), we conclude that many future retirees are confused by asset allocation decisions and are swayed by whatever fund menu is available to them.<sup>5</sup>

### Momentum Chasing

There is also evidence that investors choose securities and funds based on past performance. This is symptomatic of what behavioral researchers call representativeness (or recency): to those affected, past success implies future success. De Bondt (1993), for example, finds in a survey of a group from the American Association of Individual Investors that more people become bullish if the market has recently turned up. In the context of mutual funds, a number of researchers have found that strong past performance leads to abnormally high inflows of mutual fund money (see Sirri and Tufano [1998] and Deaves [2004a]). Benartzi (2001) relates the high percentage of company stock in 401(k) plans to momentum-chasing. When he divides plans into quintiles based on company stock performance over the previous 10 years, Benartzi finds that employees of the top-performing companies con-

tribute 40% of their discretionary money into company stock versus 10% for the bottom-performing quintile. Does momentum-chasing make sense? The answer seems to be no: in the same paper, Benartzi finds that, in the year after portfolio formation, employees who allocate the most to company stock earn 6.77% less than do those who allocate the least.

Are the DC survey respondents prone to be momentum-chasers? Participants were again asked to allocate \$100,000, this time between two stocks: stock A, with an “average return over the last five years of 5%,” and; stock B, with an “average return over the last five years of 15%.” Further, they were told that “[a]nalysts forecast that both stocks should earn about 10% per year over the next five years.”

Those who are neutral on future direction would go 50/50 in order to maximize diversification. Contrarians would put more than 50% in stock A, while momentum-chasers would put more than 50% of their money in stock B. Is there a correct or “best” option? There is evidence that risk-adjusted returns are positively serially correlated for 12- to 18-month return intervals (Jegadeesh and Titman [1993]). For periods of around five years—as is the case in our example above—the evi-

### DIFFERENCE IN EQUITY ALLOCATION

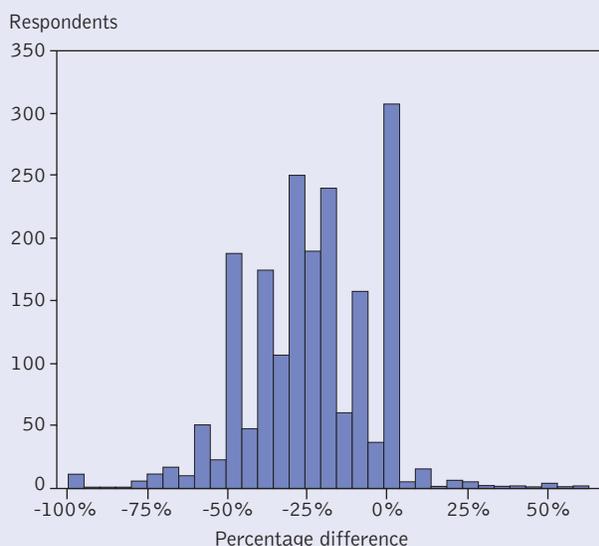


FIGURE 2

Note: This chart represents the difference between allocations when one of the investment choices offered is an equity fund versus when two choices are. All data refer to a 2004 SEI Investments survey of more than 2,000 DC plan members.

dence favors reversals or negative serial correlation (DeBondt and Thaler [1985] and Poterba and Summers [1988]). Behavioral finance models (Barberis, Shleifer and Vishny [1998]) have been formulated to explain this pattern of short-term momentum followed by long-term reversal. So, arguably, the “best” answer is probably to put slightly more than 50% of your money in stock A—not too much more, though, since the evidence on long-term negative serial correlation is indecisive. One must also be wary about lost diversification.

The frequency distribution of the “loser” (stock B) percentage minus the “winner” (stock A) percentage is shown in Figure 3. A high percentage of respondents (63.8%) are momentum-chasers, while 11.6% are contrarians. Both groups surrender some diversification. Still, the mode is at zero: these individuals maximize diversification benefits by splitting their money equally. The mean loser-minus-winner percentage is -32.9%, which is highly significant. Thus the evidence is that, on balance, DC plan members are prone to chasing past winners at the cost of diversification benefits.

