

# Assessing Risk Tolerance for Asset Allocation

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One of the key steps in investment planning for an investment advisor is the assessment of a client's risk tolerance so that a portfolio can be structured that is consistent with the client's willingness to trade risk for reward. Since the first published risk tolerance questionnaire appeared nearly 20 years ago, the use of risk tolerance questionnaires by financial planners and private client investment managers has become increasingly common.<sup>1</sup> A review of the questionnaires currently in use shows that virtually all of them focus on the asset allocation decision—that is, the process of distributing portfolio investments among the various available asset categories such as money market instruments, bonds, stocks, real estate and other assets. The result of the risk tolerance questionnaire typically is a recommended percentage allocation to each of these asset classes.

Virtually all experienced financial plan-

This article proposes a risk tolerance questionnaire that develops asset allocation guidelines as a dual function of risk tolerance and time horizon. Although no risk tolerance questionnaire by itself can provide a definitive answer to the asset allocation question, it can be a useful instrument for making a first pass at an optimal solution and can be a valuable supplement to standard optimization modeling or Monte Carlo simulations. At a minimum, the questionnaire approach provides a useful starting point for discussion of the implications of a client's risk tolerance for his or her asset allocation choices.

ners and investment managers would agree that a questionnaire by itself cannot possibly lead directly to a definitive asset allocation plan. We certainly would agree with this sentiment. In our practice, we use our risk tolerance questionnaire as the basis for beginning a dialogue with our clients about their risk tolerance and return needs. The questions to which we ask them to respond force us to focus on the important aspects of our clients' investment concerns and provide a springboard for a detailed discussion of our approach to investment management and an explanation of our typical asset allocation configurations.

We normally meet with potential new clients at least twice before we assume responsibility for managing their investments. Typically, we use the first meeting to familiarize ourselves with the client's financial situation, explain our investment philosophy and gather detailed information from the client. Clients normally complete

the risk tolerance questionnaire as part of the first meeting or as a "homework assignment" prior to the second meeting. We then use the second meeting to discuss more detailed information about the types of investments we will be making for them, the timing of the investments and any other issues of concern to us or the client. The results of the risk tolerance questionnaire provide a key component of the information we use to begin a relationship with a new client, but these results contribute only one facet of the client relationship.

This article proposes a new approach to using risk tolerance questionnaires which (1) offers a unique solution to dealing with the impact of time horizon on risk tolerance and (2) suggests an asset allocation appropriate to investors' risk tolerance. This questionnaire is a modified version of the questionnaire that appeared most recently in the *Journal of Accountancy*.<sup>2</sup> The asset allocation guidelines appropriate to an

investor's risk tolerance have been developed over a period of years for use in the authors' investment management practice.

## A Function of Time Horizon

The typical approach to handling time horizon is to pose a number of questions to potential investors, some of which deal with time horizon, then score all questions, add up the score and recommend an asset allocation based on the total score. Some more sophisticated versions may treat time horizon as a separate issue with a separate score, but the net result is still to add up all the points and base asset allocation recommendations on the total points. The risk tolerance questionnaire described here improves the handling of time horizon by developing asset allocation recommendations as a function of time horizon, rather than simply including a time horizon question as part of the questionnaire.<sup>3</sup> After answering all of the risk tolerance questions, an investor is asked to identify his or her investment time horizon as short-term (three years or less), intermediate term (four to seven years), or long-term (more than seven years).

An investor with a short-term horizon who has the same risk tolerance score as an investor with a long-term horizon is assigned a much more conservative asset allocation (that is, more debt, less equity) than the long-term investor. Similarly, two investors with the same time horizon would be assigned different asset allocations depending on their relative aggressiveness as identified by the risk tolerance questionnaire. For example, a highly risk-averse investor with a long-term time horizon is offered a mix with 50 percent invested in fixed income securities, while a highly aggressive investor with a long-term time horizon would be offered an asset allocation mix with a 10 percent allocation to fixed income investments.

