CHAPTER 19

Assessing Risk Tolerance

A Micro-Behavioral Finance Case Study

GEOFF DAVEY

In 2002, one of the winners of the Nobel Prize in Economics was a *psychologist*—Princeton University's Daniel Kahneman. Kahneman and his close friend and colleague psychologist Amos Tversky, now deceased, are widely acknowledged as having founded the discipline of behavioral finance with their seminal paper, "Prospect Theory: An Analysis of Decision Under Risk."[1] The Royal Swedish Academy of Sciences cited Kahneman "for having integrated insights from psychological research into economic science, especially concerning human judgment and decision making under uncertainty."

Behavioral finance challenges traditional economic thinking on a number of fronts.

- It has proved that psychological costs and benefits are a major influence on the cost/benefit analysis that drives decision making and that these can be very different from the economic costs and benefits.
- It has also demonstrated that decision making suffers from misapplied heuristics (mental shortcuts), biases, and cognitive errors.

At a macroeconomic level, those framing government and corporate policy are starting to consider the realities of behavioral finance's likely impact on outcomes, and others are trying to profit from behavioral finance anomalies in markets.

At a microeconomic level, there has been little change. One would have expected financial advisers to be the group most interested in this

new understanding of individual behavior. Some individual advisers have been quick to see the significance, but the profession as a whole has not. For example, there is nothing yet in competency standards about behavioral finance. At the very least, advisers should have some appreciation of their own financial psychology: first, know yourself. And in giving advice, advisers must be able to relate to their clients' financial psychology.

Yet much of the profession's accepted wisdom seems to be based on a traditional economic view of client motivation—in short, that the primary driver in clients' decision making is a universal desire to maximize expected net wealth. This is despite, for example, the real-world evidence of the existence of whole industries based on exactly the opposite premise. The insurance industry relies on its customers being willing to reduce their present (and expected) net wealth in order to avoid a major but improbable future financial loss. The gambling industry, and lotteries in particular, rely on their customers being willing to reduce present (and expected) net wealth in order to have a chance at a major but improbable future financial gain. And we know that many people buy both insurance policies and lottery tickets—the purchases being examples of desires to, respectively, avoid being poor and have a chance at being rich.

Avoiding being poor and hoping to be rich are both goals that should be addressed, but do they replace the goal of maximizing expected net wealth or are they an addition to it? Further, in advising a client, an adviser should be able to evaluate the relative strength of these desires and then be able to evaluate strategy alternatives in terms of those relative strengths.

Financial planning's promise is to assist clients in the achievement of life goals, with the first step usually being to assist clients in identifying, prioritizing, and articulating them. Unless advisers understand the psychological needs that drive life goals, the goals will not be clearly articulated and the promise will fall at the first hurdle. There is a general legal obligation on any provider of goods or services that those goods or services fit the purpose for which they are provided. A service that promises to assist clients in achieving their life goals but does not include a process for adequate articulation of those goals would seem to be in real danger of failing a fit-for-purpose test. A financial plan is not just about arriving at a destination but also about the journey being undertaken. Ends and means are both important, and psychological needs are relevant to both.

Many advisers have difficulty, however, dealing with the psychological issues inherent in the decisions clients face. This difficulty results partly from a reluctance to address psychological issues at all, partly from an insufficient understanding of psychological issues, and partly from a lack of user-friendly, robust methodologies for managing them. Some advisers exhibit a marked aversion to dealing with client psychology, as evidenced

by overstatements such as "My clients don't want me psychoanalyzing them." But to ignore psychological needs means, in effect, that the plan is for the client's money rather than for the client.

Nowhere is this more evident than in how advisers deal with their clients' risk tolerance. But recent developments make it possible for clients' risk tolerance to be managed using robust, objective tools and methodologies. These developments represent a case study in how mainstream financial planning can apply scientific disciplines to the value-expressive client attributes that affect the financial-planning process.

Managing Risk Tolerance

The desire to feel safe is one of the strongest human needs. When safety is threatened, all else pales in significance until the danger has passed. Any individual is going to be discomforted if he finds himself in a situation that involves more risk than he would normally choose to take, and the bigger the gap between the two, the more intense the discomfort. Indeed, if you ask clients to rate their needs on a low-to-high scale, feeling safe will rate high—and for many clients, at the very top. Yet clients often are unwittingly following adviser-recommended strategies that involve risk beyond their tolerance.

Why is this so?

- ❑ Some advisers pay no regard to risk tolerance at all.
- ❑ Some advisers take the view that "I advise my client to do what I would do if I were in their shoes," thus substituting their own, usually higher, risk tolerance for that of their client.
- ❑ Advisers who've attempted to come to grips with their clients' risk tolerance have been handicapped by the lack of effective techniques for assessing risk tolerance and for applying such assessments in the financial-planning process.

However, it has become possible to manage clients' risk tolerance in the financial-planning process in a manner that's informed by behavioral finance and that employs a user-friendly, robust methodology. This means that not only do advisers have new techniques for managing clients' risk tolerance but both the development of the techniques and their application have led to a better understanding of risk tolerance. Accordingly, managing risk tolerance constitutes a case study in how the financial-planning process may accommodate other psychological considerations. The obligation to consider psychological needs does not mean advisers have to be psychologists any more than they have to be mathematicians, statisticians, or economists to manage investments.

But for those who still feel anxious about the prospect of dealing with psychological needs, the discussion that follows will illustrate that such anxieties are unfounded.

Defining Risk Tolerance

"Nothing tends so much to the advancement of knowledge as the application of a new instrument," said Sir Humphrey Davy, inventor and natural philosopher. If anything, Sir Humphrey understated the case. The advancement of knowledge actually begins with the attempt to build a new instrument. It is difficult to manage something effectively unless you can measure it objectively. So an objective measurement tool is required for effective management.