### The Overconfidence Trap

Overconfidence is the tendency for people to overestimate their knowledge, abilities and the precision of their information. That most people are overconfident is well-documented by researchers in the psychology literature (Fischhoff [1982]). In a research setting, overconfidence can be detected and even measured in several ways. Some studies have asked people to rate themselves relative to average on certain positive personal attributes such as athletic skill or driving ability. Generally, more than 50% say they are better than average. This is the so-called better-than-average effect (Svenson [1981]). Another strain of overconfidence is called illusion of control (Langer [1975]). Those so afflicted think they have more control over events than can objectively be true. For example, when asked how likely it is that certain good or bad events (such as winning the lottery or dying of cancer) will occur to them, they tend to overestimate the likelihood of good outcomes while underestimating the likelihood of bad outcomes. Another popular way to tease out a discrepancy between knowledge and knowledge perception is to conduct what is termed a calibration test (Deaves, Lüders and Luo [2004]). In one example, peo-

ple are asked to provide 90% confidence intervals for a series of questions which have known (or knowable) answers. Almost invariably, people manage to obtain a percentage much lower than 90% right.

Overconfidence can lead to suboptimal results: Deaves, Lüders and Luo (2004) performed a calibration test and then asked subjects to participate in experimental asset markets. After obtaining information on subjects’ relative level of overconfidence, they succeeded in correlating this with their proclivity to trade and found that those who were most overconfident traded too much. Barber and Odean (2000) conducted a comprehensive study of the trading histories of more than 60,000 U.S. discount brokerage investors between 1991 and 1996 and found that, on average, investors turn over 75% of their portfolios annually. As a result of frequent trading, the net risk-adjusted annual return an average investor received after taking into account transaction costs, bid-ask spreads and differential risk was below the market return by as much as 3.7%. The 20% of investors who traded the most underperformed the market (again on a net risk-adjusted basis) by about 10%. Distressingly, they found very little difference in the gross returns between those who traded frequently and those who traded infrequently. In other

### FREQUENCY DISTRIBUTION OF LOSERS MINUS WINNERS

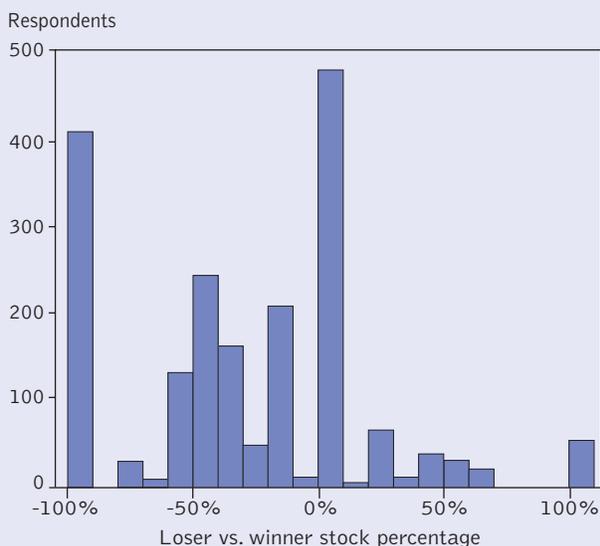


FIGURE 3

All data refer to a 2004 SEI Investments survey of more than 2,000 DC plan members.

words, portfolio choices were not really the problem; rather, it was the cost of frequent trading.

DC plan members were asked two two-part questions to ascertain the extent of their overconfidence. The first part of both of these was an admittedly difficult five-option, multiple-choice question relating to Canadian asset class history. The first part of the first question asked for the average TSX Composite return between 1982 and 2001, with each option spanning a 2% interval. The second part of the first question asked if respondents were 20%, 40%, 60%, 80% or 100% sure of their answer. A similar two-part question followed, this time first asking for the “average long-term Government of Canada Bond yield from 1982 to 2001.”

It should be stressed that the use of these two questions was designed not so much to investigate individuals’ investment knowledge—which was expected to be low, and indeed turned out to be—but more revealingly to test their certainty level relative to their true knowledge; in other words, their overconfidence. Two questions, of course, tell us little about either of these things at the level of any particular individual: twenty or more questions of this type would have been preferable for this purpose. That said, given the sample size we should be able to say something about knowledge versus knowledge perception in the aggregate.

Thirty-two percent of respondents got the first question right; merely guessing would generate 20%. This indicates there is some knowledge here, since the difference between 32% and 20% is highly significant. For the second question, the percentage of correct answers was 8%, which is worse than merely guessing. The likely explanation is that people were surprised by how high the average bond yield has been over the last 20 years, with some younger people clearly having no memory of the high interest rates of the 1980s. Answers, therefore, were often based on recency. On average over the two questions, the percentage of correct answers was 20%, which is equivalent to guessing.