The asset allocation approach devel-

EXHIBIT 1		
Post-World War II Investment Returns (1946–2001)		
	Average Annual Compound Return	Year-End 2001 Cumulative Wealth Index
Inflation*	4.1%	\$949
U.S. Treasury Bills	4.8%	\$1,381
Intermediate-Term Government Bonds	5.9%	\$2,478
Long-Term Government Bonds	5.5%	\$2,005
Long-Term Corporate Bonds	5.9%	\$2,478
Large Company Stocks	12.0%	\$57,044
Small Company Stocks	13.7%	\$132,613
*The index for inflation shows what \$100 would have grown to if it had kept pace with inflation.		
<b>Cumulative Wealth Index = value of \$100 invested at the beginning of the period and held to the end of the period.</b>		
Equity Risk Premium (Stocks – Bills)		6.9%
Small Stock Premium (Small Stocks – Large Stocks)		1.5%
Bond Default Premium (LT Corporates – LT Governments)		0.4%
Bond Horizon Premium (LT Governments – T-Bills)		0.7%
Data Source: Ibbotson Associates, <i>Stocks, Bonds, Bills and Inflation, 2002 Yearbook</i> , (Chicago: Ibbotson Associates, 2002).		

oped here is based on two intuitively appealing and generally accepted assumptions. First, it assumes that the capital asset pricing model (CAPM) is a reasonable description of reality and that risk and return go hand-in-hand in the capital markets: the only way to increase long-run return is to move out on the risk spectrum. The CAPM measures risk quantitatively in terms of standard deviation of return; the higher the standard deviation of return, the riskier the investment. The second assumption is that the capital markets are reasonably efficient over the long run and that future return spreads will be similar to historical spreads, at least in direction if not exactly in magnitude. The absolute level of future returns obviously will vary, but one can be reasonably confident, for example, that bonds will offer higher returns than money market instruments, and stocks will offer higher returns than bonds. The logical implication of

these two assumptions is that any asset allocation model should take a strategic approach to asset allocation and any resulting portfolio should offer broad diversification among asset classes.

Exhibits 1 and 2 present some historical return data for the post-World War II period, 1946–2001. This 56-year period provides some useful insights on investment returns in a long run but still contemporary period, overlapping most clients' adult lives. The data show the average annual compound rates of return over this period along with a cumulative wealth index showing the growth of a \$100 investment made at the beginning of the period. The exhibit also shows the historical return spreads of stocks over Treasury bills (equity risk premium), small stocks over large stocks (small stock premium), corporate bonds over government bonds (default premium) and long-term government bonds over Treasury bills

## EXHIBIT 2

## Overlapping Post-World War II Returns (1946–2001)

	Small Stocks	S&P 500 Stocks	Intermediate Treasury Bonds	Treasury Bills	Consumer Price Index
Last year (2001)	22.8%	-11.9%	7.6%	3.8%	1.6%
Two years ago (2000)	-3.6%	-9.1%	12.6%	5.9%	3.4%
Last 2 years (2000–2001)	8.8%	-10.5%	10.1%	4.9%	2.5%
Last 5 years (1997–2001)	11.8%	10.7%	7.3%	4.9%	2.2%
Last 10 years (1992–2001)	15.6%	12.9%	6.7%	4.6%	2.5%
Last 20 years (1982–2001)	13.8%	15.2%	9.9%	6.1%	3.2%
Last 30 years (1972–2001)	14.9%	12.2%	8.5%	6.7%	5.0%
Last 40 years (1962–2001)	14.3%	10.9%	7.5%	6.1%	4.5%
Last 50 years (1952–2001)	14.4%	12.0%	6.5%	5.3%	3.9%
Last 56 years (1946–2001)	13.7%	12.0%	5.9%	4.8%	4.1%

(bond horizon premium). These kinds of data are very useful in helping clients explore the question of what is a reasonable long-term return expectation based on actual historical returns. The long-term results were particularly helpful during the 1990s “bubble,” when many clients seemed to think that 20 percent-plus each year was a reasonable return to expect from the stock market. The data may be very helpful in explaining why “mean reversion” may lead us to a reasonable expectation of stock returns of less than the historical average of 12 percent for the next few years.

Exhibit 2 shows overlapping historical returns for the last 1-, 2-, 5-, 10-, 20-, 30-, 40-, 50- and 56-year periods of the post-World War II era. These data are useful to illustrate the relative stability of long-run returns compared with the stock market decline since calendar year 2000, and may help explain to clients why the stock market is still a reasonable investment option for their long-term investment dollars. The data provide a useful historical perspective against which to assess the most recent “bursting of the bubble” in the stock market.

