**Hurdle Rate For Active Management**
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How good must an active manager be in order to outperform a passive investment over time? This is the question we attempt to answer below. Many think an active manager need only outperform a passive benchmark by the amount of their fees and trading costs. While this alone presents too high a hurdle for most managers, there is an additional hurdle for taxable investors. The impact of taxes and the timing of when they are paid (i.e. deferral) have an even greater drag on net results. From our experience, after accounting for fees and taxes, most active investment strategies generate poor returns in comparison to passive options, and the returns they do generate generally come with greater risks.

Understanding the impact of costs and taxes on an investment is not a complicated proposition but, in our experience, one that few investors take the time to analyze. Some investments are simpler to analyze than others. For example, buying and holding a tax-free municipal bond until maturity may not involve any costs or taxes over the life of the bond, and hence a bond that yields 4% at purchase will provide that same net return over its life. Conversely, some investments are more complicated to analyze given complex fee structures and tax treatment. A hedge fund investment typically involves management and performance fees paid to the advisor, higher taxes on returns, and the significant transaction costs of trading (which can include actual trading costs as well as operational costs). After accounting for all of these, the net return to the investor may no longer be worth the promised (but far from guaranteed) return. We look at an example below to establish a framework for comparing different types of investments.

**Comparing After Tax Returns of Passive versus Active Management**

It is well known that few active managers outperform a comparable passive benchmark over time, even *before* the impact of taxes. Below we establish a return hurdle that an active manager would need to exceed, in order to beat passively holding a diversified basket of stocks, after accounting *only* for the incremental tax costs.

First, we start with the net return for a passive US stock investor. From Jan 1970 to Dec 2012, US stocks returned 9.63%[1]. Whether we bought and held a representative basket of US stocks or bought and held an index fund, one would have earned roughly this return and assumed about the same amount of risk in either case. Of this return, 6.26% was from capital gains and 3.37% from dividends. Importantly, since capital gains and dividends taxes can be incurred at different times, we need to incorporate these differences when simulating how they would have reduced the gross index return.

To assess the impact of taxes, we simulated a hypothetical $1 million investment made in Jan 1970 and held through Dec 2012, applying the Federal tax rates listed. These tax rates represent current top rates and are lower than the average rate over the time period simulated.

| | |
|---|---|
| ***Dividend Tax Rate*** | *23.8%* |
| ***Long-term Capital Gains Rate*** | *23.8%* |

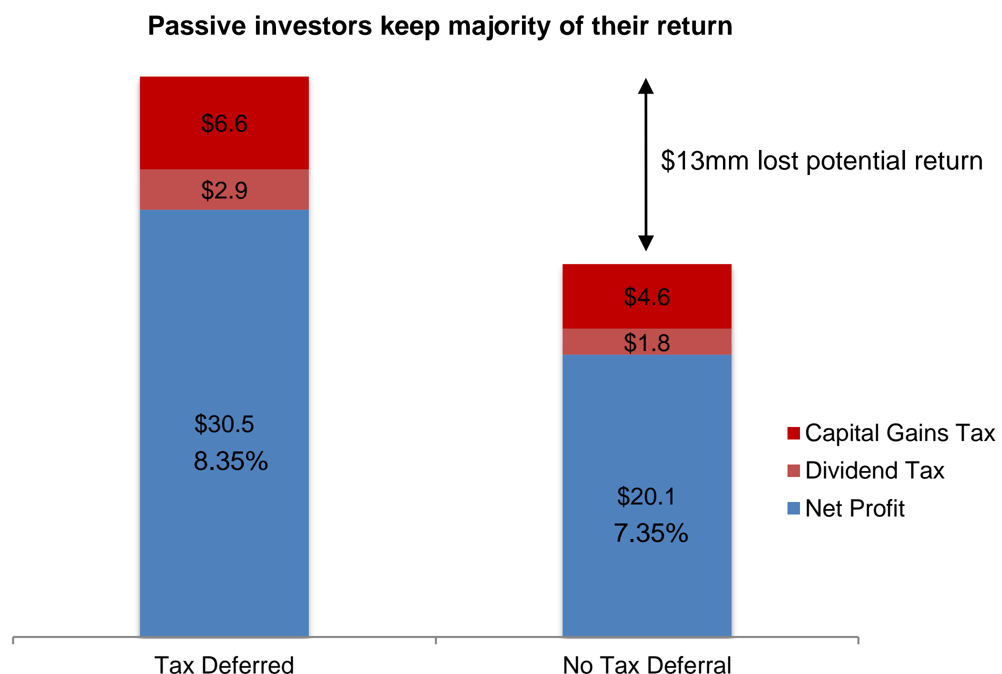
[1] As represented by the MSCI USA equity index

