

# MARKET MONITOR

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### EXTENDING DIVERSIFICATION

Despite the stock market meltdown of 2008–2009, diversification remains a widely held fundamental investment principle, i.e., the idea that you can benefit by not putting all your investment eggs in one asset-class basket. In fact, there are really two reasons for broad asset class diversification: (1) no one can predict asset class turning points with invariable accuracy, so diversification helps an investor avoid the risks of market timing, and (2) modern portfolio theory tells us that a properly diversified portfolio can provide a better expected return per unit of risk than any of the single assets contained in that portfolio can.

- In light of recent market events, does broad asset class diversification still work?
- What, if any, are the potential benefits of diversifying at the asset subclass level and how do they compare with more concentrated portfolios?



An investor who moved all of her assets into a guaranteed fund or into bonds at the beginning of 2008 would have avoided overall stock market losses of well over 50% by the end of February 2009. Does that breathtaking number suggest that diversification is dead? Wouldn't it have been better to avoid stocks and hide out in the safety of cash and fixed income?

This year, the same investor who got out of stocks would have missed a big opportunity, unless she was able to transfer assets back into equities at the beginning of March 2009. From then until the middle of May, equities returned a total of over 30%, while cash and fixed income returned less than a quarter of a percent.

So if our investor can time the market, her savings will grow fastest by putting it all in the asset class with the highest return. For example, over the last 80 years (1929–2008), U.S. equities returned about 9.2% per year, well ahead

of 10-year U.S. Treasury bonds (5.3%) and 3-month U.S. Treasury bills (3.3%).<sup>1</sup> So \$10,000 invested in U.S. stocks in 1928 would have been worth over \$1 million at the end of 2008, compared to about \$600,000 for bonds and about \$200,000 for T-bills (often referred to as “cash”). So the apparent advantage of sticking with the highest-returning asset class, in this case stocks, goes without question.

Or does it? Table 1 follows two asset classes and various ways of investing \$10,000 over a five-year period. All returns are hypothetical. In the first year, equities suffer from a market meltdown and lose 50%. U.S. T-bills, on the other hand, return 5% as investors flock to the safety of government securities. In the second year, equities benefit from a significant market rebound, while T-bill returns diminish as investors begin to sell in order to buy back into riskier assets. In years three through five, both equities and T-bills provide returns equal to their long-term averages.

**Table 1**  
**SHOULD YOU DIVERSIFY?**

	ANNUAL RETURN					5-YEAR RETURN
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	
Equities	-50%	34%	9%	9%	9%	
T-bills	5%	0%	3%	3%	3%	

PORTFOLIO VALUE	START						
1. All Equities	\$10,000	\$5,000	\$6,700	\$7,303	\$7,960	\$8,677	-13%
2. All T-bills	\$10,000	\$10,500	\$10,500	\$10,815	\$11,139	\$11,474	15%
3. 60/40							
Rebalance	\$10,000	\$7,200	\$8,669	\$9,241	\$9,851	\$10,501	5%
Do Nothing	\$10,000	\$7,200	\$8,220	\$8,742	\$9,323	\$9,603	-4%
Go to Treasuries	\$10,000	\$7,200	\$7,200	\$7,416	\$7,638	\$7,868	-21%

Source: Author's calculations.

The data presented is for illustrative purposes only and is neither a recommendation nor an indicator of future results.

<sup>1</sup> Author's calculations based on Federal Reserve Board asset class annual time series, 1928–2008.

After five years, an investor who placed \$10,000 entirely in equities would have about \$8,700, a loss of 13%. In contrast, the smart—or lucky—investor who put the entire amount in T-bills would have almost \$11,500, a gain of 15%. As we know, over the long run equity returns have far exceeded those of T-bills, but the example in the table shows T-bills outperforming.

