THE RISK OF HOLDING CONCENTRATED STOCK

Equity-based compensation, initial public offerings, and inheritances can result in large concentrated stock positions. Behavioral biases and low cost bases cause many investors to maintain exposure to these holdings. But this decision might benefit from a fuller appreciation of the risk.

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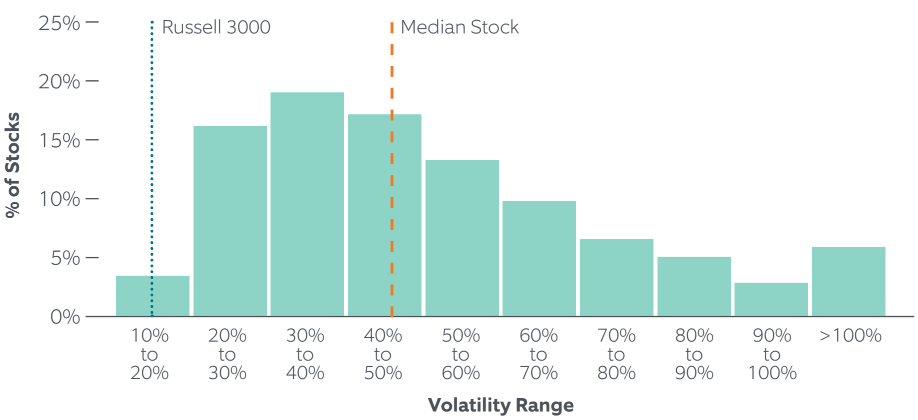
Individual stocks have significant idiosyncratic risk, which is the unique firm-level risk that is not explained by the systematic risk of the overall stock market. Idiosyncratic risk is uncompensated and diversifiable. The owner of a concentrated stock position can diversify away the idiosyncratic risk by selling the stock and reinvesting the proceeds into a well-diversified stock portfolio.

We illustrate the potential risk of owning a single stock versus the Russell 3000 index, a highly diversified stock portfolio. The Russell 3000 index includes the 3,000 largest publicly traded companies in the United States by market capitalization, representing roughly 98% of the U.S. stock market. We look back 20 years to examine the volatility risk (standard deviation) of all stocks that were constituents of the Russell 3000 at any time between January 1999 and December 2018. Exhibit 1 shows the distribution of annualized volatilities for these stocks.[1]

EXHIBIT 1 — INDIVIDUAL STOCK VOLATILITY

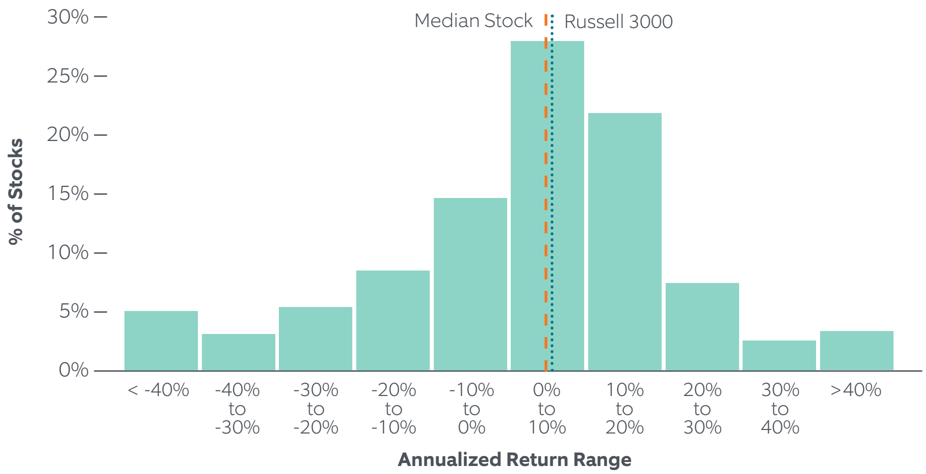


Sources: Northern Trust Research, Morningstar, FactSet.