But before asking what would be an appropriate measuring tool, one must first be clear about what's being measured, and here lies the first difficulty to be overcome. "Risk tolerance" is a term in common usage, but there is no generally accepted definition. Rather it's one of those everyday concepts about which each of us has a slightly different understanding. Asked to define risk tolerance, advisers will say things like:

"It's the level of volatility an investor can tolerate."

"It is where someone feels comfortable on the risk/return continuum."

"It is the amount of loss someone will risk incurring."

While these statements relate to risk tolerance, they do not capture its meaning comprehensively.

A client's risk tolerance is relevant to an adviser in two general sets of circumstances: first, when the client is faced with a decision and, second, when the client is in a situation that involves risk. Decision making always involves choosing between alternative courses of action. There is risk in any course of action where the outcome is uncertain. Depending on the situation, the possible outcomes for the alternative courses of action may be all favorable, all unfavorable, or a mix of both. Thus,

- ❑ in some situations the choice will be between courses of action that have only favorable outcomes—a greater good choice;
- ❑ in other situations the choice will be between courses of action that have only unfavorable outcomes—a lesser evil choice; and
- ❑ in the balance, the choice will be between courses of action that collectively present a mix of both favorable and unfavorable outcomes.

Accordingly, risk tolerance can be defined as *the extent to which a person chooses to risk experiencing a less-favorable outcome in the pursuit of a more-favorable outcome.* With this definition, risk tolerance represents a trade-off on the continuum from minimizing unfavorable outcomes

to maximizing favorable outcomes, not just an upper limit on unfavorable outcomes. "Risk preference" would perhaps be a better label for the attribute being described. "Tolerance" implies that risk is an undiluted negative. However, most people accept the universal truth of "Nothing ventured, nothing gained." It's simply a question of where each individual is comfortable with setting the balance point.

Broadly, risk tolerance can be seen as the sum of all the fear/greed trade-offs—between making the most of opportunities and securing financial well-being, between avoiding regret over losses incurred from taking too much risk and avoiding regret over gains missed through not taking enough risk, and so on. This definition was arrived at through consideration of decision making. Does it apply in the second general set of circumstances, when the client is in a situation that involves risk?

In risky situations, the threshold consideration is whether the client is discomforted by the level of risk being experienced because it's greater than her risk tolerance. If not, there is no issue. If so, then this is actually a decision point, in that the client is faced with the choice between continuing in the situation and trying to remove herself from it, and so the definition works here, too.

Of course, risk tolerance could be defined to mean something else entirely, and sometimes it is. But it would still be important for advisers to understand the value-expressive attribute being discussed here, namely, the extent to which their clients choose to risk experiencing a less favorable outcome in the pursuit of a more favorable outcome.

In fact, it's not sufficient to define risk tolerance in isolation without considering where it fits in relation to other constructs involving risk, and this is an area of much semantic/conceptual confusion. Some of the confusion has arisen because until recently there was no robust, objective technique for measuring risk tolerance. Accepted wisdom about the characteristics of risk tolerance was largely sourced from the personal opinions of individual advisers, based on their subjective observations of their clients. The lack of a robust, objective measurement technique meant that individual observations were unreliable and no large studies could be done. Some of the previously accepted wisdom now needs to be discarded.

For the present, it's time to consider how to measure risk tolerance.

Assessing Risk Tolerance

"Any serious discussion of risk is likely to be reminiscent of the story of the Tar Baby," Harold Evensky tells us in *Wealth Management: The Financial Advisor's Guide to Investing and Managing Your Client's Assets.* "Once you touch, it gets awful sticky." Indeed, says Evensky, "If risk is

a four-letter word describing a concept that looks like a reflection in a mirror maze, how can a wealth manager possibly evaluate a client's risk tolerance?" Strictly, assessing risk tolerance would require observation of an individual's behavior in a variety of situations involving financial risk and comparison of this behavior with that of a representative sample of others in similar situations. Alternatively, various methodologies for hypothetical scenario testing have been proposed. But these tend to be narrowly focused —addressing, for instance, a specific investment scenario—and usually require relatively sophisticated interaction with the testing software by the respondent.

More practically and most commonly, advisers seek information from clients about their experiences, attitudes, values, preferences, and motivations with regard to financial risk and draw conclusions based on the information provided by the client.[2]

In essence, the adviser questions the client until he believes he has a satisfactory understanding of the client's risk tolerance. The adviser should then summarize that understanding in writing, obtain confirmation that the summary is accurate (adjusting the summary as required) and document both summary and confirmation. The confirmed summary becomes the client's risk-tolerance assessment.

During the discussion, the adviser will have consciously or subconsciously scored the client against some norm, probably the adviser's view of his other clients—for example, "Bill is much more risk tolerant than my average client." This is a time-consuming exercise that requires considerable interviewing skills to do well and is not easily auditable—hence, the popularity of scored questionnaires (see "Risk-Tolerance Estimates," at right).

Scored Questionnaires

All scored questionnaires offer the advantages of asking a standard set of questions—making comparisons more objective—and of automatically documenting both questions and answers. Additionally, some direct questions are easier to ask in a questionnaire than face-to-face in an interview.

Questions that are in plain English and jargon-free, so that they can be answered without explanation from the adviser, offer additional advantages:

- ❑ The questionnaire can be completed at the client's convenience.
- ❑ The adviser's time is not required.
- ❑ The adviser cannot (intentionally or unintentionally) influence the objectivity of the output.