After the fact, we can always pick the highest-returning asset class. In the real world, however, investing involves future returns, an inherently risky proposition. As we know, with return comes risk, and investment risk can have several meanings. Risk could refer to failing to reach your savings and investment goal. There is also the risk of having a rough ride along the way to the goal. Risk could also be the probability of being underwater (having less money than you started with) at some point, whether the investment time horizon is short-, medium-, or long-term.

**Table 2**

**FIXED-INCOME SUBCLASS RETURNS AND STANDARD DEVIATIONS**

	LONG-TERM ANNUAL PERF <sup>2</sup>		RETURN	
	RETURN	STD DEV.	2008	1Q 2009
Money Market	2.82	2.95	2.55	0.22
Intermediate Bond	4.85	6.82	5.24	0.12
Inflation-Linked Bond	4.09	11.39	-2.35	5.52
High-Yield	6.65	12.24	-23.23	6.49
Tax-Exempt Muni	3.86	6.51	1.52	3.41

**CORRELATIONS AMONG FIXED-INCOME SUBCLASSES<sup>3</sup>**

	MONEY MARKET	INTERMEDIATE BOND	INFLATION-LINKED BOND	HIGH-YIELD BOND
Money Market				
Intermediate Bond	0.19			
Inflation-Linked Bond	0.05	0.84		
High-Yield Bond	0.02	0.29	0.32	
Tax-Exempt Muni	0.11	0.80	0.67	0.28

The data presented is for illustrative purposes only and is neither a recommendation nor an indicator of future results.

<sup>2</sup> Long-term expected performance figures from Ibbotson Associates.

<sup>3</sup> Correlations are author's calculations based on 1988-2008 index returns.

In the accompanying graph, risk is defined as the expected long-term annualized volatility of returns (standard deviation). For equities, volatility is 17%, and for T-bills it is 3% (recall that expected returns are 9% and 3%, respectively).

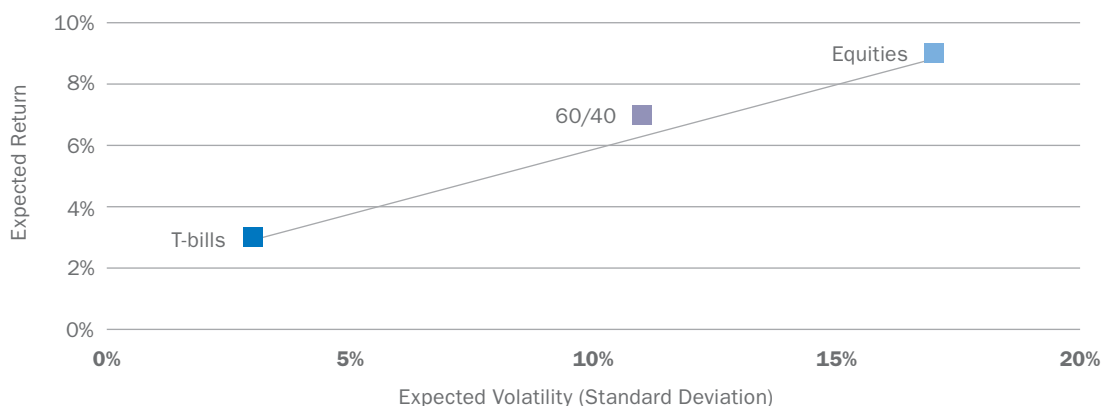
The Sharpe ratio measures the amount of reward an investor can expect to receive per unit of risk. It is calculated by dividing the expected return in excess of the T-bill return by the expected standard deviation of that return. The Sharpe ratio for equities would then be 0.35 and for T-bills would be zero.

However, a portfolio consisting of 60% equities and 40% T-bills would have a slightly better Sharpe ratio of 0.37. The chart shows this in graphic form. The 60/40 portfolio point lies above and to the left of a line connecting T-bills

and equities, showing that this portfolio would be expected to provide a risk-adjusted return superior to either of its two components. Adding additional asset classes, such as bonds, real estate, and a guaranteed fund, would increase the Sharpe ratio even further.

