# THE LONG TERM RISKS OF VOLATILITY

THE PROBLEM:

A portfolio of individual stocks is far more volatile than the overall market.

WHAT IT MEANS FOR YOU:

Higher volatility leads to lower compounded returns over the long term. Therefore investors who hold individual stocks are taking risk that is unlikely to be rewarded.

THE SOLUTION:

Investors can reduce risk and enjoy higher compounded returns by holding fully diversified portfolios with thousands of stocks.

All investors understand that there is no reward without risk. But not all risks offer the promise of higher returns. When Green Bay Packers quarterback Aaron Rodgers takes the field, he accepts that playing in the NFL carries the risk of injury, but the $10.4 million he received in 2011 was ample compensation. If Rodgers were to play without a helmet, he would certainly increase his risk. But his performance would not improve, and he would receive no additional pay. Playing football without a helmet is taking risk without reward.

This same principle applies to investing in individual stocks. Market risk cannot be diversified away even if you hold thousands of stocks—and that's a good thing, since this risk premium is why stocks have higher expected returns over cash and bonds. Holding individual companies, however, adds volatility without raising expected long-term returns. Investors who concentrate their portfolios in a small number of stocks, therefore, are like a bareheaded quarterback.

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The benefit of low volatility is not simply that it makes jittery investors more comfortable. The important point is that lowering volatility allows portfolios to compound at a faster rate, leading to higher returns over the long term.

To understand this point, let's consider a simple example. Suppose a couple is retiring at age 65 with $1 million. Their primary goal is to receive $40,000 per year (with annual inflation adjustments) to meet their lifestyle needs, and their secondary goal is to leave an estate to their heirs.

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Table 1 shows two scenarios: the first is a diversified portfolio with low volatility, while the second is a concentrated portfolio with higher volatility. In both cases, we assume a 6% average rate of return and 2% inflation.

TABLE 1: EFFECT OF VOLATILITY ON INCOME AND WEALTH

| SCENARIO | AVERAGE RETURN | PROBABLITY OF MEETING INCOME GOALS | ESTIMATED ESTATE VALUE AT AGE 90 |
|---|---|---|---|
| LOW VOLATILITY (DIVERSIFIED PORTFOLIO) | 6% | 93% | $770,000 |
| HIGH VOLATILITY (CONCENTRATED PORTFOLIO) | 6% | 64% | $300,000 |

*Note: Results based on Monte Carlo simulation using a normal distribution and 20,000 trials over 25 years. Diversified portfolio assumes a 10% annual standard deviation and concentrated portfolio assumes a 20% annual standard deviation.*

*High volatility has a corrosive effect on your money's ability to compound*

As Table 1 shows, high volatility has a corrosive effect on your money's ability to compound. The high-volatility portfolio fails to meet the couple's income goals about one-third of time. Second, the estimated estate value at age 90 (on average) is more than two and half times greater with the diversified portfolio than the concentrated portfolio. Remember, in both cases all other assumptions were the same, including the average return: the only difference was the yearly volatility.

David Booth, chairman and co-founder of Dimensional Fund Advisors, has performed an even more robust analysis of how this simple math can affect a portfolio over the long term. Using data from 1926 to 2009, Booth ran one million simulations to compare the results of a diversified portfolio with those of a concentrated portfolio with the same average monthly return, but twice the volatility. His data give us the range of possible outcomes over a 25-year period:

*The concentrated portfolio not only lagged 19 times out of 20, but it had a 30% probability of ending the period with negative returns*

TABLE 2: COMPOUND RETURNS AND GROWTH OF WEALTH OVER 25 YEARS
*(one million simulations)*

| | ANNUALIZED RETURN | |
|---|---|---|
| PERCENTILE | DIVERSIFIED | CONCENTRATED |
| 95 | 16.3% | 17.4% |
| 90 | 14.8% | 14.3% |
| 70 | 11.6% | 7.8% |
| 50 | 9.4% | 3.5% |
| 30 | 7.2% | -0.7% |
| 10 | 4.2% | -6.6% |
| 5 | 2.7% | -9.3% |

*Source: David G. Booth, "A New Look at Diversification," Dimensional Fund Advisors, 2009.*

The 50th percentile is the median: in other words, half of the simulations would have produced a better result than this figure, and half a worse result. In Booth's sample, summarized in the above table, the median annualized return of the diversified portfolio was 9.4%, compared with just 3.5% for the concentrated portfolio.

Over 25 years, the diversified portfolio in Booth's analysis outperformed a concentrated one about 95% of the time, simply because of its lower volatility. The concentrated portfolio not only lagged 19 times out of 20, but it had a 30% probability of ending the period with negative returns (indicated by the blue numbers).

> *The best way to put the odds of success in your favour is to own a globally diversified portfolio of thousands of stocks*

To reach your investment goals, therefore, the best way to put the odds of success in your favour is to own a globally diversified portfolio of thousands of stocks. This strategy allows you to capture all that the equity markets have to offer while keeping volatility to a minimum so your wealth will compound as quickly as possible.

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This paper was co-written by the members of the Final Frontier Group (FFG). Founded in 2006, the FFG is an independent study group comprised of six successful portfolio managers and financial advisors affiliated with various firms across Canada. The mandate of the Final Frontier Group is to facilitate the sharing of unbiased "best practice" ideas and portfolio research.

The common thread uniting members of the group is a keen interest in the science of investing and the desire to excel at client service. The advisors in the FFG collectively oversee more than $1 billion worth of private client assets.


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