Risk-Tolerance Estimates

As a by-product of a 1997 study by Chandler and Macleod Consultants, organizational psychologists, the accuracy of risk-tolerance estimates by clients about themselves and by advisers about their clients was tested. The sample comprised 198 established clients of twenty-five experienced advisers, who used a range of nonpsychometric, industry-standard techniques. The respective correlations were 0.68 and 0.36. These results were consistent with previous studies.

While the clients' self-assessments were reasonably accurate, much accuracy was lost during the processes by which advisers sought to gain an understanding of their clients. A correlation of 0.36 means that one in six estimates were wrong by two or more standard deviations. Put another way, advisers' estimates would have been more accurate if they had made no attempt to understand their clients' risk tolerance but had simply assumed all were average.

This is not a criticism of advisers. Other studies involving managers and subordinates, doctors and patients, teachers and students, et cetera, have shown similar inaccuracies in assessing personal attributes. It's difficult to do this well in the absence of a robust test.

The output is a score (on a scale) and, sometimes, a report. However, not all scored questionnaires are equal. Even judging by appearances suggests a wide range in quality—some look like professional questionnaires and others like tabloid quizzes. How is an adviser to know that a questionnaire is testing risk tolerance, in the first place, and how can the adviser tell whether or not the test results are an accurate assessment of the respondent's risk tolerance?

Psychometrics: The Science of Test Construction

All fields of human endeavor use measurement in some form, and each field has its own set of measuring tools and techniques. Measuring risk tolerance involves particular challenges, first, because there's no physical manifestation of the attribute and, second, because there is no natural unit of measurement.

During the past fifty years, considerable effort has been devoted to establishing standards for questionnaire-based testing. The research was done by psychologists and statisticians, and the discipline they developed is known as psychometrics. Psychometric standards can be applied to questionnaires ranging from opinion polls and market surveys to IQ, personality, and aptitude tests.[3]

In brief, to meet psychometric standards, risk-tolerance testing questionnaires must go through a rigorous development process, comprising usability trials and norming trials.

- ❑ In usability trials, a large pool of questions is tested to measure understandability and answerability on representative samples of the population for which the test is intended. This can involve having researchers sit with the subjects, who are encouraged to verbalize their thoughts as they examine the questions. Questions that seem straightforward are often revealed to have poor understandability and/or answerability.
- ❑ In norming trials, questionnaires comprising questions with high usability are tested on further representative samples and the results analyzed to determine the statistical value of the questions and the scoring algorithm. Questions that appear insightful are often revealed to have little or no statistical value in differentiating one respondent from another.

Typically, development requires multiple loops through both trial processes. A robust questionnaire is, in psychometric terms, one that is valid and reliable, where

- ❑ valid means that it measures what it purports to measure, and
- ❑ reliable means that it does so consistently, with a known level of accuracy.

A risk-tolerance test that meets psychometric standards will display the following characteristics:

- ❑ All questions are directly related to attitudes, values, preferences, emotions, or behavior with regard to situations that involve risk. Questions that relate to the client's circumstances—for example, their stage of life or time horizon—do not meet this criterion (see "The Portfolio-Picking Questionnaire," at right).
- ❑ Questions address financial risk generally, not just investment risk.
- ❑ Questions are in plain English.[4] Terminology that might require explanation is avoided.
- ❑ There are at least twenty questions in the questionnaire, in order to obtain the statistical accuracy required.[5]
- ❑ The results are scored on a normally distributed scale.

The Portfolio-Picking Questionnaire

An expectation that a risk-tolerance questionnaire will include questions about the client's circumstances is a holdover from the early days of financial planning, when advisers commonly used "portfolio-picking" questionnaires to select asset allocations to recommend to their clients. These questionnaires asked a mix of questions about the client's risk tolerance, investment experience, situation, time horizon, et cetera, and produced a score on a segmented scale. Each segment was associated with a particular asset allocation. The asset allocation was described in general terms as was the type of individual it was thought to suit, for example, "You're a prudent investor who wants a balanced portfolio to work toward medium- to long-term financial goals." This description was often referred to as a risk profile.

In its time, the portfolio-picking questionnaire was an improvement on the free-for-all, shopping-list approach to portfolio construction it had replaced. It was a more sophisticated version of the rule of thumb that set the percentage of stocks equal to 100 minus the client's age. Its most obvious flaw, however, was that it didn't provide any basis for determining whether what was being recommended would actually achieve the client's goals or was genuinely consistent with the client's risk tolerance.

Still, the portfolio-picking questionnaire has lingered on for two reasons: First, portfolio picking provided a quick-and-dirty path to making a sale. Despite its having been substantially discredited, its ease of use has made many advisers very reluctant to abandon it. Second, many in the industry do not have a real appreciation of needs-based financial planning. They learned their skills in what has been predominantly a sales culture. Not surprisingly, having grown up with a process built around portfolio picking, they have difficulty seeing its shortcomings. The portfolio-picking questionnaire served a useful purpose in the early days, when there was no better alternative. Now, however, its use could be considered as prima facie evidence of improper practice.

Additionally, the test's publisher should be able to provide details of the test's psychometric characteristics, including its accuracy—for example, scores are ±5 with 90 percent confidence—and evidence that it meets psychometric standards. Commonly used industry-standard questionnaires have typically been developed by compliance, marketing, or technical services personnel without regard to psychometric disciplines. Rudimentary due diligence will quickly establish that they do not test risk tolerance, let alone do so accurately—despite how they might be described by their publishers.