1 Only stocks with a minimum of 24 months of returns are included to compute the annualized standard deviation. 6,076 stocks were listed in the Russell 3000 over this 20-year period that met the 24-month minimum.

The median stock had a volatility of 46.1%, which was three times riskier than the 14.8% volatility of the Russell 3000. A closer look at the values in the leftmost bar indicates that *only 0.2%* of stocks had less volatility than the Russell 3000. The idiosyncratic risk of individual stocks is very high, and the risk-reduction benefit of owning a broadly diversified stock portfolio instead is significant. Exhibit 2 shows the distribution of annualized returns for these same stocks.

EXHIBIT 2 — INDIVIDUAL STOCK ANNUALIZED RETURN



Sources: Northern Trust Research, Morningstar, FactSet.

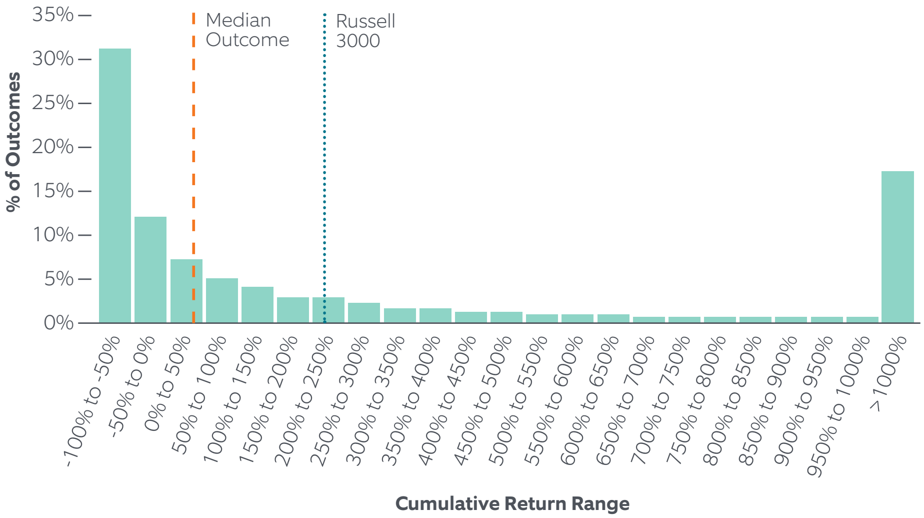
The risk-reduction benefit of owning a broadly diversified stock portfolio is significant.

The 5.96% compound annualized return of the Russell 3000 was 0.73% more than the 5.23% return of the median stock. There is also a large left tail of negative return outcomes for many individual stocks.

Since volatilities tend to be more persistent across different time periods than returns, and since many stocks did not exist for the full 20 years, we turn to Monte Carlo simulation to more precisely estimate the return possibilities of holding concentrated stock over extended holding periods. For each month in the 20-year time period, we randomly sample a monthly return from a stock that was held in the Russell 3000 at that time to create a hypothetical 240-month return series.[2] This approach allows us to capture the return characteristics of individual stocks over the full duration of the 20-year time period. We do this simulation 10,000 times and show the distribution of cumulative return outcomes over 20 years in Exhibit 3.

2 These returns treat dividends as reinvested to match the dividend treatment of the Russell 3000 TR Index.

EXHIBIT 3 — INDIVIDUAL STOCK CUMULATIVE RETURN OUTCOMES



Sources: Northern Trust Research, Morningstar, FactSet.

Two-thirds of the simulations underperform the cumulative 218.39% return of the Russell 3000 Index (5.96% annualized). The cumulative return of the median outcome is only 44.39% (1.85% annualized). The far left and far right sides of the histogram show the extreme positive and negative return possibilities. In nearly one-third of our simulations, the individual stock experienced a catastrophic loss of worse than -50%. Exhibits 2 and especially 3 highlight that firm-level idiosyncratic risk is uncompensated on average, and catastrophic return outcomes are not uncommon.