We deducted dividend taxes on December 31st of each year. The dividend remaining net of taxes was then reinvested back into the diversified basket of stocks. No sales were made until the end of the 43 year period, on December 31, 2012, at which point all capital gains were realized and taxed accordingly.

The figure below illustrates the degree to which gross returns were reduced by taxes, for both the passive and active investor. After 43 years, the original $1 million dollar investment would have generated more than $30 million in net profits for the passive investor - an annualized "take home" return of 8.35%, with only 18% of the potential return lost to taxes.

In comparison, an active manager who turned over their portfolio once per year (which is in line with mutual funds averages) would have triggered regular realized gains, resulting in destructive outflows which severely retard the power of compounding over time. By not deferring taxes, ***net profits to the investor were reduced by 1/3 or over $10 million.***

**Passive investors keep majority of their return**




*Source MSCI, Barclays*

From the above we can begin to derive a long term return hurdle that an active manager must clear to outperform a passive investment. Backing into the hurdle using the same simulation, **the active manager would have needed to produce a pre-tax return of 11% to earn the same $30 million in net of tax profits as the passive investment.** This is a monumental hurdle considering that we have yet to include fees, and we know that most active managers fail to outperform by more than the fees they charge. The above assumes the active manager only incurs federal taxes at long-term rates. If instead we assumed the effective tax rate for the active manager was 30% because they incur some short-term capital gains, then the return hurdle rises to almost 12%.

It is important to note that achieving this passive return did not involve taking undue risk. The only "bet" involved was on capitalism, namely that businesses, in general, would continue to earn a positive return. One would have purchased a basket of stocks and held them at a custodian. Since there was no use of

leverage or derivatives there was no risk of ruin[2], or risk that a manager underperforms the index or their peers (alpha risk).

The fact that holding (rather than trading) stocks allows deferral of capital gains taxes (in effect, an interest free loan from the US Treasury) gives passive investing a significant advantage. There are many studies that show the harmful costs of fees on active management performance, but most miss the fact that the increased tax burden from active strategies has an even greater negative impact.

**Passive Investing's Margin of Safety is Expanded Through Lower Fees**

Now we incorporate the impact of fees, as well as taxes, to derive a more realistic return hurdle that active managers would need to surpass, in order to outperform a passive investment. Since many investors are curious about hedge funds and whether they can be expected to provide adequate returns, we look at the tax and fee drag for both traditional active managers and hedge funds.