Risk Tolerance Revealed

Though risk and risk tolerance are both complex issues, some of the complexity arises from the semantic/conceptual confusion mentioned previously and some from erroneous beliefs. Two common semantic/conceptual confusions are: First, risk tolerance is sometimes confused with "loss tolerance." How somebody feels about taking risk in choosing between alternative courses of action—risk tolerance—is one thing. How somebody feels if a loss actually occurs—loss tolerance—is another. Risk tolerance is relevant to how someone makes decisions. Loss tolerance is relevant to how someone reacts to an event.

An assessment of risk tolerance is not a prediction of loss tolerance. How a client will react to an unfavorable outcome, loss tolerance, is not predictable with any certainty. A critical factor will be whether or not the outcome was within the client's range of expectations. Did the client actually understand the risk being taken? If not, the client will likely be much more upset than if they had.

Although nobody enjoys an unfavorable outcome, there's a significant difference between being unhappy with the outcome and being unhappy with the decision that lead to the outcome. You may choose to have a birthday party outdoors. If the weather is bad you won't be happy, but you won't necessarily regret the decision and you may or may not make the same decision for next year's birthday.

It is likely, though by no means certain, that clients' reactions to an unfavorable outcome will be consistent with what they said about the level of risk they were willing to take. The better clients know themselves and the more financially experienced they are, the more consistent the reactions are likely to be. In the event of unfavorable outcomes, if proper process was followed, the adviser will be able to take clients back to what they said at the time the decision was made and to show them step-by-step how they decided on the course of action they followed. This may make them feel better—or it may not. But it will demonstrate that they

have no cause for complaint about the advice that led to the decision.

Second, risk tolerance is sometimes confused with "risk capacity." Risk capacity is the amount of money a client could afford to lose without putting the achievement of financial goals at risk. Risk capacity, which more accurately should be called "loss capacity," is an objective financial calculation. It represents an absolute, downside constraint on strategy selection, which must be taken account of, but it's not the same thing as risk tolerance.

Risk tolerance has been the subject of numerous research studies.[6] Not all studies agree on all points. Those points on which a majority, if not all, agree include:

- ❑ Risk tolerance is a personality trait—that is, a distinguishable, relatively enduring way in which one individual varies from another. Test/retest studies have shown consistency over periods of 30 to 120 days.
- ❑ There's evidence of four different categories of risk tolerance: social, ethical, physical, and financial. Individuals behave consistently within category but not across categories. For example, hang gliding will correlate with mountain climbing but not with public speaking.
- ❑ As with many human attributes, risk tolerance is distributed normally. Its occurrence in a population is as would be expected statistically.
- ❑ A number of correlations between risk tolerance and demographic characteristics have been established (see "Demographics," on the following page).
- ❑ The cause of differences in risk tolerance from one person to another is not settled. As with many personality traits, risk tolerance is thought to be influenced by both nature (genetics) and nurture (life experience).

Until the advent of the FinaMetrica Risk Profiling system,[7] the studies involved small samples, narrowly based sample groups (for example, students and academic staff), short time frames, or questionnaires that were not psychometric instruments. However, the FinaMetrica system involves a psychometric risk-tolerance test linked to a separate demographic questionnaire, which tens of thousands of respondents from a broad cross section of the adult population have completed over a period of years.

Analysis of the FinaMetrica database has added to the understanding of risk tolerance as follows:

- ❑ There is no evidence of subfactors in financial risk tolerance—that is, there is no evidence of investment risk tolerance, employment risk tolerance, borrowing risk tolerance, or insurance risk tolerance, for example.

Demographics

The discussion that follows is a *précis* of "An Empirical Investigation of Personal Financial Risk Tolerance" by Robert W. Faff, Department of Accounting and Finance, Monash University, and Terrance Hallahan and Michael D. McKenzie, School of Economics and Finance, RMIT University, which appeared in *Financial Services Review* 13(1). The investigation involved 20,415 FinaMetrica risk profiles completed during the period May 1999 to February 2002 drawn from a broad cross-section of the Australian adult population.

The FinaMetrica database contains information on a number of different demographic factors for each respondent, namely, age, number of dependents, gender, marital status, education, personal income, combined family income, and net assets. A hierarchical regression analysis was employed to assess which of the variables make a significant contribution to risk tolerance. The final hierarchical regression model contains the full set of variables and provides a quantification of the relationship between each of the demographic characteristics and the risk-tolerance score (RTS) according to the following specification:

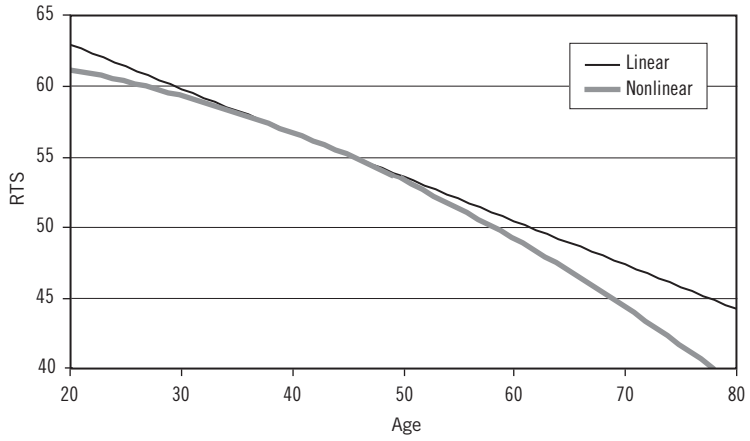
$$RTS_i = \alpha_0 + \alpha_1 D_{i,FEM} + \alpha_2 AGE_i + \alpha_3 AGE_i^2 + \alpha_4 NDEP_i + \alpha_5 D_{i,MARRIED} + \sum_{g=EDU_2}^{EDU_4} \alpha_g D_{i,g} + \sum_{h=INC_2}^{INC_5} \alpha_h D_{i,h} + \sum_{j=CINC_2}^{CINC_5} \alpha_j D_{i,j} + \sum_{k=NASS_2}^{NASS_5} \alpha_k D_{i,k} + \varepsilon_i$$

where RTS_i is the FinaMetrica RTS for respondent *i, AGE* is the age expressed in years, *NDEP* is the number of financial dependents, *D* is a dummy variable used for gender (*FEM*), marital status (*MARRIED*), education (*EDU*), income (*INC*) and combined income (*CINC*), and *a* is the coefficient to be estimated.