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As previously noted, single-stock concentrations typically come with low cost bases that deter investors from selling the stock and realizing capital gains taxes. To incorporate capital gains tax into our evaluation we look at two scenarios:

1. **Hold Stock:** Hold the individual stock without realizing capital gains and assume a charitable gift or inheritance with step up in basis at the end of the 20-year holding period.
2. **Sell & Diversify:** Sell the stock today, pay the capital gain tax, and invest the net proceeds in the Russell 3000 for the 20-year period.[3]

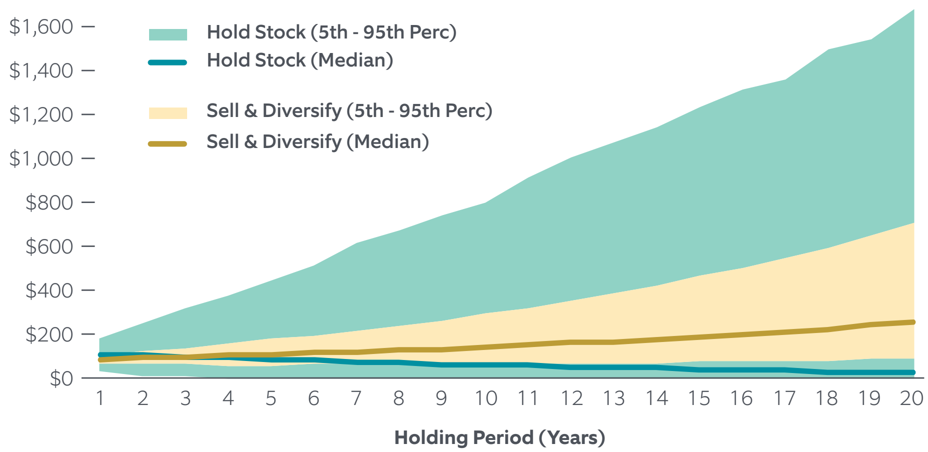
We assume the individual stock and Russell 3000 have the same average annual return of 6.92% and standard deviations of 46.1% and 14.8%, respectively, which we take from Exhibit 1.[4] We run 10,000 simulations of 20-year holding periods with a starting value of $100 and show the 5th, 50th and 95th percentile outcomes of these simulations in Exhibit 4.[5]

3 For simplicity and to facilitate a direct comparison, we assume $0 cost basis, a 20% long-term capital gains tax rate, and no interim dividends for either the single stock or the Russell 3000.

4 The annual arithmetic mean return of the Russell 3000 Index for the 20-year period is 6.92%. This is representative of the individual stock as well since the weighted average of the arithmetic mean returns of constituent stocks should equal the arithmetic mean return of the Russell 3000.

5 The simulations employ a normal distribution.

EXHIBIT 4 — HOLD STOCK vs SELL AND DIVERSIFY



Sources: Northern Trust Research, Morningstar, FactSet.

Investors underestimate the idiosyncratic risk of individual stocks and overvalue the benefit of avoiding the capital gains tax.

The median outcome for the Sell & Diversify scenario increases in value over time, while the median Hold Stock scenario deteriorates. This demonstrates the drag of high volatility risk on compounded, multi-year returns. The median outcome of the Sell & Diversify scenario is greater than the median outcome of the Hold Stock scenario by the end of year 4. This suggests that it can be sensible to hold a concentrated stock when an imminent gift is planned, but less prudent for gifts planned in the more distant future. The spread of outcomes over time is also informative. The lower 5th percentile of outcomes shows values going to zero at four or five years out. In contrast, the Sell & Diversify scenario eliminates the risk of going to zero.

The overall results suggest investors may underestimate the idiosyncratic risk of individual stocks and overvalue the benefit of avoiding the capital gains tax. In the vast majority of circumstances, reducing a concentrated stock position and reinvesting the net-of-tax proceeds in a well-diversified portfolio is prudent to remove the uncompensated, idiosyncratic risk that can undermine the funding of lifetime goals.