

Can 1+1 Really Equal 3?

Yes, Virginia, there is a Santa Claus

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Most of us know that it is prudent to not have all our eggs in one basket. We know this because in the event of loss we don't want to lose everything. Investing is no different. Holding one stock is the single best way to get very wealthy. Unfortunately it is also the best way to find yourself in the poor house. A prudent investor knows instinctively they should spread their bets around.

But there is another benefit to diversification: The return of a collection of assets can be greater than the sum of its parts. SAY WHAT!?

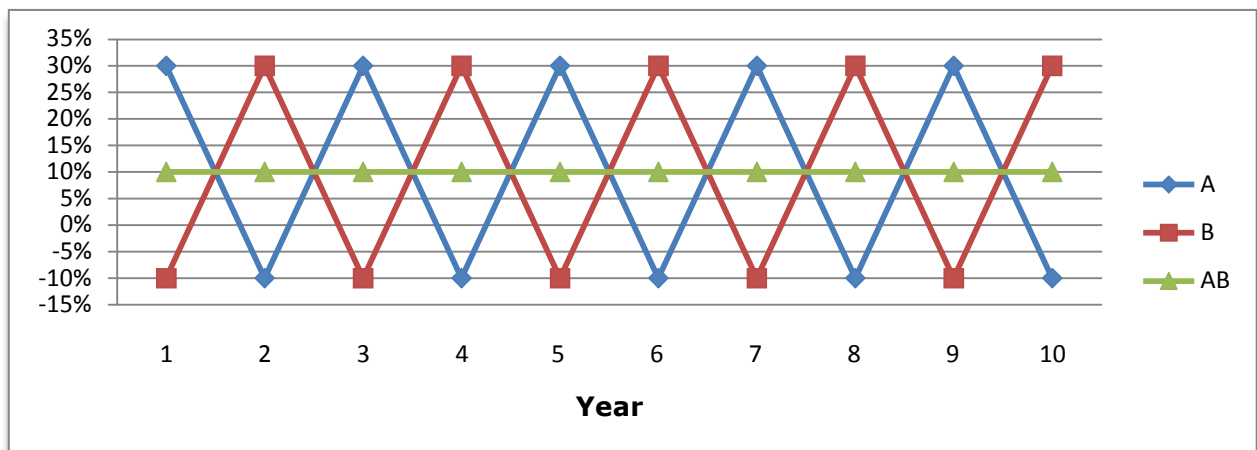
Yes, 1+1 can really equal 3 (or at least more than 2).

To understand this you must first know what is meant by *correlation*. Correlation is a term used in statistics to describe the relationship of two entities. If two entities move perfectly and positively with the other, they are said to have a correlation of "1". If two entities move perfectly opposite one another they are said to have a correlation of "-1". If the movements of two entities are totally unrelated to one another, they are said to have a correlation of "0", or no correlation.

Since most investments in the real world have at least some correlation, correlations generally fall somewhere between 0 & 1, but for our example I will use two investments that are perfectly negatively correlated, thus have a correlation of -1. This assumption makes the math a bit easier to digest.

Example:

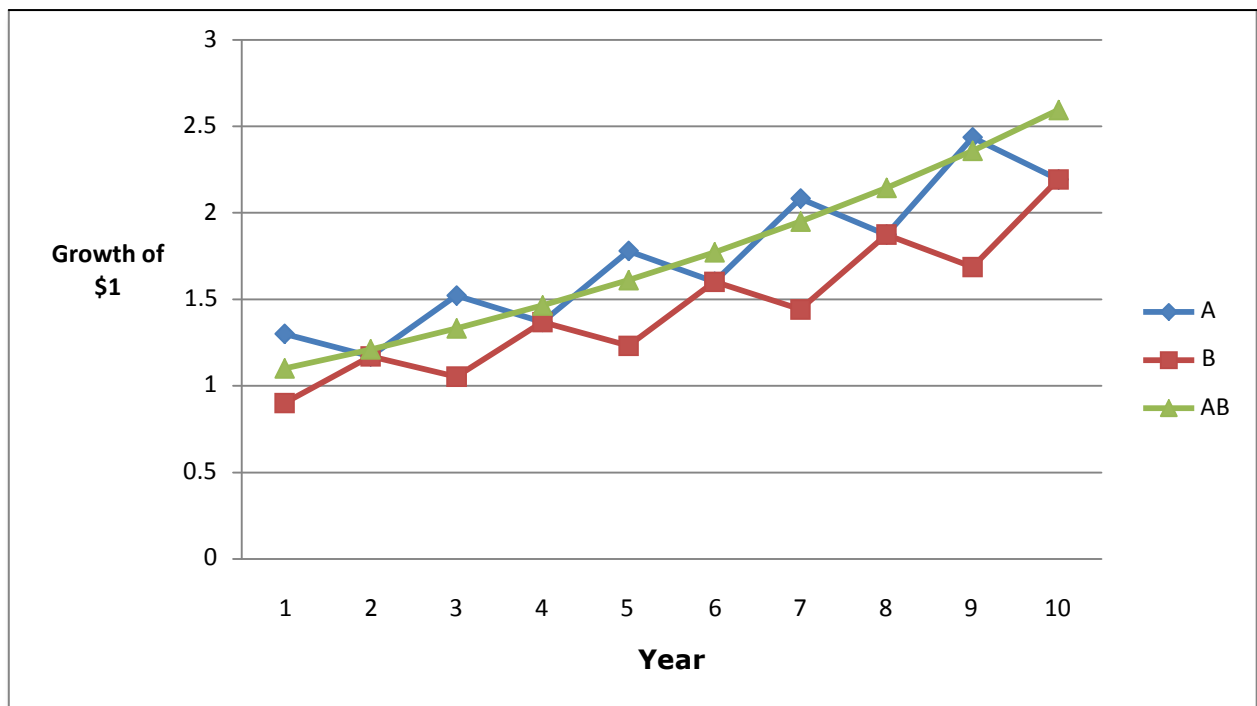
Investment A & B each have very good years and very poor years. In good years they have returns of +30%. In bad years they lose 10%. As A & B have a correlation of -1, a good year for A is a bad year for B; and vice-versa. Their annual performance is charted as follows:



Each investment on its own has an average annual return of 10% over the 10 years, so why not just own one of them instead of both? The answer is twofold.

First, combining them will help us sleep better knowing we are consistently earning 10% each year. Holding on through volatile years is simply too unsettling for most of us to bear.

Secondly, the actual return of the combined portfolio is higher due to an annually *compounded* return of 10%. That's right. The return of the combined portfolio is larger than either of the two components alone. Here is a chart of the value of each investment: A, B, and AB combined.



So there you have it. It is possible for a collection of investments to yield more than any one of the investments on its own. But, you ask, "Does this occur in the real world?"

As mentioned previously there are no assets that are perfectly negatively correlated. Most assets are not *perfectly* correlated; thus the opportunity for "excess" returns *does* actually exist. Further, adopting an allocation target and occasionally rebalancing to it "supercharges" this effect. Taken as a whole, this is the reason why no single investment should be evaluated in isolation, but instead how well a collection of assets performs as a whole.

A real world example of this effect can be seen by analyzing 32 years worth of returns for the S&P500 and EAFE indices. The S&P500 basically consists of the largest 500 companies in the U.S., while the EAFE index attempts to track the largest companies of the non-U.S. developed world (Europe, Australia, and Far East developed nations).

This analysis begins in 1968 (the year when the EAFE index began to be measured) and ends in the year 2000. We will assume that 50% is allocated to each index, and then rebalanced back to the 50:50 target allocations every two years.

During this timeframe, the S&P500 annualized return was 12.17% while EAFE's was 11.89%. The unsophisticated investor would jump to the conclusion that the S&P500 was the superior investment, but you know that may not necessarily be the case. In fact, an S&P500 investor would have had to be *quite* patient. He would have seen the EAFE index outperform for the first 22 years while sitting by holding onto the laggard S&P index. Not until the 1990s did this investor's patience pay off. Most investors don't have the patience to wait 2 years much less 22!

In the meantime, the investor with a 50:50 target allocation did quite well the first 22 years, but his investment policy caused him to continually sell a portion of his "winner" in order to purchase more of the "loser". He stuck with this policy through thick and thin while his friends were busy chasing returns. It wasn't easy for him, but he formulated a well-thought out plan and stuck with it without letting his emotions take over. Logic and history told him neither outperformance nor underperformance of an asset class could last forever.

At the end of the 32 years the disciplined investor earned an annualized return of 12.62% which is better than either of the vehicles on their own. This additional performance would have caused an investor with \$1million at the beginning of the period to earn \$154k over what the seemingly better performing S&P investment would have provided alone.

As it turns out, similar rebalancing strategies have been found to consistently add, on average, an additional .50% of annual returns over the long term. An investor attempting to time the market during this period would have had a 90% chance of not even receiving market returns. Most likely, such an investor would have received much less. According to a recent study by DALBAR, Inc., the average investor lagged S&P500 index returns by 6.48% per year for the 20 years ending 2008. These investor returns did not even exceed the rate of inflation so they actually lost money!!

The evidence is clear

The return of a collection of investments can be greater than the sum of its parts *and* greater than that of its best performing constituent, but in order to obtain such results an investor must develop a well thought out investment policy and adhere to it through good times and bad.