The hierarchical regression was structured with the interval-level variables for the demographic characteristics of age and the number of dependents constituting the base-case regression. In light of the results of previous studies, a test for the presence of nonlinearities in the relationship between age and risk tolerance was included in the form of a quadratic age term. The remaining demographic characteristics—that is, gender, marital status, education, income, combined income and net assets, which enter the FinaMetrica database as ordinal-level variables—were dummy coded and entered sequentially as separate sets of predictors, judged in order of importance, having reference to past research.

Gender is a significant determinant of risk tolerance, and a female will exhibit an RTS of 6.2 points lower than a demographically equivalent male. Similarly, age and marital status are found to be significant determinants of the RTS. While marriage simply decreases the RTS by two points, the relationship between age and RTS is revealed as more complex. The regression output shows that the linear age variable is insignificant, whereas the nonlinear age term is highly significant.

FIGURE 19.1 *Forecasts Risk-Tolerance Scores for Different Ages*



The nonlinear forecast, **FIGURE 19.1**, represents the base-case individual (an unmarried male with no dependents, personal and family incomes of less than $30,000, and net assets of less than $50,000) plus an adjustment for age as given by the quadratic age coefficient. The linear forecast represents the base-case individual excluding the quadratic age coefficient.

The series of dummy variables capturing the level of income of a respondent (D_{INC}) were all individually significant and positive, as were the net asset (D_{NASS}) dummy variables. The estimated results indicate that the RTS of a respondent generally increases as income and assets increase. A Wald test of coefficient

DEMOGRAPHICS (CONTINUED)

equality rejects the null hypothesis of coefficient equality for the income, combined income, and net asset dummy variables, respectively. This positive relationship between income, assets, and risk tolerance does not appear to be uniform. Specifically, higher levels of income are found to be associated with successively higher scores except for the top income bracket (greater than $200,000.) Although the increment to the RTS over the base case is still positive, it is less than that found for the income bracket preceding it ($100,000 to $200,000). However, a Wald test of coefficient equality suggests this difference is not statistically significant. Further, the number of dependents was found to be significantly associated with the RTS, although the negative impact on the RTS is small.

Not all of the demographic characteristics were found to be significant. For education, at least a trade/diploma level of education was required before a significant increase in the RTS was observed. Similarly, a combined income of at least $50,000 is required before the RTS is positively influenced.

Overall, these results suggest that gender, age, number of dependents, marital status, tertiary education, income, and wealth are all related to risk tolerance. The results for gender, education, and income are consistent with the earlier literature. It should not be concluded, however, that differences in scores can be explained solely by demographic factors; rather, these are a general influence. For any particular set of demographic factors, respondents displayed a wide range of risk-tolerance scores.

Thus, although understanding the influence of demographic factors may be of general interest to advisers, it will not affect the advice given to a particular client. However, this understanding does enable demographic factors to be excluded from more precise exploration of other influences on risk tolerance (see "Major Events").

- ❑ Demographic correlations have now been examined rigorously on a large scale. Some previous findings have been confirmed, some refined, and others overturned (see "Demographics").
- ❑ Major world and financial market events have been shown to have no significant impact on risk tolerance (see "Major Events," page 346).

Behavior and Risk Tolerance

Imagine your clients driving to a country wedding. Suppose that halfway through a tight bend, the asphalt suddenly changes to gravel and they nearly crash. Your clients' immediate reaction will depend on how shocked they are. And that depends on how risky they thought it was to be driving on that road, at that time, at that speed. Before the near miss they will have been traveling at a speed that balanced their driving risk tolerance, their perception of the driving risk, and their goal of arriving on time for the wedding.

Risk tolerance is relatively stable, but perceptions of risk can change in an instant. If badly shocked by the near miss, your clients may actually pull over until their hearts stop racing. Or perhaps they'll proceed but more slowly than before. Eventually they may get back to the speed at which they were traveling but possibly not through bends. If they now want to change their driving speed, it will be because their perception of the driving risk has changed. They simply didn't realize that there were unsealed sections in the road. In what they now perceive to be a more risky situation, your clients must decide whether to proceed at the old pace and risk more shocks or to slow down and risk being late for the wedding.

From this example, it's clear that risk tolerance is not the sole determinant of behavior in situations that involve risk. Behavior will be a function of the goals being sought, the perceived risk, and risk tolerance. In a given set of circumstances, a change in behavior could be caused by a change in goals, a change in perceived risk, or a change in risk tolerance. While risk tolerance is relatively stable over time, it's not unchangeable. There is a moderate general tendency for risk tolerance to decrease with age, and life events can also have a significant positive or negative impact.

When the bull market turned to a bear market, some clients wanted to change their investment strategies. Some advisers interpreted this as resulting from a change in risk tolerance. However, given the data described in "Major Events," the desire for change seems far more likely to have arisen from changed perceptions of risk and/or changed goals than from changed risk tolerance. Personality traits do change, but usually only slowly over time. Nonetheless, a significant life event can trigger a major change, and in some cases this can be almost instantaneous.

