

# Using asset class diversification to improve investment returns



by John Ambrose, CFA

Each individual has the challenge of accumulating enough assets at the time of retirement, and then investing them to provide adequate long-term income with a tolerable risk. Current retirees must also contend with low interest rates and increasing life expectancies.

Every investor must deal with the following questions when constructing a portfolio:

“What are the various types of investments available and how much risk is attached to each?”  
“How much risk can be tolerated?”  
“How much return is required in order to afford retirement?”  
“How can diversification improve expected return for a given risk tolerance?”

Although investment returns are uncertain, investors have some control over their cost of living, and can control the asset mix of cash, bonds, and equities in their retirement portfolios.

## The nature of major asset classes

Each asset class has a different investment purpose. Portfolio return is the sum of interest, dividends, and capital gains. The risk attached to a particular portfolio is the variation expressed as the standard deviation of returns of each asset class (the standard deviation is a statistical measure of the amount of variance of the return from the average at any one time).

Money market investments are the most secure, which means that the

capital investment and interest paid are guaranteed. This investment is also “liquid,” which means the investment can be converted to cash quickly for another investment or purchase. Low interest income of two per cent to three per cent is the tradeoff for this flexibility.

Bonds pay guaranteed interest at regular intervals and repay principal at maturity with generally a moderate to high degree of security. Bonds provide income and reduce volatility from market activity compared to equities.

Investors can select bonds based on income, credit quality, and maturity date, for example. Bonds may or may not be able to be sold prior to maturity and thus may not be liquid.

Their value on the open market will be determined by the level of interest rates at the time of the sale, and there may be a loss or gain over the purchase price at this point.

Equities or common stocks are a broad class of investments that may pay dividends and offer the potential of capital gains from corporate growth. These are riskier investments than bonds because investors share directly in the “residual” earnings of the

companies, but only after bondholders’ interest and principal are repaid. Higher risk is rewarded with the potential for higher returns.

Publicly traded shares may be very liquid and easily sold. Private shares may be very difficult or almost impossible to sell.

It is interesting to compare the returns on these various types of investments. Over the last 74 years, equities returned about nine per cent annually versus bonds at six per cent, and cash at four per cent. However, the risk, as measured by the standard deviation of return per year, was highest for equities at 16 per cent, versus bonds at nine per cent, and cash at two per cent.

What will happen in the future is unknown, and many experts have different expectations going forward from these historical observations.

Part of diversification is blending these characteristics to suit the investor’s tolerance for risk. Part of the benefit is the fact that the various asset classes do not always move in the same direction at the same time.

<b>The Benefit of Diversifying a \$2.5 Million Portfolio</b>					
Bond/Equity mix %	100/0	75/25	50/50	25/75	0/100
Expected annual after-tax return	\$ 89,000	\$ 97,000	\$106,000	\$115,000	\$123,000
Expected annual risk	\$230,000	\$212,000	\$244,000	\$312,000	\$400,000

**How the diversification theory works**

In 1952, Harry Markowitz developed his theory on portfolio diversification. Later, Bill Sharpe added work on the optimization of return and risk.

The two men shared the Nobel prize for Economics in 1990. Their work illustrates how diversification can reduce risk to acceptable levels, and increase returns over the long term.

These two men discovered that if a portfolio was diversified by asset class, then the overall return from the portfolio could be improved for a given risk tolerance. Diversification lowers the risk attached to a portfolio due to the fact that returns of the various asset classes are not totally correlated.

The importance of this discovery was far from just academic. A portfolio of securities has an expected return that is a proportional blend of the expected returns of the individual securities. Risk is the possibility of unexpected changes in return as measured by standard deviation. Risk is not a proportional blend, but rather is beneficially lower by different amounts based on asset mix, and the asset correlation.

The following model will illustrate how this works. The asset classes are equities (New York Stock Exchange index), U.S. bond total returns, and cash exemplified by U.S. treasury bills over the period 1929 to 2003.

Other assumptions of expected returns and risks will lead to the same general conclusions.

