AUSTIN VALUE CAPITAL

Holding Period, Taxes, and Required Performance

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Most investors today should seemingly be aware of the benefits of long term holdings. However, their actions tend to indicate otherwise. In particular, most participants in the stock market currently act as renters, not owners, frequently and impatiently trading their positions in an attempt to "beat the market". In doing so, they violate Warren Buffett's Fourth Law of Motion: "For investors as a whole, returns decrease as motion increases". In other words, as the number of stock market transactions increases, resulting in shorter holding periods, the returns to investors as a whole must necessarily decrease due to higher frictional costs, i.e., increased brokerage fees and higher taxes.

However, the negative tax implications of short term holding periods, **including those greater than a year**, are not widely discussed in the literature. This is likely no accident, as such a discussion would not be favorable to most hyperactive investment funds. In addition, the few articles that do mention the tax benefits of investing for the long term generally provide little or no explanation or detail about the real advantages. Rather, as with many concepts in finance, and as I remember from college, the specifics have been "left as an exercise for the reader"[1]. Because taxes have such a large impact on our partners' results, and investors in general, I decided to undertake this exercise and show the relationship between holding periods, taxes, and pre- and post-tax returns. Fortunately, the math of finance is much simpler than the exercises I remember from my Physical Chemistry texts!

Taxable Events and After-Tax Returns

As might be expected from Buffett's Fourth Law of Motion, there is a direct relationship between after-tax returns and the number of instances when investment gains are taxed (i.e., taxable events)—specifically, the more taxable events, the less the annualized rate of return[2]. This relationship has direct implications on holding periods for portfolios. For example, if a portfolio has, on average, a one year holding period, where positions are generally sold a year after they are purchased, the after-tax results will be lower than another portfolio that has a multi-year holding period, assuming a same pre-tax rate of return, since there are more taxable events for the one year holding period portfolio than for the multi-year holding period portfolio.

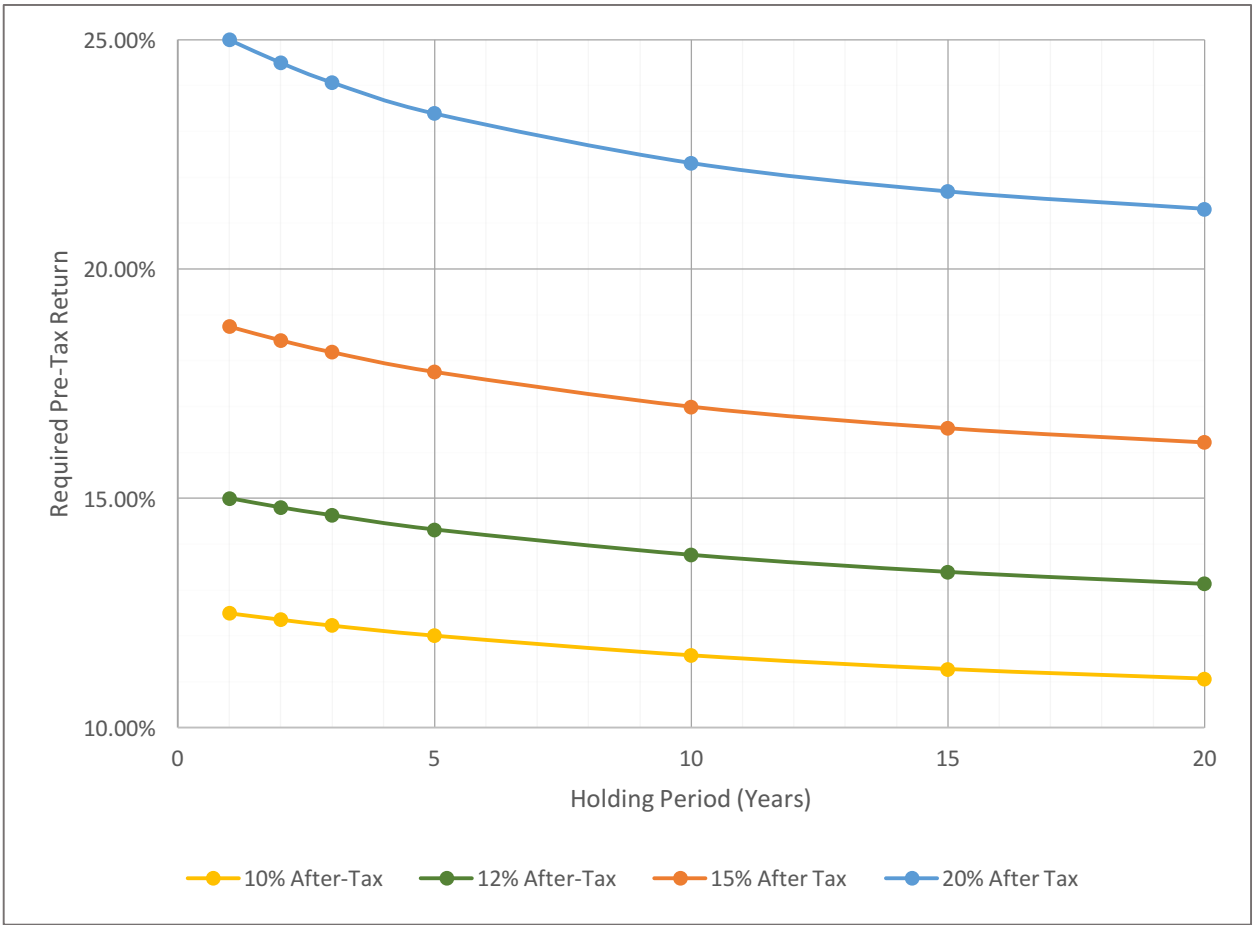
The following table and graph illustrates the annualized pre-tax returns required to achieve a given annualized after-tax return across different holding periods, assuming a 20% tax rate.