### Assess Risk Tolerance First

In counseling individual investors, it is often useful to assess their risk tolerance before addressing return objectives. The most important point for them to understand is that there really is no such thing as a risk-free investment. In planning an investment portfolio, investors do not have a choice of risky versus risk-free investments. Even if they choose to leave their funds in the bank or invest all of their money in Treasury bills, they will face serious purchasing-power risks since these types of investments generally fail to keep pace with inflation on an after-tax return basis. Such “risk-free” options virtually guarantee loss of purchasing power of investment capital over time. A key part of the investment asset allocation process is to decide what types of risk the client is willing to accept and the amount of each type of risk. The overall objective of asset allocation should be to earn the highest possible return available from investments that are compatible with the investor’s risk tolerance, time horizon, and income and liquidity needs.

The asset allocation model proposed

here focuses in six generic categories of investment assets: money market instruments, U.S. bonds, international bonds, U.S. stocks, international stocks and real estate investment trusts (REITs). Within the U.S. bond category, allocations are made between Treasury and corporate bonds (municipal bonds may be substituted for corporates where appropriate). Within the U.S. stock category, allocations are made among index funds, large-cap growth and value funds (or stocks), and small-/mid-cap growth and value funds (or stocks).

These asset categories are selected because reliable long-term risk and return statistics are available and because they reflect the asset categories most readily available to individual investors. The exclusion of investment assets such as precious metals, hedge funds, futures, options and managed commodity pools is not meant to imply that these investment categories may not be highly appropriate for a particular client. The approach taken here is conceptual in nature and is only meant to provide an overall framework for asset allocation. Substitutions for some of the recommended asset categories may be highly

## EXHIBIT 3

## Global Portfolio Allocation Scoring System (PASS) for Individual Investors

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Earning a high long-term total return that will allow my capital to grow faster than the inflation rate is one of my most important investment objectives.	5	4	3	2	1
2. I would like an investment that provides me with an opportunity to defer taxation of capital gains to future years.	5	4	3	2	1
3. I do not require a high level of current income from my investments.	5	4	3	2	1
4. I am willing to tolerate some sharp down swings in the return on my investments in order to seek a potentially higher return than would normally be expected from more stable investments.	5	4	3	2	1
5. I am willing to risk a short-term loss in return for a potentially higher long-run rate of return.	5	4	3	2	1
6. I am financially able to accept a low level of liquidity in my investment portfolio.	5	4	3	2	1
	<b>Over what period of time do you expect to remain invested in this portfolio?</b>				
	<b>Three years or less</b>		<b>(short-term horizon)</b>		
	<b>Four to seven years</b>		<b>(intermediate-term horizon)</b>		
	<b>More than seven years</b>		<b>(long-term horizon)</b>		

appropriate in consideration of individual client circumstances and investment objectives.

The six generic categories of investments offer differing types of investment risk/return trade-offs and meet different investor needs and objectives. Money market instruments offer a very high degree of safety of principal and immediate liquidity along with a rate of return that is commensurate with inflation. Money market instruments, however, are subject to a high degree of purchasing power risk. Longer-term fixed income investments offer a high degree of current yield, reasonable liquidity and, for investment grade bonds, excellent protection of principal if held to maturity. In addition, long-term bonds offer an effective hedge against deflation because bond prices increase when interest rates decrease during periods of economic adversity. Of course, on the downside, bond prices fall during periods

of rising interest rates, exposing investors to interest-rate risk. Equity investments in U.S. and international stocks offer the best opportunity for long-term capital gains but also are generally the riskiest investments from the perspective of potential for loss and fluctuation in principal values. These investments are the classic hedges against inflation in that they generally increase in value over long periods of time as the economy expands. Total returns fluctuate the most for equities and, based on past experience, equity investors must be prepared for the near certainty that there will be years in which their equity investments will decline in value. In fact, historical data show that although common stocks provide the highest long-run rates of return overall, they lose money about one-third of the time. Equity investors must be financially and psychologically prepared for this event.

Real estate investment trusts (REITs) offer equity-like returns but low correla-

tions with the U.S. stock market. REITs offer participation in a value stock investment that generally offers low correlation with higher-flying growth stocks or stocks in general. REITs may provide an important "anchor to windward" when other classes of stocks are offering poor returns. For calendar years 2000 and 2001, for example, the S&P 500 Index returned a cumulative loss of -21.0 percent while the Wilshire REIT index returned a positive total return of 43.4 percent.