**Reduced risk from asset mixing**

When a portfolio contains one asset class, the risk of the portfolio is the risk of the asset class. Obviously, if an investor owns all bonds, then the portfolio's risk is the risk associated with bonds. However, when different asset classes are blended, the portfolio's risk is reduced because different asset classes do not generally move in the same directions at the same times. The portfolio risk becomes more influenced by the "co-variance" of the asset classes.

In the following example, which illustrates a 50%/50% bond/equity mix, only 50 per cent of the portfolio's risk comes from the risk of bonds and equity independently. The remaining component of the portfolio's risk comes from the covariance of bonds and equity that is only 10 per cent as risky as the variance of the equity and bonds together. Therefore, the entire risk of the portfolio falls with a blend of bonds and equity.

**Example of risk tolerance**

An individual approaching retirement has \$2.5 million in invested assets. Annual expenses amount to \$100,000, but after-tax income amounts to \$50,000 based on a cash-only portfolio with an interest rate of 2.5 per cent and a tax rate of 25 per cent. So there is a \$50,000 shortfall.

The investor has felt that trying for higher returns involves too much risk. How could the investment portfolio and risk tolerance be adjusted to provide the required retirement income?

The individual is healthy, with a 25-year life expectancy, and can tolerate moderate market risk. Risk means the possibility of price changes, and is a natural, but uncomfortable, part of investing for long-term growth. The investor has expressed a tolerance for risk at about 10 per cent, or \$250,000 in any year.

Adding bonds to the portfolio can help dampen this volatility. There is the added benefit of diversification with a blend of cash, bonds, and equity. The expected annual risks are \$50,000 for an all cash portfolio, \$230,000 for all bonds, and \$400,000 for all equity. Up to now, the investor has thought that the only way to control risk is by investing in cash. However, using a blend of partially uncorrelated investments can reduce the portfolio risk while producing an adequate retirement income.

**Implications of diversification**

The model forecasts the expected after-tax return in dollars, and the maximum expected variability in dollars for the individual's \$2.5 million portfolio with an average tax rate of 40 per cent. Results are presented in the table opposite.

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This table allows an objective discussion about the trade-off between higher returns required for retirement, and the accompanying variability in returns with a higher proportion of equities.

With no equities and all bonds, the expected after-tax return is \$89,000, and therefore does not cover the annual expenses of \$100,000. The expected annual risk is \$230,000, and is within the client's risk tolerance.

By increasing the mix of equities to 50 per cent of the portfolio, with the balance in bonds, the expected return rises to \$106,000, and therefore marginally exceeds the client's annual expenses.

The expected risk only rises to \$244,000 with diversification — only slightly higher than the portfolio with all bonds.

Extending the example, the investor can consider increasing the equity mix further to 75 per cent.

The expected return rises to \$115,000. However, the expected annual risk rises to an intolerable \$312,000. Therefore, the investor would decline this asset mix choice, or review the risk tolerance.

As the table shows, an investor client must hold more equity for more return. This can mean lower risk for small mixes of equity. Portfolios that blend bonds and selected equities will provide the right balance of return and risk to meet an investor's needs.

It should be noted in the preceding example that the investor concerned has managed to accumulate the necessary capital to make the desired income level a reality.

Often, there are not enough assets to work with at any risk level to provide the necessary income. In this case, the investor may need to adjust his or her desired lifestyle to fit with the potential income generated with the acceptable risk level.

While the benefits of diversification might not be realized in a particular year, the long-term value of this approach is most important. Many investment advisers feel that the choice of asset classes is more important than the individual investment selection for long-term successful investing.

It may be prudent to enlist the services of a knowledgeable investment adviser in assessing the acceptable risk level, and constructing an appropriate portfolio. **OMR**

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*John Ambrose is President of Ambrose Investment Counsel Ltd. in Toronto.*

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**Doctor's Business is a monthly feature provided by Richard White, FSA, FCIA, CFP, retirement, estate and employee benefits consultant.**