Portfolio Implications of Triple Net Returns

Peter Mladina

Peter Mladina
is the director of research at Waterline Partners in Los Angeles, CA.

The majority of research on portfolio construction ignores the significant impact of expenses and taxes. In the real world, taxable investors can only consume their existing wealth plus the compounding of that invested wealth after all expenses, taxes, and inflation (triple net returns). In other words, taxable investors consume triple net returns. In this article, we investigate portfolio construction from the practical perspective of triple net returns.

We develop a methodology to estimate forward-looking expected returns for seven major publicly traded asset classes: taxable bonds (Barclays U.S. Aggregate Bond Index), municipal bonds (Barclays 7-Year Municipal Bond Index), U.S. equities (Russell 3000), non-U.S. equities (MSCI World ex-US), hedge funds (Hedge Fund Research Fund Weighted Composite), commodities (S&P Goldman Sachs Commodity Index), and real estate (FTSE NAREIT Equity REITs). Expected gross return estimates are based on long-term capital market histories and/or forward-looking, market-based factors. We then reduce expected gross return by the amount of expenses to arrive at expected return net of expense. We further reduce the expected return net of expense by the negative impact of tax. And finally, we subtract out inflation to arrive at expected return net of expense, tax, and inflation—or triple net returns.

From our triple net return perspective, we compare the various asset classes as if they were managed both actively and passively to gauge the minimum amount of gross alpha an active manager must earn to claw back all additional expenses and taxes to achieve a breakeven triple net return relative to a live, passive fund alternative. We call this triple-net-alpha. We judge whether an active or passive strategy is the best approach for the asset class given the size of the triple-net-alpha hurdle.

Finally, we investigate through unconstrained mean–variance-optimization which asset classes are worth inclusion in taxable portfolios across the risk spectrum. Inputs into the mean–variance-optimization include the expected triple net returns and the necessary adjustments to standard deviation and correlation, if any. The main objective is not necessarily to suggest optimal asset class weightings in a portfolio but to investigate the more practical question of whether certain asset classes ought to be excluded entirely from taxable portfolios. Our findings suggest that taxable investors should own primarily low-cost, passively or semi-passively managed equities and municipal bonds.[1] We find similar results for tax-exempt investors when considering double net returns (after all expenses and inflation).

TRIPLE NET RETURNS

Fixed Income

We assume the expected gross return for taxable bonds is the yield to maturity for the benchmark Barclays U.S. Aggregate Bond Index. Similarly, we assume the expected gross return for municipal bonds is the yield to maturity for the Barclays 7-Year Municipal Bond Index (which offers a similar maturity as the Barclays Aggregate). Since the yield to maturity is a market-based return estimate, it is arguably the best guess for expected gross return over the maturity horizon of investment-grade bonds.[2] This article uses the 2009 year-end yield to maturities of 3.68% and 3.09% for the Barclays U.S. Aggregate Bond Index and the Barclays 7-Year Municipal Bond Index, respectively.[3]

We then subtract an estimated expense ratio from the expected gross return to arrive at expected return net of expense.[4] For the actively managed scenario, we use the average expense ratios from the Morningstar mutual fund database for taxable bond funds (1.03%) and tax-exempt bond funds (1.00%). For the passively managed scenario, we use Vanguard's expense ratios for the Admiral Shares of its Total Bond Index (0.14%) and Intermediate-Term Tax-Exempt fund (0.12%). In addition to the expense ratio, transaction costs should be considered. But for bond managers (unlike equity managers), there is little evidence that turnover hurts performance, so we do not include transaction costs for fixed income (Lee [2009]).

Investors are taxed on their return net of expense, as fund expenses generally offset taxable income distributions. Therefore, next we subtract the estimated tax from the expected return net of expense to arrive at expected return net of expense and tax. Since our expected gross return is based on the yield to maturity, we do not include capital gains taxes. The income tax rate we assume is 35%, which is the highest marginal federal rate at the beginning of 2010. Many high-net-worth investors are in or near the highest tax bracket based on their marginal income. For simplicity, we exclude state tax in our analysis, as it differs from state to state.[5] Therefore, we subtract the 35% tax from expected return net of expenses to arrive at expected return net of expense and tax for taxable bonds. We do not make this tax adjustment to municipal bond returns because they are not generally exposed to federal taxation of interest.

