

Outside the Flags

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Taming the Luck of the Draw

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Buying a lottery ticket gives gamblers a chance to make an absolute bundle for a small outlay. But the odds are overwhelmingly against them. It's this death-or-glory mentality that many people bring to investing.

Say there's a lottery on sale – with two million tickets issued at \$1 each. The grand prize in the draw is \$1 million, second prize is \$500,000. Plus, there are two third prizes of \$100,000 each, 10 consolation prizes of \$20,000 each and 10 of \$10,000 each.

We're assuming this lottery is run on a costless basis, so that all the money that comes in is paid out. Now the *mean*, or average, payoff from that \$1 bet is \$1. That's the total prize pool of \$2 million divided by the two million tickets on issue. But we know that, in reality, all but 24 ticket holders are going to come away with absolutely nothing.

Because average returns are so affected in this case by "outliers", or extreme outcomes, it makes more sense to use the *median* return. The median is the middle number in the series of outcomes when arranged in ascending order. In our lottery example, the person in the median position, with half the sample above him or her and half below, wins nothing from the gamble.

It's an example worth recalling when investors insist on concentrating their exposure to the equity market in one or two or even a handful of stocks. Investing this way, particularly over the long term, is really just speculation. It's just like buying a lottery ticket.

Here's why: Over time, the distribution of market returns tends to become skewed. The greater the variability of returns in any one year, as we saw in 2008 and 2009 for instance, the more skewed the multi-year outcomes.

Owning one or two, or a handful of stocks, makes long-term investors more exposed to this variability of returns. By contrast, diversifying over many stocks reduces the skewed nature of returns and increases the odds of investors achieving their individual desired outcomes.

It's important to understand that diversification does not improve expected *return*, but it does reduce *risk*. Essentially, while you are sacrificing a very small chance of a huge reward, you are also reducing the chances of a very bad outcome and improving the odds of getting closer to the median outcome.

Here's an example prepared by Dimensional's co-chief executive David Booth and presented to a conference in Australia recently.¹

The example compares the distribution of returns from investing in one-stock portfolios to investing in 100-stock portfolios over one-year, 10-year and 30-year periods in the US until the end of 2009. The portfolios are all randomly selected and the results are based on 100,000 simulations.

A normal distribution is shaped like a bell. The most frequently occurring outcomes (measured by the vertical axis) cluster around the average, which is why you get a raised centre. The frequencies of other outcomes noticeably decrease as values move away from the centre in either direction.

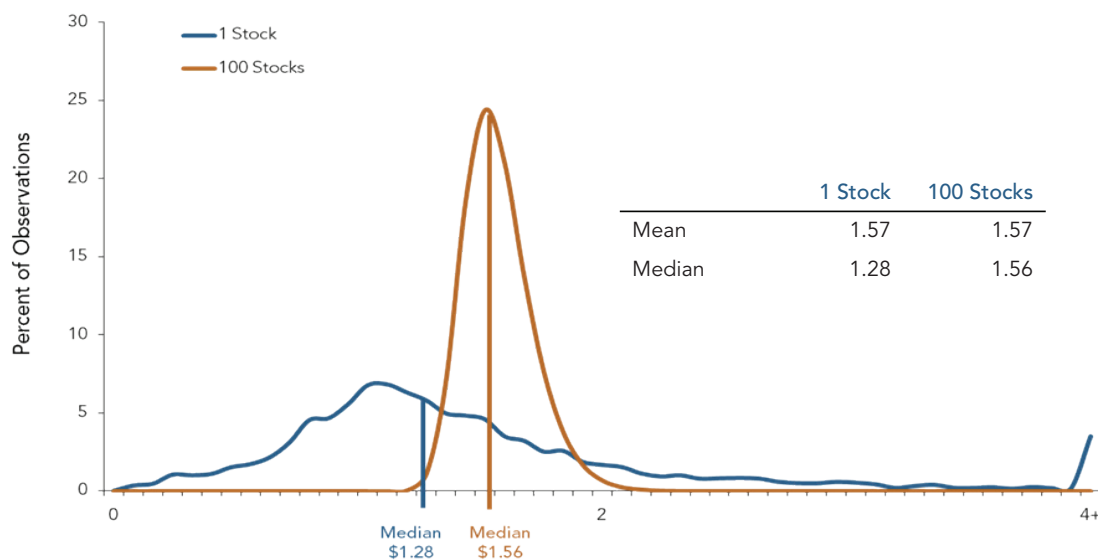
¹ David G. Booth, "A New Look at Diversification", Dimensional Advanced Conference, June 2010

There are a few things to focus on in these charts. Firstly look at the difference in distribution between the more diversified portfolio, the brown lines, and the one-stock portfolio, the blue line. You can see the distributions get more skewed for all portfolios, the longer the time period. But they are even more skewed for the single-stock portfolio.