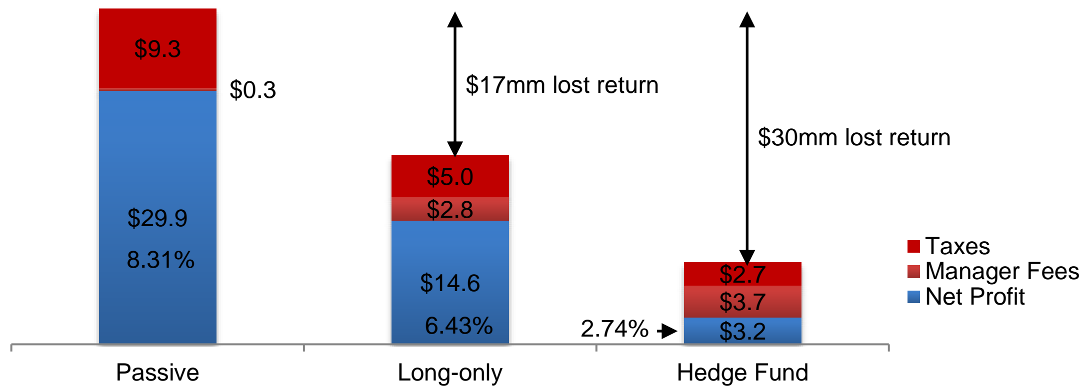
For the passive investment we assume the fee level of an index fund, as well as incurring dividends and capital gains taxes at the same rates as above. For a traditional, long-only active manager, we assume a fee of 1% and that all capital gains incurred are long-term and incurred annually. Finally, for hedge funds, we applied the fee structure that is typical to hedge funds, a fixed management fee and profit participation fee. Additionally, since most hedge funds actively trade and therefore do not defer gains, we applied current short-term gains tax rates. For some hedge fund strategies it may be more realistic to apply a blended long-term and short-term capital gains rate since they will defer a portion of their gains from time to time. Our goal is to build a framework that can be applied to specific situations and illustrate just how large the impact of taxes can be, hence are using the simplifying assumption of all hedge fund gains being taxed at short-term rates.

| | Passive | Long-only Active | Hedge Fund |
|---|---|---|---|
| ***Management Fee*** | *0.05%* | *1.0%* | *2.0%* |
| ***Performance Fee*** | *n/a* | *n/a* | *20% of profits* |
| ***Capital Gains Rate*** | *23.8%* | *23.8%* | *43.4%* |

The figure below illustrates the net return to the investor and the sum of all fees and taxes that would have been paid over the 43 year period studied. These results are based on the assumption that all three styles of investment earn the same 9.63% return before fees and taxes (which is a reasonable starting point since active trading, in aggregate, is a zero sum activity). The difference in net profits to an investor between a passive investment and either active management style is breathtaking. **The passive investment produces more than double the take home return compared to a traditional active manager, and almost 10 times that of the hedge fund!** Additionally, over this same period, buying and holding a portfolio of high quality, tax-free municipal bonds would have yielded 6.73%[3], besting the active stock manager with much less risk.

[2] "Risk of ruin" is a gambling concept relating to the likelihood of losing all of one's capital. There is a real risk of ruin in any trading strategy that uses leverage as it is possible to lose more money than you have. We believe a more practical way to think about risk of ruin is the risk of a large enough drawdown that makes it difficult for a manager to recover and hence incentivizing them to close their firm and return client capital. This type of scenario is more likely and dramatically impacts an investor's likelihood of success.

[3] Based on return of Barclays Non-Taxable Municipal Bond Index from January 1980 to June 2013. From Jan 1970 – Dec 1979, municipal yields from the Bond Buyer G.O. 20 Municipal Bond Index are converted into total returns, assuming average maturity of 10 years.




*Source MSCI, Barclays*

**The hedge fund investor would have lost significant purchasing power, lagging the 4.4% rate of inflation during this period, while the passive investor would have multiplied their purchasing power six-fold.** These are meaningful differences that impact the lives of those in our care. This chasm may partially explain why many managers choose to dismiss the impact of taxes as complex and therefore not worthy of attention. However, this margin of difference between a tax efficient portfolio and an active one, is so large that precision is not necessary. Importantly, since active management is a zero sum game, the best starting point for establishing the relative return hurdle rates for each style is to assume that the traditional active manager and hedge fund earn the same gross return as the passive index.

**How good do active managers need to be?**

As we did in the first example, we can calculate the gross return that an active manager (traditional and hedge fund) would have needed in order to deliver the same $30 million in net profits as the passive investment in stocks. When simulating the same 43 year period for the long-only and hedge fund managers, using the fee levels described above, the return hurdles appear insurmountable. The traditional active manager would have needed to earn more than 12% before fees and taxes to outperform a passive investment. And the hedge fund ***would have needed to generate almost 21% before fees and taxes to merely equal holding stocks***. Of the $75 million in profits that such an exceptional hedge fund manager would have generated, the manager and federal government each would have taken over 30% of the total return, thereby reducing the investor's return by more than 60%, down to the same 8.31% as a passive investment in US stocks.