[1] Save for an excellent, though somewhat unfocused essay from Tweedy Browne, "Investing for Higher After-Tax Returns", currently in revision

[2] Note that the timing of the taxable event does not particularly matter; for example, using the same tax-rate and the same rate of growth, there is no difference in returns between a pre-tax retirement account, such as an IRA, where pre-tax money is invested and taxed upon withdrawal, and a post-tax retirement account, such as a Roth-IRA, where post-tax money is invested, but is not taxed upon withdrawal.

Annualized Pre-Tax Returns Required to Achieve After-Tax Returns for Various Holding Periods

	10% After Tax	12% After Tax	15% After Tax	20% After Tax
1 year	12.5%	15%	18.75%	25%
2 years	12.36%	14.8%	18.45%	24.5%
3 years	12.23%	14.63%	18.19%	24.07%
5 years	12.01%	14.32%	17.76%	23.39%
10 years	11.58%	13.77%	17%	22.31%
15 years	11.28%	13.4%	16.53%	21.69%
20 years	11.07%	13.14%	16.22%	21.31%



From the table and graph, it is clear that as the length of the holding period increases, the pre-tax returns required to achieve the given after-tax return decreases. Viewed in the opposite manner, as the holding period gets shorter, the investor is required to generate larger pre-tax returns to obtain the same after-tax result. Thus, as the investor's holding period becomes shorter, he must produce correspondingly better pre-tax results just to keep up with the longer-term investors' after-tax results.

To illustrate this, consider two investors, Steven Short Term and Laura Long Term, or Steve and Laura for short. Steve is a trader, constantly buying and selling stocks with a time horizon measured in months, weeks, or even days. Laura, on the other hand, is a value investor with a long-term horizon, studying individual businesses and buying with a long-term horizon in mind, often with a holding period of 5 years or longer. Due to his short term horizon, Steve is required to turn in better pre-tax results than Laura year after year just to match Laura's after-tax results. For now, we will give Steve the benefit of assuming he is able to hold his positions for one year on average, despite his natural urge to frenetically trade his positions on a daily basis. At the same time, we will assume that Laura has a 10 year holding period. Under these assumptions, for each of them to achieve a 15% after-tax return, Steve must generate an 18.75% annualized pre-tax return, while Laura will only need a 17% pre-tax annualized return, a difference of 1.75% each year!

