

# RBC Model Portfolios/ RBC Expanded Model Portfolios

## *Risk Profile Methodology*

Different investors have different risk profiles. Much of the difference stems from time horizon. That is, someone with a short investment time horizon is less able to withstand losses. The remainder of the difference is attributable to the individual's appetite for risk. Volatility can be nerve-wracking for many people and they are more comfortable when they can avoid it. However, there is a definite relationship between risk and return. Investors need to recognize this risk/return trade-off. The risk profile questionnaire has been designed to measure an individual's ability (time horizon) and willingness (risk tolerance) to accept uncertainties in their investment's performance. The total score determines which of the five risk profiles is most appropriate for the investor.

### **QUESTIONNAIRE SCORING SYSTEM**

RBC Capital Markets, LLC, (RBC CM) works with Ibbotson Associates to develop the Risk Profile Questionnaire. Ibbotson Associates is an objective, credible source and a leading authority on asset allocation.

Ibbotson designed the questionnaire scoring system to assign individuals to an asset allocation model based on their responses from the risk tolerance questionnaire.

Like the questionnaire itself, the scoring system is divided into two distinct sections:

- Time horizon score
- Risk tolerance score

Each section is scored separately, and then combined to form a total score. Ibbotson uses the total score to

propose an asset allocation model recommendation. The sections below discuss this process.

### **Time Horizon Score**

The time horizon portion of the scoring is taken from questions 1 and 2. The score on these two questions determines the time horizon level. The time horizon level is used to assign various time horizon factors.

Each time horizon level gives the investor access to certain asset allocation models and restricts access to others. Investors that score into the shorter time horizon levels are not given access to the more aggressive asset allocation models. This is consistent with Ibbotson's belief that individuals with shorter-term horizons should hold portfolios that are more conservative.

Within each time horizon level, Ibbotson allows an investor's risk tolerance to determine the appropriate asset allocation model. If an investor's risk tolerance suggests a portfolio that is restricted (due to the time horizon level), Ibbotson recommends a more appropriate asset allocation model for that investor's specific time horizon level. This process allows conservative investors with short time horizons to score into an asset allocation model matched to their risk tolerance while at the same time protecting aggressive investors with short time horizons from excess risks.

### **Risk Tolerance Score**

The risk aversion portion of the scoring is taken from questions 3 through 7. The score on these questions determines the risk tolerance level. Where the primary purpose of the time horizon score is to find the investor's ability to take on risk, the main goal of the risk tolerance portion of the questionnaire is to capture how much risk the investor is willing to take.



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## *RBC Model Portfolios / RBC Expanded Model Portfolios, continued*

The risk tolerance level is comprised of many different concepts uncovered by behavioral economists in recent decades, including loss aversion, risk-reward tradeoff, inflation risk, and the ability to stay the course. An investor who feels uncomfortable with extreme volatility or the possibility of large losses to their portfolio is placed in a more conservative option, while an investor who is willing to accept greater risk is placed in a more aggressive option.

### **ASSET CLASS**

Asset classes are defined as categories of investments with common characteristics. Some of these characteristics may include the following: nature of the financial claim (debt, equity); security issuer (foreign/domestic, government, corporate); term length of debt (short, intermediate, long); and other factors such as liquidity or risk.

Asset classes are typically defined so that no one security can be classified into more than one category. Securities within well-defined asset classes should react similarly to changes in economic circumstances. Ibbotson chooses benchmarks to represent each asset class such that no one security can be classified into more than one benchmark category. The benchmarks trade in established markets that provide price information and price histories.

### **EXPECTED RETURN**

RBC CM leverages its extensive internal resources and capabilities to develop capital market assumptions. The approach blends quantitative and qualitative analysis to forecast the expected returns, expected risk, and correlations for each asset class.

### **Quantitative**

- RBC CM applies a quantitative model known as the Black Litterman method to derive the implied return assumptions based on the market values of all available assets.

### **Qualitative**

- Structural shifts within asset classes are identified to determine the most representative performance records in order to more accurately forecast future periods.
- Historical risk premiums between asset classes are analyzed to account for changing trends.
- All assumptions and forecasted results are verified to ensure results are intuitive, realistic, and implementable.

### **EXPECTED RISK (VOLATILITY)**

RBC CM uses historical data to forecast the expected return volatility (risk) in each asset class. Volatility trends and relevant performance records are also carefully analyzed to achieve the most representative forecasts.

### **CORRELATION COEFFICIENT**

Correlation figures estimate the extent to which the returns of two asset classes move in the same direction. Again using historical data, RBC CM determines the degree to which asset classes have tended to move in the same direction over time. Correlation coefficients can range from perfect positive correlation (+1) to perfect negative correlation (-1). Perfect positive correlation implies the returns always move in the same direction while perfect negative correlation implies the returns always move in opposite directions. A correlation coefficient of zero would imply that the returns are unrelated. Combining asset classes with low correlations has been shown to reduce risk (volatility) over time.

## *RBC Model Portfolios / RBC Expanded Model Portfolios, continued*

### **STRATEGIC ASSET ALLOCATION MODELS**

Strategic asset allocation is the process of setting long-term allocations to asset classes based on the various return and risk profiles. After forecasting the expected returns, expected volatility, and correlations, the figures are input into a traditional mean-variance optimizer to help determine target allocations across the risk/return spectrum. The process yields an optimal combination of asset classes that maximizes return for each given level of risk.

### **EFFICIENT FRONTIER**

The efficient frontier line identifies the possible model allocations that maximize expected return for each level of risk (or minimize risk for a given return). The efficient frontier's construction is based on the asset classes used and the capital market assumptions for those asset classes.

Using mean-variance optimization, asset allocation models are formed using combination of the asset classes. These models are plotted and a line traced which connects all of the efficient portfolios. This line forms the efficient frontier. Asset mixes below the frontier are inefficient — return could be higher without taking on more risk or the risk could be lower while helping preserve the same return.

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