A bear market is an environmental event. Whether or not it constitutes a life event for particular individuals—either positive or negative—depends on their circumstances. For example, the significance of the event to a pre-retiree who bet his life savings on high tech in 1999 will be very different from what it will mean for a pre-retiree who followed a balanced strategy through the 1990s and into the 2000s. Overall, there is no evidence that the bear market has had any significant impact on risk tolerance.

Major Events

An Australian study that involved time-based analysis of 11,421 client risk profiles (average score was 55.3, with standard deviation of 12.4) completed during the period May 1999 to February 2002 showed no evidence of any statistically significant change (see **FIGURE 19.2**).

The data in the table are for clients of Australian advisers. A 1997 study established that there were no statistically significant differences in risk tolerance between U.S. and Australian populations. Australian markets have been through a boom/bust cycle similar in timing to that of U.S. markets but not as severe. If one considers clients of financial advisers as a population, Figure 19.2 can be seen as representing the results of successively sampling this population on a quarterly basis. (In 2004, the researchers who conducted the study described in "Demographics" were applying the results of that study to exclude demographic influences from a study of the effect of major events on risk tolerance. Preliminary results indicate no changes of significance to financial advisers in advising clients.)

Further, in a website survey of readers of the Australian *Personal Investor* magazine conducted during January and February 2003, respondents were asked how their risk tolerance had changed over the previous twelve months. The results (n=985) were:

9%	Decreased significantly
78%	Not changed significantly
13%	Increased significantly

Individuals' self-ratings of their risk tolerance are quite accurate (see "Risk-Tolerance Estimates," page 337).

Education and Risk Tolerance

It's generally acknowledged that educating clients about risk is desirable. To the extent that such education reduces fear of the unknown, it can be expected to reduce perceived risk and therefore to cause clients to choose courses of action that they previously would have considered too risky. However, the opposite can also be true. During the climate of irrational exuberance in the bull market of the late 1990s, it was common for investors to underestimate risk. Education about risk would then,

FIGURE 19.2 *1999–2002 Quarter-by-Quarter Risk-Tolerance Scores*

PERIOD		SCORES		
FROM	TO	COUNT	AVERAGE	STD DEV
05/99	07/99	372	54.9	13.3
08/99	10/99	457	56.6	11.9
11/99	01/00	462	55.3	12.2
02/00	04/00	811	54.3	12.7
05/00	07/00	1052	55.2	12.8
08/00	10/00	1102	55.1	12.6
11/00	01/01	968	55.2	12.5
02/01	04/01	1289	55.2	11.9
05/01	07/01	1616	55.8	12.0
08/01	10/01	1593	55.5	12.1
11/01	01/02	1355	54.9	12.8

in many cases, have caused clients to think twice about courses of action that otherwise appeared attractive.

To the extent that education causes changes in behavior, it's far more likely to do so because perceptions of risk have changed than because risk tolerance has changed. Even the most knowledgeable individuals can still have low risk tolerance.

Applying Risk-Tolerance Assessments

Know the Client

A risk-tolerance test report does not replace discussion between adviser and client. Rather, it's an objective starting point for that discussion. The results of the test process are not set in stone. The first step in discussing the test report is to ask the client whether or not she believes it's an accurate description of her risk tolerance. Clients may wish to make minor amendments, in which case they would sign off on the amended report, or to retake the test.

The report from a psychometric risk-tolerance test should be information rich: equivalent to a precise summary, quantified against statistical norms, of a thirty-minute discussion about financial risk between the client and an expert interviewer.

Each statement in the report should be directly linked to answers given in the questionnaire and/or statistical norms.[8]

The report should provide fertile ground for advisers in developing an in-depth knowledge of their clients.

- ❑ Of course, there will be a normally distributed score (on a segmented scale), which provides basic quantification—for example, this person tests as being more or less risk tolerant than *x* or *y* percent of the population.
- ❑ Segmenting the scale allows generic descriptions of those within segments to be developed from analysis of completed questionnaires.
- ❑ Where a client has given answers that are different from those typically given by others in the same segment, the report should highlight these answers as differences, leading to extended discussion.
- ❑ Additionally, answers to specific questions can lead to very illuminating discussion. For example, the questionnaire will probably ask clients to indicate the level of risk they have taken in the past and the level of risk they're now comfortable taking. Any difference provides an ideal "tell me more" opportunity.

Typically, clients respond very favorably to this type of risk-tolerance evaluation. Survey responses show that they find the process of completing the questionnaire and then reading the report gives them a better understanding of themselves in relation to risk and return issues. Further, they appreciate that an independent, objective analysis of risk tolerance adds to the adviser's understanding of them as individuals.

For a completed sample of the FinaMetrica risk-tolerance questionnaire and the resulting Risk Profile report, go to www.risk-profiling.com/downloads/sample.pdf.

Couples

In couples, there is usually a difference in risk tolerance between partners. Each couple is mostly aware that the difference exists and knows which of the two is more risk tolerant. However, the magnitude of any difference is often unknown. A psychometric risk-tolerance test provides an objective measure of any difference. Further, by comparing questionnaire answers and reports, the couples are able to see exactly where and how the difference arises, which makes finding a mutually acceptable way forward that much easier. Some advisers cite the advantages in dealing with couples as the most valuable benefit of psychometric testing.

Trade-Offs and Gap Analysis

The personal financial-planning process is based on obtaining the client's properly informed commitment to a set of trade-offs between conflicting alternatives. Effective trade-off decisions can be made only when the elements of the trade-off have been separated and can be clearly understood and compared.

