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FOCUSED ON WHAT MATTERS MOST.

The Mathematics of Negative Returns – Why Avoiding Large Losses Matters

"Buy low, sell high". Everyone's heard of that one. In fact, we've probably all heard it so much we no longer have to think about the math behind it, we just *know* that means you've made money. There are some things you don't even have to think about any more, you just feel them. "Your average income tax rate is not the same as your marginal income tax rate". That one requires a little more thought, but yes, it makes sense; only the amount of taxable income that falls in the highest marginal bracket is taxed at that rate; the rest is taxed according to lower tax brackets, and at the end of it all your average tax rate is a blend of what you're paying for all the different tax brackets. Phew! That was a little more heavy lifting, but still, we've seen it enough where we understand it.

So why, then, are portfolio returns seemingly so tricky? Why do most people believe that if they lose 5% and then make 5% back, they would be at break-even? After all, the average of -5 and 5 is still 0, right? Well, not always. Let's look at the math.

First, the 5% loss: \$100 x (1 - .05) = \$95. So far, so good.

Now, the 5% gain: \$95 x (1 + .05) = \$99.75.

And there you have it. Were you to lose 5% and then gain 5% back, you'd be out 0.25%. Even when you start with the 5% gain and then suffer a 5% loss, you still end up losing 0.25%. This cruel little twist of math is why losses are worth minimizing: losses do more harm to investments than gains of the same order of magnitude help. Sure, a 0.25% loss isn't all that big of a deal; it's practically no loss at all. This brings us to our second bit of cruel math: the larger the loss, the harder it is to get back to break-even.

Let's look at the same loss and gain situation, but with a larger return factor of 20%:

\$100 x (1 - .2) = \$80; \$80 x (1 + .2) = \$96.

Down 20% and up 20% leaves you 4% short, which still isn't that big of a loss, but by the time you get to a 40%

loss and 40% gain, you're out 16%. As you continue to lose, it gets harder and harder to make it back, and by the time you're down 50%, you need a 100% gain to get back to break-even. The bigger the ups and downs, the more volatile the situation. If you remember last month's piece on volatility called "How to Play with Fire", you know that volatility is something that requires managing, and now you can see the math behind why that is.

The takeaways here are that even though the simple average of -5% and 5% is 0%, you do not get back to break-even when your investments experience those returns. Likewise, even though both -5% and 5%, and -20% and 20% have a simple average of 0%, the impact on your investments is not the same when experiencing those particular loss and gain combinations; down and up 20% leaves you worse off than down and up 5%.