### An Aggressiveness Index

Exhibit 3 presents the Global Portfolio Allocation Scoring System (PASS) risk tolerance questionnaire that we use in our investment management practice for taxable accounts. The PASS questionnaire requires investors to score themselves on a 1-to-5 scale on six risk-and-return objectives.

## EXHIBIT 4

## Risk Tolerance Profiles

	Short-Term Horizon				Intermediate-Term Horizon				Long-Term Horizon			
	RT1 Target	RT2 Target	RT3 Target	RT4 Target	RT1 Target	RT2 Target	RT3 Target	RT4 Target	RT1 Target	RT2 Target	RT3 Target	RT4 Target
<b>PASS Score</b>	6-12	13-18	19-24	25-30	6-12	13-18	19-24	25-30	6-12	13-18	19-24	25-30
<b>Cash and Money Market Funds</b>	40.0%	30.0%	20.0%	10.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	3.0%	2.0%
<b>Treasury Bonds/ Bond Funds</b>	40.0%	30.0%	30.0%	20.0%	60.0%	35.0%	20.0%	10.0%	30.0%	20.0%	12.0%	0.0%
<b>Corporate Bonds/ Bond Funds</b>	20.0%	30.0%	30.0%	40.0%	15.0%	15.0%	15.0%	10.0%	15.0%	10.0%	10.0%	4.0%
<b>Subtotal</b>	100.0%	90.0%	80.0%	70.0%	80.0%	55.0%	40.0%	25.0%	50.0%	35.0%	25.0%	6.0%
<b>International Bond Funds</b>	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	5.0%	0.0%	5.0%	5.0%	4.0%
<b>Subtotal</b>	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	5.0%	0.0%	5.0%	5.0%	4.0%
<b>Index Fund</b>	0.0%	10.0%	10.0%	10.0%	10.0%	15.0%	15.0%	20.0%	20.0%	20.0%	20.0%	25.0%
<b>Large Cap Value Funds/ Stocks</b>	0.0%	0.0%	5.0%	5.0%	5.0%	5.0%	10.0%	10.0%	10.0%	10.0%	5.0%	5.0%
<b>Large Cap Growth Funds/ Stocks</b>	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	5.0%	10.0%	15.0%	10.0%	10.0%	5.0%
<b>Mid/Small Growth Funds/ Stocks</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	0.0%	0.0%	5.0%	10.0%
<b>Mid/Small Value Funds/ Stocks</b>	0.0%	0.0%	0.0%	5.0%	0.0%	5.0%	5.0%	5.0%	0.0%	5.0%	5.0%	10.0%
<b>Subtotal</b>	0.0%	10.0%	15.0%	20.0%	20.0%	30.0%	40.0%	50.0%	45.0%	45.0%	45.0%	55.0%
<b>International Stock Funds</b>	0.0%	0.0%	0.0%	5.0%	0.0%	5.0%	5.0%	10.0%	0.0%	5.0%	10.0%	15.0%
<b>Subtotal</b>	0.0%	0.0%	0.0%	5.0%	0.0%	5.0%	5.0%	10.0%	0.0%	5.0%	10.0%	15.0%
<b>Real Estate Funds</b>	0.0%	0.0%	5.0%	5.0%	0.0%	5.0%	5.0%	10.0%	5.0%	10.0%	15.0%	20.0%
<b>Subtotal</b>	0.0%	0.0%	5.0%	5.0%	0.0%	5.0%	5.0%	10.0%	5.0%	10.0%	15.0%	20.0%
<b>Total</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

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These questions are assigned one to five points for a maximum possible score of 30; the more points scored, the more the portfolio will be oriented toward equity investments. Conversely, a low score would orient the portfolio more toward fixed income investments. The PASS questionnaire is essentially an “aggressiveness index” in that the more aggressive one’s return objectives and the higher one’s risk tolerance, the more points scored on the questionnaire. The results of the questionnaire underscore for investors and their

advisors that, to earn higher returns, investors must accept higher risks.