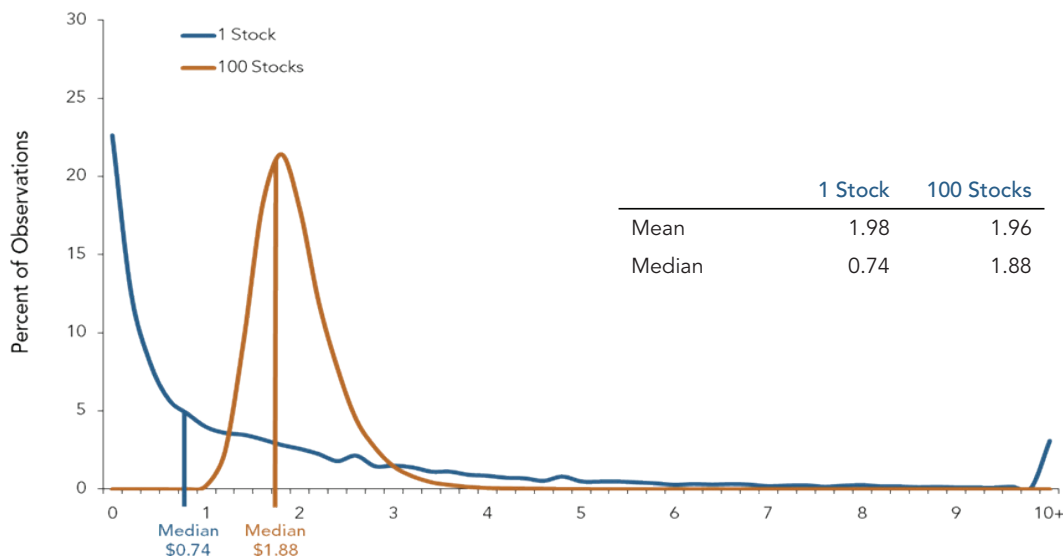
Now look at the difference between the average or mean return and the median return for the different portfolios. The *median* is always lower. This is because volatility, or more specifically variance, erodes the growth of wealth. The mathematics of this isn't important for this exercise. But it's enough to know that "average" returns don't translate into dollars in your pocket.

The third thing to notice is how the gap between the median and mean returns becomes wider the less diversified the portfolio becomes. This becomes most pronounced over 30 years. In this case, while there are similar mean returns for all portfolios, the median return (the one most relevant to the individual) is dramatically less in the single-stock portfolio.

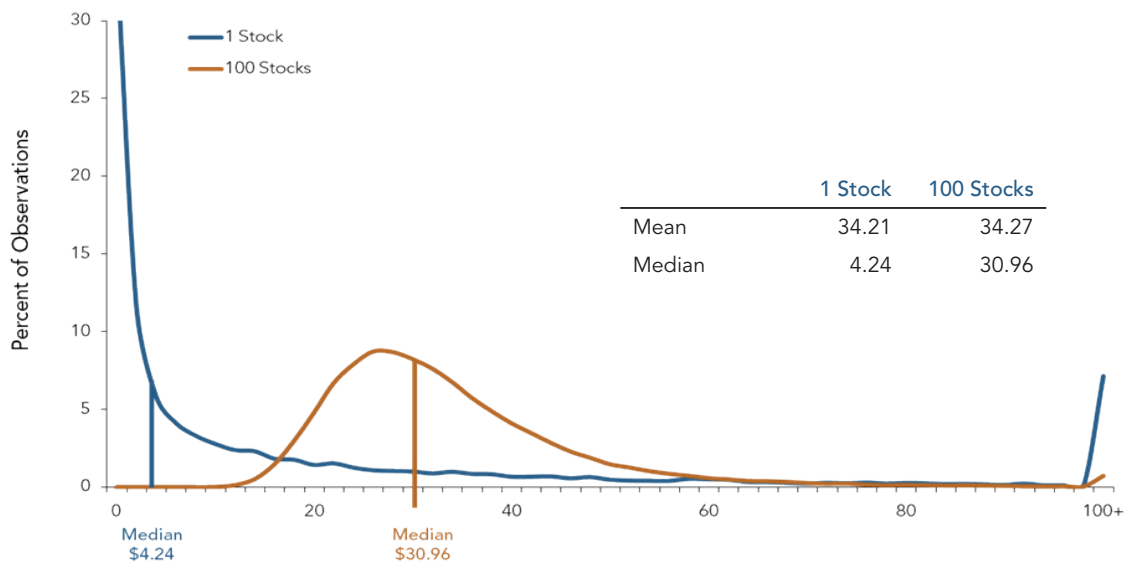
GROWTH OF A DOLLAR: ONE YEAR 100,000 SIMULATIONS JANUARY 2009-DECEMBER 2009



GROWTH OF A DOLLAR: TEN YEARS 100,000 SIMULATIONS JANUARY 2000-DECEMBER 2009



GROWTH OF A DOLLAR: THIRTY YEARS 100,000 SIMULATIONS JANUARY 1980-DECEMBER 2009



So you can see that in the one-stock portfolio, a median return of \$4.24 over a 30-year period is pretty dismal, particularly compared with the near \$31 median return from the 100-stock portfolio.

Now, can you see a bigger kicker for the one-stock portfolio at the far-right hand of the distribution graph in the 30-year example? All that means is that in a tiny number of cases, someone shot the lights out by being lucky enough to be in a single stock that outperformed the market by a significant degree.

But that's like our lottery ticket. You could get lucky, but it's a one in a million shot. And the fact is you don't need to take those kinds of risks. By diversifying your portfolio, you might be trading off the remote chance of enjoying that extreme gain, but you are not going to lose your shirt either.

This is what diversification is all about. You are reducing the "variance" of expected returns and maximising your chances of having enough money to retire on. Put another way, you're taming the luck of the draw.

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