A key trade-off decision is between comfort with financial risk and the financial risk required to achieve goals. Analysis of clients' goals, needs, and priorities, in light of their current and anticipated financial resources, and the financial environment (commonly referred to as "gap analysis") often demonstrates that the clients' goals are unlikely to be satisfied from their resources at the level of risk they would normally choose to take. In such circumstances clients may decide to

- ❑ take more risk than they would normally choose;
- ❑ reduce, defer, or forgo goals; and/or
- ❑ apply more resources to achieving future goals.

The adviser can guide, illustrate alternatives, discuss consequences, and the like, but the decision is ultimately the client's to make.

Relating Risk Tolerance to Planning Alternatives

In many cases, once advisers have an objective assessment of risk tolerance it's a relatively straightforward step to relate that to the objective risk in the planning strategy alternatives being considered. However, the advent of psychometric risk-tolerance testing has given rise to databases of completed tests, which make possible the development of new knowledge through further research. In particular, it's now possible to develop algorithms that relate risk-tolerance scores to investment strategy alternatives. One such algorithm[9] is illustrated in **FIGURE 19.3**, where the risk-tolerance scoring scale has a mean of 50 and a standard deviation of 10.

FIGURE 19.3 *% Growth Assets by Risk Tolerance Score (n=20,709)*

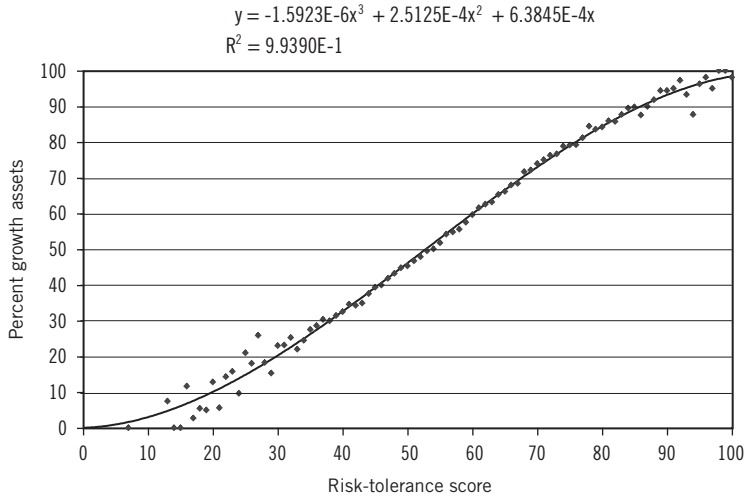


FIGURE 19.4 *% Growth Assets*

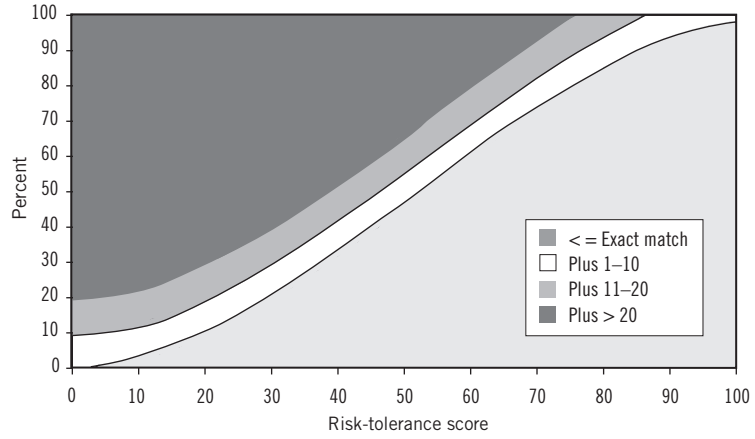


FIGURE 19.5 *% Growth Assets to Risk Tolerance*

Enter the % of growth assets in the portfolio to see the comfort/discomfort risk-tolerance score ranges for that portfolio.

Enter % growth assets	60%

RISK-TOLERANCE SCORE RANGES	
Comfort	> 59
Marginal comfort	59–53
Marginal discomfort	52–45
Discomfort	< 45

In a well-constructed diversified portfolio, the level of risk is determined, broadly, by the defensive/growth split, where cash and bonds are defensive and stocks and real estate are growth. However, risk is not highly sensitive to the proportion of growth assets. Let's suppose that a client is comfortable with 50 percent growth. Increasing the proportion to 51, 52, or 53 percent is not going to increase the level of risk as perceived by the client. In fact, the increase in risk will be noticeable only at around 60 percent growth, so discomfort is likely to begin to occur only when the proportion has gone beyond 60 percent. But by 70 percent growth, this client will be entering the discomfort zone. Hence, there is effectively a transition from comfort to discomfort, which, when applied to the algorithm illustrated in Figure 19.3, gives the comfort/discomfort chart in **FIGURE 19.4**.

Figure 19.4 provides an apples-to-apples comparison between portfolio risk and risk tolerance. The algorithms on which the chart is based allow the construction of calculators that allow readings to be done simply and precisely. For a given portfolio, risk-tolerance score ranges can be calculated as shown in **FIGURE 19.5**. Similarly, for a given risk-tolerance score, portfolios can be categorized as shown in **FIGURE 19.6**.

The ideas illustrated in these figures show that it's possible to objectively link the soft data about psychological needs to the hard data required in the financial-planning process.

FIGURE 19.6 *Risk Tolerance to % Growth Assets*

Enter the risk-tolerance score to see the comfort/discomfort ranges for the % of growth assets in a portfolio.

Enter risk-tolerance score	50%

% GROWTH ASSET RANGES	
Comfort	< 47%
Marginal comfort	47%–56%
Marginal discomfort	57%–66%
Discomfort	> 66%

The Way Ahead

Financial planning has always been a blend of art and science. This chapter demonstrates that the art of financial planning is enhanced by taking a sequential, scientific approach to a particular psychological attribute—the client's risk tolerance.