Relationship between Holding Period and After-Tax Returns

First, for the mathematically inclined, I have derived the growth formulas for an arbitrary holding period and a one year holding period; however, since the majority of readers may not wish to revisit growth equations, I have relegated the math and explanation to an Appendix, as an exercise for the writer. For the ambitious, feel free to check my work.

For everyone else, there are a few other mental models to consider. For example, Buffett and his partner, Charlie Munger, have repeatedly used the "interest-free loan from the government" concept as an explanation in their various letters and interviews. This model is based on the fact that an investor (e.g., an individual investor or a corporation) can amass capital gains in his stock portfolio without any requirement to pay taxes on those gains until an actual stock sale occurs. Because these taxes are not required to be paid until a sale event occurs, as the value of an investor's stock grows, the investor is able to achieve additional compounded growth on the untaxed portion of the gains. Obviously, this additional compounded growth would simply not be available if the "untaxed portion" was in fact taxed by the government. This extra compounding does not change the fact that the investor will have a liability to pay taxes on these gains when the stock is ultimately sold, but this liability is "deferred" until the actual stock sale does occur. Hence, this latent tax liability is referred to in accounting as a "deferred tax liability". Thus, as is the case for Berkshire Hathaway (and previously Wesco), the "deferred tax liability" listed on a company's balance sheet represents taxes that would be owed if the position or asset was sold. In virtually every one of his annual Wesco letters beginning in 1997, Charlie Munger used the following text to describe this liability (emphasis added):

> *The foregoing $248-per-share book value approximates liquidation value assuming that all Wesco's non-security assets would liquidate, after taxes, at book value. Probably, this assumption is too conservative. But our computation of liquidation value is unlikely to be too low by more than two or three dollars per Wesco share, because (1) the liquidation*

value of Wesco's consolidated real estate holdings (where interesting potential now lies almost entirely in Wesco's equity in its office property in Pasadena) containing only 125,000 net rentable square feet, and (2) unrealized appreciation in other assets (primarily Precision Steel) cannot be large enough, in relation to Wesco's overall size, to change very much the overall computation of after-tax liquidating value.

***Of course, so long as Wesco does not liquidate, and does not sell any appreciated assets**, it has, in effect, **an interest-free "loan" from the government** equal to its deferred income taxes on both the unrealized gains and gains deferred from the merger of Salomon into Travelers in 1997, subtracted in determining its net worth. **This interest-free "loan" from the government is at this moment working for Wesco shareholders and amounted to about $102 per Wesco share at year end 1997**.*

Thus, the decision by the federal government to delay taxation of capital gains until the time of sale essentially allows an investor to keep more of his money working for him until the sale event occurs. In particular, the investor can use money that is actually "owed to the government" on his own behalf to generate compounded returns, and hence this money can be considered an "interest free loan" from the government. The longer the investor's holding period, i.e., the longer the investor can "put off the tax man", the longer he realizes the benefits of this interest free loan.

My own personal way of thinking about this "extra" compounding is based on a hypothetical situation involving a company that pays dividends. Consider the following example, using our two investors, Laura and Steve:

> Initially, both Laura and Steve purchase 100 shares of a company for $10 each, where the underlying business earns $2 per share and pays a dividend of $1 per share. In the next year, the company's earnings double to $4; the company decides to maintain its 50% dividend payout, and as a consequence, the dividend is also doubled to $2 a share. At the same time, the stock price also doubles to $20, reflecting the increase in value of the company. Now, consider dividends received for our two managers if Steve sells the stock and purchases another similar stock having the same dividend and price, and Laura holds the same stock for another year:
>
> <u>Steve: Received Dividends for Sold and Purchased Stock</u>
>
> Steve owes taxes for the $1000 in gains, resulting from the price appreciation of the stock from $10 to $20. Assuming a tax rate of 20%, this gives Steve $1800 available for his next stock purchase. Using this $1800, only 90 shares of the subsequent, similar stock can be purchased. As a result of this sale and purchase, in the next year Steve will receive $180 dollars in dividends.
>
> <u>Laura: Received Dividends for Held Stock</u>
>
> Instead of selling, Laura continues to hold the original 100 shares of the company, which is now paying a $2 dividend per share. Since Laura did not effect a taxable event by selling, she will receive a full $200 dollars in dividends in the next year.