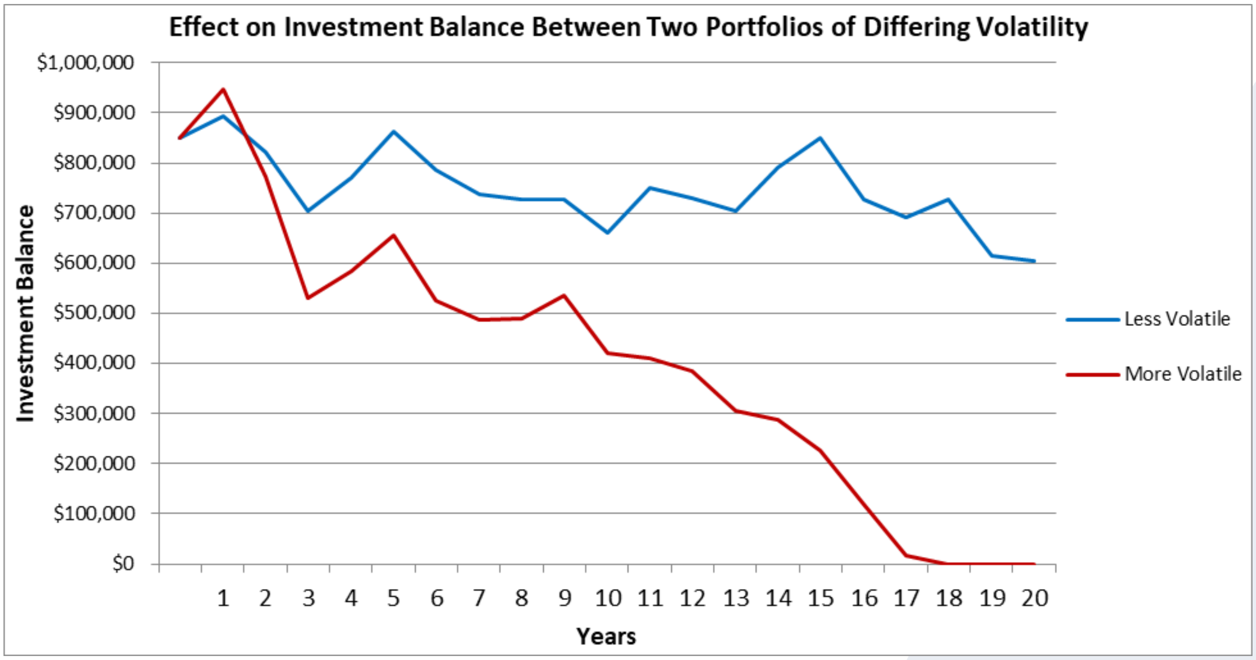
Here's an important point on terminology. We use terms like "average return", "annual return", or "average annual returns" quite frequently in our monthly pieces. What we have been discussing here is the "average of returns". In other words, add them all up and divide by how many there are. That's a simple average. We believe this is how many people estimate their investment returns. However, that is not how the math of calculating average returns works. For example, if one portfolio makes 14% one year and 1% the next, the average of those returns is 7.5%. Another portfolio can earn 7.5% one year, 7.5% the next, and have the same average of returns, so shouldn't their balances be equal after those two years? Actually, no. If both portfolios started with $1,000, the first would have $1,151 after two years, but the second would have $1,156. The average of their returns might be the same, but their average annual returns are different. Why couldn't math have been so interesting when we were in 8th grade?!

Now that we've done the prerequisite work on why losses matter as much as they do, let's look at how losses work inside portfolios to compound the harm for investors. To make this analysis mirror the real world as much as possible, we're going to look at what two 40% bond, 60% stock portfolios returned over a 20 year period from 1972 – 1991. Each tracks the ups and downs of the stock and bond markets over that period, and both have the exact same average of returns of 10.6%. However, one portfolio is 50% more volatile than the other, which can happen when portfolios have the same general exposure to stocks and bonds but contain different specific securities. Therefore, though the portfolio with the more volatile investments experiences larger gains, it also experiences larger losses. For anyone who wants a detailed look at the annual returns of the two portfolios, they are as follows:

Portfolio/Year	**1972**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**
Less Volatile	9.2%	-3.5%	-9.2%	17.0%	19.1%	-2.0%	2.1%	7.8%	10.9%	3.0%
More Volatile	15.6%	-14.3%	-25.9%	20.0%	22.3%	-11.0%	5.1%	15.0%	24.8%	-4.7%

Portfolio/Year	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**
Less Volatile	27.9%	10.9%	10.7%	27.9%	22.0%	-0.7%	11.5%	23.2%	2.5%	21.1%
More Volatile	20.4%	18.5%	6.2%	30.1%	18.5%	3.7%	14.9%	28.7%	-3.1%	27.2%

In this analysis, we're going to show the effects of choosing a less volatile portfolio versus a more volatile one on a retired investor with $36,000 of fixed income from social security, annual expenses starting at $72,000, and a starting investment balance of $850,000. We're going to inflate the income and expenses by the annual social security increases and inflation experienced between 1972 and 1991. Considering where our economy and money supply is today, using inflation metrics from the 1970's seems appropriate. With both portfolios' average of returns over 10% for the time period, the fact that this investor is withdrawing around 4% to meet his or her expense needs seems reasonable.



This right here is why avoiding large losses matters. Both portfolios have the same 10%+ average of returns over the 20 years, but one is more volatile and loses more during most market downturns. Even though the average of returns for both portfolios was over 10% for 20 years, the 4% distributions needed to close the expense gap were not sustainable for the portfolio with the bigger losses, even though it also had bigger gains. Even for investors who are not retired, any withdrawal, and that includes panicking and selling when investment values plummet, can lock losses in and permanently damage investment growth. Two portfolios with the same average returns can experience very different outcomes, which is why understanding some of the math behind investment losses is important. Increased volatility can lead to larger losses when investments turn negative, and even a portfolio with a higher average return can still lead to a bad outcome if the large losses come at the wrong time, or are coupled with portfolio distributions.