One could also approximate the hurdle rate without simulation, using simple mathematics. The difference between the table below (showing the calculation only for hedge funds) and the more accurate simulation method above is the impact of compound returns and it gives an indication of the hurdle over even short periods of time.

| | |
|---|---:|
| *Gross Return* | *21.0%* |
| *- Management Fee* | *2.0%* |
| *= Return Net of Mgmt Fee* | *19.0%* |
| *- Performance Fee (20% x Return)* | *3.8%* |
| *= Return Net of Performance Fee* | *15.2%* |
| *- Taxes (Rate @ 43.4%)* | *6.6%* |
| *= Net Return to Investor* | ***8.6%*** |

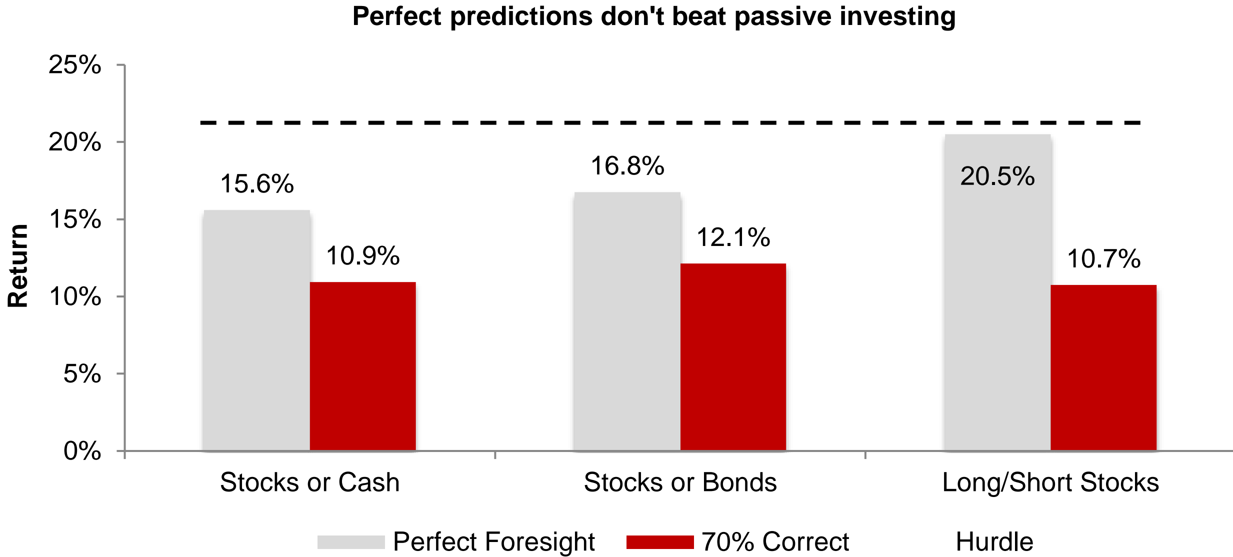
Both calculation methods show that taxes take an even greater share of returns than high active management fees. While this is a reasonable estimation on a forward basis, it is worth noting that the actual hurdle would have been even higher, as average tax rates over this historical period were higher than the modeled current rates.

**Perfect foresight would not overcome this hurdle**

How high are these active management hurdles? How much skill would be required to overcome them? To put them into perspective, we simulated how a trader timing markets with perfect foresight might have performed. While no one can predict the future, this hypothetical example allows us to see just how difficult it is to outperform a passive investment. At the start of each year, this trader knows whether stocks will be up or down for the year, and is correct 100% of the time. The trader then chooses whether to invest in stocks or another, more attractive alternative. We ran three separate simulations as to his alternative investment. Each simulation increases the difficulty of prediction, and therefore the riskiness of the proposed scenario.

