LORING WARD

Portfolio Perspectives

Monthly Insights for Investors

Flip a Coin and Learn About Your Portfolio

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Even if you don't consider yourself much of a gambler, you probably can answer this question correctly: Are you likely to lose more money placing one $100 bet or 50 $2 bets?

If you answered the $100 bet you are right, but what does this have to do with investing?

Imagine that we flip a coin. If it comes up heads, I'll pay you $2; if it comes up tails, you'll pay me $1. We can play this game in any relative amount and we can flip the coin as many times in a row as you want. You have a 50% chance of receiving $2 and a 50% chance of having to pay $1. Therefore, your "expected value" on such a game would be 50 cents on each flip for every $1 you are willing to put at risk.

Now, let's say that you are willing to put $100 at risk — how should you play this game?

If you put your entire $100 at risk on one flip, then with certainty you are going to either lose the entire $100 or receive $200. And that is a pretty big gamble.

What if you spread your $100 bet into 5, 10, 20 or 50 bets? Each has you putting the same $100 at risk. And, each has an expected value of $50. However, they differ SIGNIFICANTLY in your odds or likelihood of losing money.

The table below shows you how the risk of losing money goes down as you spread your bet into smaller chunks:

If we bet our entire $100 in one shot, we stand a 50% chance of losing; however, if we spread the same $100 risk budget around into 50 bets of $2 apiece, we have the same expected value for the game ($50) but our chance of losing any money drops to almost zero.

Benefits of Diversifying a $100 Bet with a $50 Expected Value

Number of Bets Placed	1	2	5	10	20	50
Amount Per Bet	$100	$50	$20	$10	$5	$2
Total Amount Risked	$100	$100	$100	$100	$100	$100
Expected Value	$50	$50	$50	$50	$50	$50
Probability of Losing	50.00%	25.00%	18.75%	5.47%	0.59%	0.02%

Mathematicians refer to this phenomenon as the "Law of Large Numbers" and it drives every casino's profit margins. Casinos have a house edge built into every game, representing the average loss over the initial bet (for example, the house frequently has a 3% edge in roulette). Casinos know that the more times you make small bets (versus one large one) and the longer you continue, the more likely it is that you will give the casino its expected edge. If you

played a lot of roulette, chances are the house would make 3% on you.

The same holds true for investing, except that there is no house edge working against you.

We believe that there is a positive expected value to investing in stocks and bonds along certain dimensions/factors (style, market cap, profitability, term, credit). However, just as with our coin flip example, we know that we can never predict the outcome of investing in any one dimension or any one stock or bond during any one time period.

What we can say is that we believe there is a risk-reducing benefit from taking a large number of smaller positive expected value positions over taking a small number of larger bets.

We believe that we can help investors extract those factor premiums with greater likelihood the longer they stay invested and the greater the number of stocks they can hold that possess those factors within a diversified portfolio.

What Does This Mean to You?

We believe that you can make the "Law of Large Numbers" work for you by investing in a deeply diversified portfolio AND by staying diversified over time.

We know that taking "one, big coin flip" (risky concentrated bets or portfolios) may feel exhilarating, while diversifying with many small flips can feel like a drag because diversification doesn't seem to improve our expected returns.

However, diversification and long-term investing aren't about the thrill of seeing immediate big wins. And diversification is about more than just dampening overall portfolio volatility or lowering our risk. Diversification also improves our odds of success — and thus the reliability of our investing outcomes — and helps us capture those factor premiums when they do appear.

All investing involves risk, principal loss is possible. Past performance does not guarantee future results.

Diversification neither assures a profit nor guarantees against loss in a declining market.

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