While not as surprising as finding out 1 + 1 doesn't equal 2, finding out losing 5% and then making 5% back doesn't get a portfolio back to break-even still catches most investors by surprise. Learning that two portfolios with the same average returns can lead to different outcomes is also similarly eye-opening. What losses can do to portfolios should always be taken into account when evaluating what to own at any given time, because some holes can get too deep to dig out of. Minimizing losses should be as intuitive as "buy low, sell high", but not enough investors know the math involved. In the spirit of the back to school season we have a pop quiz to end this article:

Question: When is the best time to minimize your investment losses?

Answer: Before they happen.

Our View of Things

Before getting into a fairly high-level overview of markets as we see them, we thought it worth commenting on a few more socio-macro themes. Not only do these things matter because they affect our day-to-day lives more directly than markets, but they ultimately create the landscape in which markets function.

First, and we've commented on this quite a bit, the rift between the haves and have-nots is increasing at an accelerating rate. Regardless of one's politics, it should be clear as day that people seem more uneasy, stressed, and in some cases just plain angry than was the case 1, 3, or 5 years ago. The reasons for this over and above those socio-economic related we won't get into here as some are clear, and others less so. These emotions can be good if they lead to productive change across society, such as a rebalancing of power and opportunity. We're optimistic on this front. However, they can also be detrimental if not channeled in a positive way. Our challenge to ourselves and all we have the good fortune to influence is to do something positive with any emotion we may be feeling as a result of current events, social injustices, or other more personal stressors that may be bearing down on us. Smile more, be kind to others, and don't let others who are having a harder time with that affect you negatively. Meet them with a positive disposition. In addition, take small steps to influence positive change within your local community where you spot unfairness or injustice. These things can't be legislated, but must manifest organically as principle driven norms. As much as we love what we do, life is about way more than financial markets. They are but one tool that can help us along the way.

Second, and certainly related, when it comes to thinking about what a fair, decent, and prosperous society should look like, it seems to us that more weight should be given to the longer-term health of the economy than to the level of financial market prices. We are in no way discounting the role that financial markets can play in helping to lubricate the economic gears, but when a good number of employees take a job based on stock incentives rather than salary and benefits, something's off. When almost every evening news channel flashes a stock market update on the screen when far too many Americans are holding down two jobs to make ends meet and own little to no stock, something's off. When our Central Bank whose role it is to maintain stable prices and to be lender of last resort in the event financial markets freeze explicitly takes policy action to increase stock, bond, and other financial asset prices enriching the relative few who own such assets and helping to foster a casino-like economy where the focus is on maximizing shareholder value in the short-term (minimizing costs such as wages and long-term investment), stock options (not available to all thus contributing to the wealth gap), and accumulating debt (to aid short-term profits or extend existing maturing debt), we've lost our way.

This market-centric culture and everything that perpetuates it is exactly the sort of thing that drives a wedge between different factions of society. A strong and prosperous economy doesn't need constantly rising asset prices. Financial markets that function smoothly, at reasonable interest rates are crucial, but beyond making sure they are open and free, there should be virtually no effort made to control the direction of markets. The focus needs to swing back to our economy, the people within it, and making sure employees and customers are placed above shareholders. That's not to say investors aren't important, but by default, they will be served just fine if the focus is placed on the workplace and customers. It's when management and society as a whole take action with short-term profits in mind that the Rube Goldburg machine of wealth inequality gets put into motion. Short-termism is the enemy of a fair, balanced, and sustainable system. Anyone taking overt action to manipulate financial asset prices higher is part of the problem we're facing today with respect to wealth inequality. This benefits those who have assets and leaves the rest behind.

The truth is, with asset prices where they are now, the ability for new investors who don't yet have much wealth to make money in stocks over the medium to long term is terrible. The excessive focus on markets over the years has created a bit of a situation where we've borrowed growth from the future in order to keep the economy chugging via the use of extreme levels of debt and the unwillingness to allow bloated, inefficient companies to fail. The result of this is extreme market valuations coupled with a sclerotic economy that lacks the ability for fresh, robust growth going forward – an extremely problematic combination over the coming 10-20 years. We can get upset about this or we can focus on those things that are within our control – educating others on what most likely lies ahead, the risks associated with it, and structuring our lives and portfolios in anticipation of it. I think we can all agree that we'd like our children to have decent investment opportunities. More importantly, we'd like them to have secure employment opportunities. These two go hand in hand. If we focus on the latter, they'll get the former.