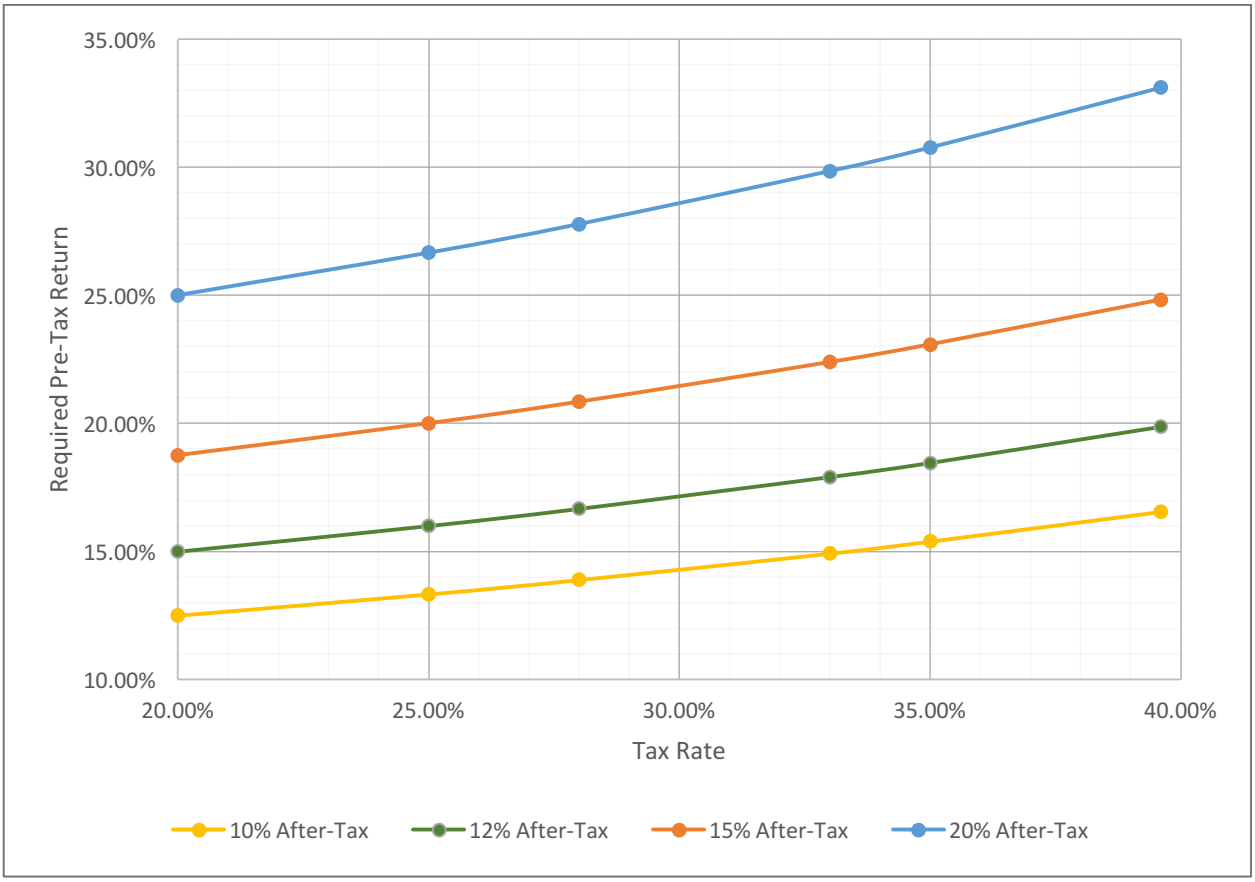
Thus, we can easily see that this "loan" from the government has given Laura an additional $20 in dividends that Steve lost by selling the original stock and purchasing another similar one. This same principle applies to non-dividend stocks, but is not as obvious since the earnings are retained by the company.