Returning to Table 1, we can see that, in this hypothetical example, a 60/40 portfolio's five-year return would lie between the returns of the all-equity and all-T-bill portfolios. This would be true whether or not the portfolio was rebalanced each year back to the 60/40 mix. An even worse outcome would be experienced by a market-timing investor who initially chose a 60/40 portfolio, experienced the first-year equity market meltdown, and then moved entirely to T-bills for the next four years.

## DIVERSIFICATION



In more formal terms, the foundation for investment diversification was laid by Nobel Prize-winning research by Harry Markowitz in the 1950s. Since then, his insights have blossomed into both a vast academic enterprise and practical advice for individuals and institutions who wish to find the best expected return that can be had for the amount of expected risk they can tolerate. The concepts and methods of diversification are reflected in TIAA-CREF's advice offering, which enables any participant to develop a diversified portfolio that can help meet his or her investment objectives.

So far, we have been looking at the broadest asset classes. What are the benefits of diversifying *within* a single broad asset class, such as fixed income? Are those benefits

similar to the reasons for diversifying at the broad asset-class level? Table 2 displays expected returns and standard deviations for five fixed-income asset subclasses: money market, intermediate bond, inflation-linked bond, high-yield bond, and tax-exempt municipal bond, as well as actual returns for indexes representing each of those subclasses for 2008 and the first quarter of 2009.

These fixed-income returns range from almost 3% to 6.5% per year and their volatilities range from about 3% to over 12% per year. Note especially the recent index performance. In 2008, intermediate bonds rose over 5%, while inflation-linked and high-yield bonds turned in negative performance and municipal bonds rose, but less than their long-term expected return. In the first quarter of 2009, however,

relative returns among these subclasses reversed. The three relative underperformers—inflation-linked, municipal, and high-yield bonds—handily outperformed intermediate and money market indexes.

The explanation is that in 2008, investors craved the safety and liquidity of U.S. Treasury bills and bonds, so they bid up the prices and the returns of intermediate bonds, which contain a high percentage of these securities. In contrast, they avoided corporate and municipal bonds out of mistrust for the health of the private sector, the states and local governments. They also shunned U.S. Treasury inflation-protected securities (TIPS) because of fears of deflation, which would hurt TIPS returns in contrast to ordinary Treasury securities.

In the first quarter of 2009, investors realized that municipal and corporate bonds were not as risky as they had thought and began to reallocate their money from U.S. Treasuries back toward these securities. Their interest in inflation-linked bonds also reawakened as some grew concerned about the effect of monetary and fiscal stimulus on the future rate of inflation.

Like the broad asset classes, fixed-income subclasses do not behave the same way at a given time. In more formal terms, correlations among these fixed-income asset classes are relatively low. Table 2 also shows the fixed-income asset subclass correlations. Only two of the ten correlations are over 0.6. (A correlation of 1.0 between two

asset classes implies that their returns move in lock step; -1.0 indicates that their returns move the opposite way; and near zero suggests that returns have little to no relation to each other). The other eight correlations are less than a third (0.33), showing that their returns go up and down at different times.

In other words, although these asset subclasses are all classified as fixed income, they don't generally behave the same way and, thus, are excellent diversifiers. Using more than one of these subclasses can improve the risk-return characteristics of a portfolio.

Of course, we should keep in mind that correlations aren't always stable. There are times, especially during extreme market movements, when correlations trend upward. The benefits of diversification can then be temporarily diminished.

Nevertheless, over the long run, diversification is a sound fundamental principle of investing and one that has significant practical implications for improving portfolio performance. As we have seen, when markets are especially volatile, it may be especially tempting to find the best-performing asset class and avoid the rest. Instead, investors can rest assured that solid theory and practical experience favor diversification over a much riskier single-asset strategy. The same holds true for asset subclasses as well as broad asset classes.

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