That said, hopefully there will always be financial markets, because not only do we love them, but they are a tool that can be used to facilitate economic growth and prosperity. With that in mind, here's a concise bullet-pointed list of what we've observed in September:

- Stocks have corrected more than -6% in September, wiping out all gains from August, per the S&P 500. Volatility has also picked up in the process. This bears watching since it has corresponded with terrible market breadth coupled with extreme investor sentiment. In other words, the summer rally has been losing steam with respect to the number of stocks that were still going up and investors haven't seemed to notice. This is characteristic of market turning points, which could imply more downside to come in the short term.

- Also, in September, gold is down ~-5%, mining shares down ~-9%, and longer dated treasury bonds are up ~+1.5%. So far, correlations have been very high across most asset classes in September limiting the benefits of diversification. As we saw in March, during those periods of time where this occurs, it's important to differentiate the assets that have a high probability of moving lower for longer from those that should be down more temporarily.

- To this end, given our outlook that economic growth is likely to continue slowing over the next quarter or two, we continue to favor the asset classes that tend to perform best in a slow growth environment – mainly U.S. government bonds and precious metals.

- The question still remains whether we'll see inflationary or deflationary impulses over the coming months. The falling U.S. Dollar coming into September was fostering price increases around most commodities (inflation), but so far in September the dollar has risen; somewhat dramatically in the last week or so. If this trend continues, we could see continued pressure on commodity prices and thus a more deflationary impulse. The good news is that U.S. Government bonds and precious metals tend to do well regardless. It's the rest of the commodity suite along with energy that would prefer a bit of inflation. At this point, it seems a risky juncture to take on more broad commodity exposure until we have a better read on which way the inflation needle will move.

- There's good reason to believe that with the election coming up, volatility across all asset classes will likely move higher. It's important to expect this and make sure you're in the asset classes that have the best chance of either positive volatility or short-lived bouts of volatility. Again, U.S. Treasuries and precious metals seem better prepared in this respect. We have an expression that any investment worth owning today comes with volatility. The inverse of this of course is that those not worth owning either come with none or more. As we discussed last month in "How to Play With Fire", some volatility is not only unavoidable, but good.

- The divergence between what stocks and other financial markets are experiencing right now and the economic and social reality is vast. As we've written about, we're setting records in this respect and as a result, we should expect anything across financial markets. Our expectation is that stock markets "catch down" to those underpinning realities over the coming months with the bounce over the summer months being nothing more than a giant mega-cap driven bear market rally. Take the biggest companies out of the mix and stocks are not at all-time highs. They are lower than they were two years ago. This broad downtrend could well continue and based on math, history, and economic gravity, should be expected. That said, crazy can always get a little crazier. Markets could go up further in the short term. We should expect this too. Our positioning in the portfolios we manage for our clients takes both of these possibilities into account.

There's never been a more important time to pay attention. From a personal economic standpoint, our financial future could well depend on it. As we pointed out in the first segment, losing half of one's portfolio can be impossible to fully recover from. On this point, our focus every day is to do our best to make sure our clients are one step ahead of what's coming and not being led over the same ledge as most other investors – in most cases through no fault of their own.

But it's also crucially important to make sure we're paying attention to what's going on outside of our portfolios. What's happening in my community? How am I feeling? How am I treating others? These are the real issues of the day and how we can all have the biggest impact on the world we live in. If we all collectively do better to be better, to ourselves and those around us, we win. As Ben Hunt from Epsilon Theory talks about, we can start small, within our local communities, where the "pack" takes care of itself – a bottom-up approach as opposed to the top-down political approach we all tend to assume will fix things. Interesting concept. Even more interesting to think about how the vibe out there today would change if every person within every community across the country focused on empathizing with their neighbor or their neighbor's neighbor. Think globally, but act locally. There's no risk in this. Talk about return on investment.

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