Considering Holding Periods of Less than a Year

When stocks are bought and sold within a time period less than a year, the length of the holding period within that year does not affect an investor's post-tax return. This is because the federal government only taxes investors once per year, and hence all transactions of less than a year receive the same short term capital gains treatment. Thus, regardless of whether the investor's average holding period is one day or 11 months, his tax treatment will be the same at tax day. In the U.S., stocks that are held for less than a year are generally taxed at considerably higher rates than the 20% rate assumed above, which is a typical long-term tax rate. Accordingly, for holding periods of less than a year, the investor's short term capital gains tax rate (or marginal tax rate) is the predominant factor affecting his required pre-tax returns to obtain a desired after-tax return. Similar to the earlier example above, the following table and graph show the required annualized pre-tax rates of return for given after-tax annualized rates of return, at different tax rates and assuming a less than one year holding period:

Annualized Pre-Tax Returns Required to Achieve After-Tax Returns for Various Tax Rates (Investments Held for Less than One Year)

	20% Tax Rate	**25% Tax Rate**	**28% Tax Rate**	**33% Tax Rate**	**35% Tax Rate**	**39.6% Tax Rate**
10% After Tax	12.5%	13.33%	13.89%	14.92%	15.39%	16.55%
12% After Tax	15%	16%	16.67%	17.91%	18.46%	19.87%
15% After Tax	18.75%	20%	20.84%	22.39%	23.08%	24.83%
20% After Tax	25%	26.66%	27.78%	29.85%	30.77%	33.11%



From the table and graph, we can see that when short term capital gains are taxed at the current top tax bracket in the U.S, a stunning 33.11% pre-tax return is required to achieve 20% after-tax returns, a difference of 13.11%! Even at the 28% tax bracket, achieving a 15% after-tax return on short-term gains requires a 20.84% pre-tax return.

Turning back to our favorite investors, Laura and Steve, we will now revert Steve's holding period from the generous one year holding period to his expected months/weeks/days time frame, assuming a marginal tax rate of 33%. At the same time, for some sense of fairness, we will also shorten Laura's holding period from 10 years to 5 years, but since she will be paying long term tax rates, we will leave her tax rate at 20%. Under these assumptions, Laura must generate 17.76% pre-tax returns to achieve 15% after-tax returns, while Steven must generate 22.39% pre-tax returns, a difference of 4.63% **per year**. This difference widens significantly if Steve were in a higher tax bracket.

Conclusions

Although I have my own personal opinion, this essay is not intended to advocate a particular strategy or holding period, but instead to show the relationship between holding periods, tax rates, and pre- and post-tax returns. However, from the tables and graphs, it is clear that a strategy of holding stock purchases for the long term will outperform a short term holding strategy, **assuming equivalent pre-tax gains in the respective strategies**. Even assuming that individuals with superior investing skills could reliably generate higher pre-tax returns using shorter holding periods, those returns must be considerably

better than the pre-tax results of investors using longer holding periods in order to have equivalent after-tax results. Given current short term capital gains tax rates, I generally have strong doubts that investors can outperform over the long term while having holding periods of less than a year, particular for those in high tax brackets.