The steps include:

- ❑ Use basic research to distill an understanding of the construct being considered.
- ❑ Use the appropriate disciplines to build a test instrument.
- ❑ Use large numbers of test results to fine-tune the understanding of the construct and the instrument.
- ❑ Seek a methodology for linking test results into the financial-planning process.

Essentially, managing risk tolerance is a problem to be solved. Because it requires a concentrated application of disciplined, clear thinking, the very effort of attempting to solve the problem has led to a greater understanding of it. Additionally, the development of psychometric risk-tolerance testing is itself an important step. Of course, this progress doesn't mean that managing risk tolerance is now a closed book. What has been presented here can be seen as second- and third-generation thinking. Although this is sufficient to facilitate a professional approach, the fourth, fifth, and sixth generations are still ahead of us.

The growing interest in lifestyle planning and in remodeling practices to improve the adviser's own quality of life indicates that the profession is

thinking more broadly about goals, needs, and priorities than it has in the past. Neither client nor adviser is well served by a mechanical application of traditional economic thinking, no matter how technically sophisticated. Behavioral finance provides the promise of a better future for the profession and those it serves. It's not merely an intellectual curiosity that sits on the periphery. Rather, it is central to the very core of financial planning's purpose and processes. It redefines both the ends being sought and the means by which they can be achieved. We can't be confident that all behavioral finance issues are known, let alone settled, and there are, as yet, few user-friendly, robust tools. However, the fact that robust disciplines can be applied to the complex task of managing risk tolerance indicates the way ahead.

Interestingly, though the initial steps were taken by those schooled in economics or psychology, the development since then has been done by those whose primary discipline is financial planning—which is as it should be. Does anyone have a greater interest in the application of behavioral finance in terms of individual consumers than a financial planner? Although the framework within which risk tolerance was tackled may not be appropriate for resolving other behavioral finance issues, it does prove that behavioral finance issues can be properly taken into account in mainstream financial planning. Indeed, behavioral finance is the new frontier for financial planning. It offers exciting challenges and opportunities to improve the practice of financial planning, to add to depth to the role of financial adviser, and, most important, to enhance the benefits to clients.

Chapter Notes

1. Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica* 47 (1979): 263–291.

2. For practical reasons, what is actually being assessed is information provided by clients regarding their risk tolerance rather than their risk tolerance, per se. However, to simplify, the expression "assessing risk tolerance" is used as shorthand for "assessing what clients say in regard to their risk tolerance."

3. A detailed discussion of the application of psychometrics in risk-tolerance testing can be found in V. J. Callan and M. Johnson, "Some Guidelines for Financial Planners in Measuring and Advising Clients About Their Levels of Risk Tolerance," *Journal of Personal Finance* (August 2002): 31–44, a copy of which can be downloaded at www.risk-profiling.com/Downloads/Measuring RiskTolerance.pdf.

4. To meet psychometric standards, all questions must be worded in plain English, typically not greater than high school standard. Planners often see such questions as simplistic, especially when compared to the level of discussion they would normally have with their clients. However, the purpose of these questions is to get an accurate assessment of risk tolerance as an objective starting point for building the detailed understanding that comes from more probing discussion. Additionally, it's easy for planners to underestimate the knowledge gap between their clients and themselves, and clients can be reluctant to say that they don't really understand what the planner is talking about.

5. The accuracy of a questionnaire is a function of the accuracy of the individual questions and the square of the number of questions. Among other things, norming trials test the correlation (accuracy) of individual questions. The correlation for a typical risk-tolerance question is such that around twenty questions are required to give accuracy consistent with psychometric standards.

6. Over the past thirty years—the past ten in particular—risk, risk tolerance, and risk-tolerance testing have been the subject of numerous academic and other studies described in hundreds of papers, articles, and books. A partial list of references can be found at www.risk-profiling.com/references.htm. Additionally, this chapter draws on unpublished studies carried out by: Dr. Michael J. Roszkowski, the author of "The American College's Survey of Financial Risk Tolerance"; Hamada Elsayed and Jarrod Martin, Chandler & Macleod Consultants, Organisational Psychologists; Drs. Austin Adams and Jim Bright, Applied Psychology Unit, University of New South Wales School of Psychology; and Dr. Robert Faff, Department of Accounting and Finance, Monash University, and Terrence Hallahan and Dr. Michael McKenzie, School of Finance, RMIT University.

7. The FinaMetrica Risk Profiling system comprises a test of financial-risk tolerance and a methodology for incorporating the test results into the financial-planning process. The test was developed in accordance with and meets internationally accepted psychometric standards. The Web-based system was launched in Australia in October 1998, in the United States in June 2002, and in the United Kingdom in April 2004.

8. With personality and aptitude tests, many critics are disconcerted by the frequent lack of an apparent connection between the questions asked and the conclusions drawn. Typically, the questions are used to assess where an individual fits into a preexisting model of behavior, and the report is then couched in terms of that behavioral model. Often respondents are unaware that this is the process being followed and are understandably upset when they see negative conclusions being drawn about them from answers they gave to seemingly innocuous questions. Respondents may feel that they have been tricked into disadvantaging themselves. One of the characteristics of a nonpsychometric risk-tolerance test is that the report will contain statements that seem to have been plucked out of thin air (in much the same way as a horoscope does).

In a psychometric risk-tolerance test, the respondent's answers are compared with those of a sample group. There should be nothing in the report that could not have been derived directly from the answers given by the respondent or the sample group.

9. An explanation of the derivation of this algorithm can be found in Appendix B of the document at www.risk-profiling.com/Downloads/User_Guide_To_Linking_Spreadsheet.pdf.