All of the questions are structured such that a response of “strongly agree” scores five points and “strongly disagree” scores one point. A “neutral” response scores three points. The first three questions measure return objectives. The second three questions deal with different aspects of risk tolerance: fluctuation in returns, probability of losses and liquidity risk. The last question is unnumbered and unscored. This question asks the client what his or

her expected time horizon is for this portfolio. If a client has more than one portfolio under management, we normally have the client complete one questionnaire for each portfolio if the objectives and time horizon for the portfolios are not identical.

When our clients complete the PASS questionnaire, they simply circle the appropriate response and then add up the score. The risk tolerance profiles in Exhibit 4 then provide us with an approximate guide to what might be an appropriate asset allocation given the client’s return objectives,

risk tolerance and time horizon. The final asset allocation decision for the client is based on the results of the PASS score and all other information we know about the client that we gather in the interview process. We normally spend at least two hours meeting face to face with a new client to be sure they understand our approach to investment management and that we understand their financial situation, goals and risk tolerance. After meeting with the client, the final asset allocation may correspond to one of our risk tolerance profiles in Exhibit 4, or we may develop a customized asset allocation guideline to reflect the particular needs of the client. For example, some clients may already have extensive real estate investments and we would not include REITs in their portfolio. In other cases, a client may already have non-U.S. stock investments outside of our control and we would not include international stock funds in that client's portfolio. In all cases, we consider the impact of assets held outside of our control on the final asset allocation that best fits the needs and circumstances of the client.

The risk tolerance profiles correspond to the PASS questionnaire results and show the client that one way to mitigate risk is to diversify across asset categories. Four risk tolerance profiles are listed to correspond to the questionnaire score and the client's time horizon. For example, the recommended allocation for a moderately conservative investor (RT2 profile, PASS score of 13–18) with a short-term time horizon is 90 percent in money market and fixed income securities, and 10 percent in an index fund. The same profile for an investor with a long-term time horizon is 35 percent in U.S. money market and fixed income securities, 5 percent in international bond funds, 45 percent in U.S. equities (20 percent indexed, 10 percent large-cap growth, 10 percent large-cap value, 5 percent small- or mid-cap value), 5 percent in international funds and 10 percent in REIT funds. In all cases, for any given risk tolerance level, the relative

aggressiveness of the portfolio increases as the time horizon increases.

### Modified Risk Profiles

The risk tolerance profiles can be modified to meet the needs or requirements of individual clients and their advisors. In our practice, we have two sets of allocation guidelines, one set for taxable accounts and one set for qualified plans. Qualified plans in the accumulation phase generally have a lower allotment to money market funds, while qualified plans in the distribution phase generally have approximately one year's worth of distributions allocated to money market instruments. For use within our practice, we also use seven risk tolerance profiles rather than the four shown in the illustration. We also may modify the corporate/Treasury mix depending on the client's tax status, income needs and risk tolerance. Finally, we often find that individual client circumstances require that we devise an asset allocation that does not correspond exactly to any of our preassigned profiles.

The risk tolerance questionnaire developed here for asset allocation provides a unique approach to dealing with the most difficult issue in asset allocation planning—accounting for an investor's expected time horizon for investing. As noted earlier, a simple numerical goals-and-attitude scoring system cannot provide a definitive answer to all of the important issues that need to be addressed before a final asset allocation is established. But it is a useful instrument for making a first pass at an optimal solution and can be a valuable supplement to an asset allocation approach using standard optimization modeling or Monte Carlo simulations. At a minimum, the questionnaire approach provides a useful starting point for a discussion of the implications of a client's risk tolerance for his or her asset allocation choices.



### Endnotes

1. A literature review shows that the first published risk tolerance questionnaire appeared in William G. Droms, *The Dow Jones-Irwin Mutual Fund Yearbook 1984* (Homewood, Ill.: Dow Jones-Irwin, 1984).
2. James H. Wilson and William G. Droms, "Don't Put All Your Eggs in One Basket," *Journal of Accountancy*, January 1999. The Wilson/Droms questionnaire for retirement planning explicitly separates the time horizon question and assigns points to an investor's final score based on years to expected retirement.
3. The idea of separating time horizon from the "scoring" questions originated from a working group of which the author was a member at Foliofn<sup>®</sup> in Vienna, Virginia. An interactive version of this approach with different questions and different recommendations is available at Foliofn.com.