The level of certainty was 41% and 43% respectively for each question, averaging in at 42%. It is natural to define overconfidence as the difference between knowledge perception (the average level of certainty) and actual knowledge (the percentage of correct answers). Simple arithmetic tells us that the average level of overconfidence in this sample was a highly significant 22%.<sup>6</sup>

The frequency distribution for the overconfidence level is shown in Figure 4.

While we must be cautious in our conclusions since only two questions were used to test for overconfidence, the survey data suggest a respondent certainty level which was low (suggesting a high degree of discomfort with respect to knowledge), but one which was still too high given their actual state of knowledge.

### Concluding Remarks

Based on the survey results, it is clear that DC plan members—who in many cases have discretion over how their funds are invested—need guidance, either in the form of education or direct advice. The purpose of increased and improved educational efforts is ultimately to allow workers to make judicious choices on their own; unfortunately, the evidence suggests that the efficacy of educational programs is rather modest (Lusardi [2003]). I suggest two improvements: first, since there is evidence that some demographic groups are more susceptible to certain biases than other groups (Deaves [2004b]), education could be directed to where it is most needed. Second, while some may find this revolutionary, there needs to be recognition that education

### FREQUENCY DISTRIBUTION OF LEVELS OF OVERCONFIDENCE

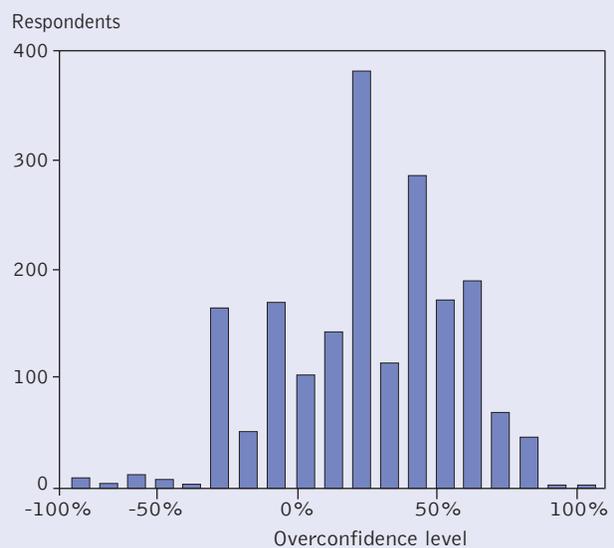


FIGURE 4

All data refer to a 2004 SEI Investments survey of more than 2,000 DC plan members.

should not only be about compounding and risk assessment but also about the tendency to be fixated on recent news and the predisposition to be overconfident.

Many members, because of lack of time or inclination, will never be particularly interested in designing their own portfolios.<sup>7</sup> These people clearly desire advice, not education. In the same survey of DC plan members, it was learned that 79% express interest in “a review of [their] individual company pension by a professional to help [them] choose the right investments and determine how much [they] will have at retirement.” There are several ways to deal with this clientele. One is to guide them into a pre-packaged portfolio (where available), which is appropriately diversified over asset classes and styles, and is consistent with their risk tolerance and circumstances as ascertained by an investor questionnaire and follow-up interview. Another way is to provide as part of the program (leaving aside the issue of who is to pay for this) meaningful contact with an independent financial planner to steer them in the right direction. However it is done, one thing remains clear: help is both desired and needed. ■

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## Endnotes

1. Among numerous other sources see Jonathan Chevreau’s discussion of an Investors Group survey in the *National Post* (*Financial Post* section) on Jan. 15, 2004.
2. More than 2,000 members from 17 different pension plans were surveyed.
3. Theoretically, the main reasons for reducing equity exposure over time are mean reversion in stock returns (Samuelson [1994]) and the ability to vary work effort when younger, especially before retirement (Bodie, Merton and Samuelson [1992]). Viceira (2001) highlights the role of labor income risk.
4. For this article “highly significant” will denote a p-value of 0.000.
5. It is useful to know to what extent demographic characteristics impact risk-taking. For example, using the same survey data as in the present paper, Bhandari and Deaves (2004) find that equity exposure decreases with age and increases with income. These effects are what normative theory would suggest to be appropriate, which implies the existence of some rationality amidst the confusion.
6. Additionally, we can conclude (on a highly significant basis) overconfidence on both questions singly as well as for the package of two questions.
7. A research piece using the same survey data (SEI Investments [2004]) discusses the statistical formation of several distinct attitudinal groups. Two groups, the “Needy” and the “Disengaged,” are quite inactive in their stance towards retirement decision-making.