To close, perhaps yet another example would be helpful, and from who better than Buffett himself? Although he does not delve into the specifics of different holding periods and tax rates, Buffett distills this topic into a form that any reader can grasp in his 1989 Berkshire Hathaway shareholder letter:

> *Because of the way the tax law works, the Rip Van Winkle style of investing that we favor - if successful - has an important mathematical edge over a more frenzied approach. Let's look at an extreme comparison.*
>
> *Imagine that Berkshire only had $1, which we put in a security that doubled by yearend and was then sold. Imagine further that we used the after-tax proceeds to repeat this process in each of the next 19 years, scoring a double each time. At the end of the 20 years, the 34% capital gains tax that we would have paid on the profits from each sale would have delivered about $13,000 to the government and we would be left with about $25,250. Not bad. If, however, we made a single fantastic investment that itself doubled 20 times during the 20 years, our dollar would grow to $1,048,576. Were we then to cash out, we would pay a 34% tax of roughly $356,500 and be left with about $692,000.*
>
> *The sole reason for this staggering difference in results would be the timing of tax payments. Interestingly, the government would gain from Scenario 2 in exactly the same 27:1 ratio as we - taking in taxes of $356,500 versus $13,000 - though, admittedly, it would have to wait for its money.*
>
> *We have not, we should stress, adopted our strategy favoring long-term investment commitments because of these mathematics. Indeed, it is possible we could earn greater after-tax returns by moving rather frequently from one investment to another. Many years ago, that's exactly what Charlie and I did.*
>
> *Now we would rather stay put, even if that means slightly lower returns. Our reason is simple: We have found splendid business relationships to be so rare and so enjoyable that we want to retain all we develop. This decision is particularly easy for us because we feel that these relationships will produce good - though perhaps not optimal - financial results. Considering that, we think it makes little sense for us to give up time with people we know to be interesting and admirable for time with others we do not know and who are likely to have human qualities far closer to average. That would be akin to marrying for money - a mistake under most circumstances, insanity if one is already rich.*

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Appendix

The growth formulas for an arbitrary holding period (measured in years) and a 1 year holding period are presented below.

The growth formula for an arbitrary holding period (where the holding period is the same as the period of years under consideration) is given by:

$$x_y = x_0 * (g^y - t * (g^y - 1))$$

where:

x_n = value of the money at year n;
y = number of years;
g = 1 + annualized rate of return; and
t = tax rate.

Putting the above formula into plain English, for a given number of *y* years, the amount of money gained for a holding period of *y* years equals the initial amount of money (x_0), multiplied by the growth rate, raised to the number of years *y* (g^y) minus the effect of taxes, represented by $t * (g^y - 1)$.

The growth formula for a one year holding period, over a period of *y* years, is given by:

$$x_y = x_0 * (g - t * (g - 1))^y$$

From the formulas above, we can see that with the arbitrary holding period, over a period of *y* years, the growth rate itself is not modified, and accordingly, the resulting amount is taxed after the compounding is applied. This is due to the fact that there is only a single taxable event in the first equation. However, with the one year holding period, which is over the same *y* years, the growth rate is modified by taxes **before** the initial amount is compounded by the exponent. Thus, it is clear that the resulting multiplier to the initial amount of money (x_0) must be lower for the one year holding period than the arbitrary holding period when *y* is greater than 1. The same type of relationship occurs between other holding periods, i.e., the degree to which the taxes affect the after-tax compounding rate decreases with increasing holding periods.

As an example, consider the case where the growth rate is 10%, the number of years is 10, and the tax rate is 20%. As a result, the arbitrary holding period is converted to a 10 year holding period in the following:

$$x_{10} = x_0 * (1.1^{10} - 20\% * (1.1^{10} - 1))$$
$$= x_0 * (2.59 - 20\% * (2.59 - 1))$$
$$= x_0 * (2.59 - 20\% * (1.59))$$
$$= x_0 * (2.59 - 0.32)$$
$$= x_0 * (2.27)$$

In contrast, the formula for a one year holding period, for 10 years (where the portfolio is sold and repurchased each year for the 10 years), assuming the same growth and tax rate, is given by:

$$x_{10} = x_0 * (1.1 - 20\% * (1.1 - 1))^{10}$$
$$= x_0 * (1.1 - 20\% * (0.1))^{10}$$
$$= x_0 * (1.08)^{10}$$
$$= x_0 * (2.16)$$

Thus, we can see that the multiplier on the initial value is decreased by 0.11 due to the effect of taxes prior to application of the exponent.

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