> Simulation 1: The trader has the choice of stocks or cash. If he knows stocks will outperform cash, then he invests in stocks. If not, then he holds all of his money in cash. Said another way, he never experiences a losing year in the stock market, earning the best return between stocks and Treasury bills every year. A truly Herculean forecaster.
>
> Simulation 2: The trader has the choice between stocks or Treasury bonds. If he knows stocks will outperform bonds, then he invests in stocks. Otherwise he invests in bonds. Now the trader not only has to be able to predict whether stocks will be up, but also whether stocks will be better than bonds.
>
> Simulation 3: The trader will be 100% long or 100% short stocks for the year based upon his perfect knowledge of the future. If he knows stocks will outperform cash then he fully invests. If he knows stocks will underperform cash, he sells stocks short. This is an extremely risky strategy, but we will assume he has short and long term clairvoyance beyond what logic or experience would suggest is possible.

The results for each of these simulations are shown below. Compared to buying and holding the index, it is no surprise that knowing exactly when stocks will be up and when they will be down helps gross returns dramatically. But one can also see that ***none of these simulations outperforms the 21% return that a hedge fund would need to match a passive index fund net of fees and taxes***. From our experience, even the best active managers are right less than 70% of the time. For the sake of comparison, we also simulated the result (using 100 Monte Carlo trials) of a manager who could correctly time markets 70% of the time. This manager is at best only able to equal the return hurdle required of a traditional active manager. Remember these simulation results are shown before the impact of any fees, trading costs, or taxes.




*Source: MSCI, Barclays.* The return hurdle shown is for a hedge fund investment.

Taxes clearly present the biggest obstacle for active management to outperform a passive investing. To more clearly see only the tax impact, we ran the same simulations assuming the trader was altruistic (in addition to being clairvoyant), and measured the results on an after-tax basis. That is, *we assumed this trader did not charge any fees or incur any costs for managing your money.* The next table shows the comparison between the after-tax results of a passive stock index fund compared to our 3 simulations. Even with perfect foresight, this trader would only modestly outperform a passive index fund. Needless to say, the exceptional (yet not perfect) trader who was right ”only” 70% of the time would not even be close to a passive investment on an after-tax basis. Remember that our simulated portfolios assume no fees or costs of any kind, which is of course unrealistic, especially with an active trading strategy like the one described.

| **After-Tax Return** (ignoring fees) | **Perfect Foresight** |
|---|---|
| US Stocks (Buy and Hold) | 8.3% |
| Simulation 1: Stocks or Cash | 9.6% |
| Simulation 2: Stocks or Bonds | 10.2% |
| Simulation 3: Long/Short Stocks | 12.1% |

*Source MSCI, Barclays.*

We can see why almost no manager has ever delivered a result above our derived hurdle rate over long periods of time. Doing so would require an ability to foresee the future that is not worth betting on.

**Returns to Investor Not Commensurate with Risk Taken in Active Trading**

It is clear that the hurdle for beating a passive investment is high, especially when taxes are involved. However, our analysis is not complete until we take risk into consideration. Chasing the highest return at any level of risk has never made anyone rich (other than the rare lottery winner). Rather, taking calculated risks that offer commensurate opportunity for profit, is the secret to success.

Risk is the possibility of losing money, or not meeting your goals. While risk is not easily quantified, compiling a list of major risks for an investment is often enough to help compare one investment to another. There are many risks with active trading strategies, one of the biggest of which is that

competition will erode a manager's edge, reducing it to zero over time. Also, typically required to target such high returns is the use of leverage. Leverage introduces the risk of ruin and therefore the risk of losing all of your capital. In comparison, buying and holding a diversified portfolio of stocks (or bonds) doesn't include any of those risks. It only comes with the same risk as all assets, namely that capitalism stops working and providing a return over time for owning risky assets.

Once the risks of such active strategies are compared to the low risk proposition of a buy and hold investment (in stocks or bonds) it becomes even clearer that the risk to going active is extremely high. Understanding such risks with active management and knowing what the hurdle rate is can help us all make more informed investment decisions. Understanding how high the return hurdle is involves thinking longer term, over multi-year periods, to get a sense for the impact of compounding on your net results.

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**NOTE:** Tax rates used are US Federal rates, including Medicare surtax, as of Jan 1, 2013. Passive stock investment fees based on Vanguard Total Stock Market index fund admiral share class (ticker: VTSAX).

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