The final step is to subtract inflation from expected return net of expense and tax to arrive at expected return net of expense, tax, and inflation—or our triple net return for fixed income. Inflation is the last adjustment because investors pay taxes and fees on nominal returns. Our market-based forecast for inflation is the difference between the 10-year Treasury bond yield and the 10-year inflation protected Treasury bond yield at the end of 2009, which is 2.37%. Exhibit 1 illustrates expected triple net returns for fixed income.

We now introduce the concept of triple-net-alpha. This is the amount of gross alpha that an active manager must earn to claw back all additional expenses and taxes to achieve a breakeven triple net return relative to a live, passive fund alternative. In other words, it is the difference between active and passive gross expected returns that equalizes triple net return. The risk benchmark is not defined as an index or risk factor model, but the investable, passive fund alternative (the real-world opportunity cost).

Exhibit 2 shows triple-net-alpha hurdles for fixed income. For taxable bonds, the amount of triple-net-alpha required to break even with passive management is 89 basis points. Active municipal bond managers require 88 bps of triple-net-alpha. These meaningful alpha

EXHIBIT 1
Expected Triple Net Returns for Fixed Income

	Taxable Bonds Active	Taxable Bonds Passive	Municipal Bonds Active	Municipal Bonds Passive
Gross expected return	3.68%	3.68%	3.09%	3.09%
Expenses	–1.03%	–0.14%	–1.00%	–0.12%
Tax	–0.93%	–1.24%	0.00%	0.00%
Inflation	–2.37%	–2.37%	–2.37%	–2.37%
Expected Triple Net Return	–0.65%	–0.07%	–0.28%	0.60%

EXHIBIT 2
Triple-Net-Alpha Hurdles for Fixed Income

	Taxable Bonds Active	Taxable Bonds Passive	Municipal Bonds Active	Municipal Bonds Passive
Expected return	3.68%	3.68%	3.09%	3.09%
Required triple-net-alpha	0.89%	0.00%	0.88%	0.00%
Gross expected return	4.57%	3.68%	3.97%	3.09%
Expenses	–1.03%	–0.14%	–1.00%	–0.12%
Tax	–1.24%	–1.24%	0.00%	0.00%
Inflation	–2.37%	–2.37%	–2.37%	–2.37%
Expected Triple Net Return	–0.07%	–0.07%	0.60%	0.60%

hurdles argue for low-cost, passive or semi-passive management of both taxable and tax-exempt fixed income.

Equity-Oriented Assets

We assume the expected gross return for all equity-oriented assets is the historic globally weighted long-term real equity return of 5.4% plus the TIPs-implied breakeven inflation forecast of 2.37%, equaling 7.77% (Dimson et al. [2010]). Unlike fixed income, equity-oriented assets do not have known future cash flows to help price a yield to maturity—and therefore an expected return. Instead, the longest and broadest history of real compound equity returns arguably provides a good guide to future real equity returns.

We then subtract the estimated expense ratio and trading costs from the expected gross return to arrive at expected return net of expense for equity-oriented assets.[6] For actively managed U.S. equities and REITs, we use the average expense ratio that we obtained from the Morningstar database for U.S. equity mutual funds (1.35%). For actively managed non-U.S. equities, we use the average expense ratio in the Morningstar database for international equity mutual funds (1.55%). For passively managed U.S. and non-U.S. equities, we use the expense ratios of Vanguard's Total Stock Market Index Admiral Shares (0.09%) and Total International Stock Index (0.34%), respectively. For passively managed REITs, we use the expense ratio of Vanguard's Admiral Share REIT Index fund (0.15%). We assume the traditional 2/20 fee structure for hedge funds, thereby reducing the expected gross return by the 2% fee and the remaining expected gross return by the 20% carried interest. (This study intentionally gives hedge funds the benefit of doubt by starting with the conventional view that hedge funds offer equity-like gross returns, bond-like standard deviations, and low correlations with other asset classes).

In addition to the expense ratio, transaction costs must be considered. These costs include commissions and market impact, with market impact being the larger contributor. Higher turnover generates higher transaction costs. Carhart [1997] found average round trip trading costs of 0.95%. Elkins McSherry and Zeno Consulting (two trade cost consultants) estimate the average U.S. trading implementation shortfall (a one-way trade cost metric) of 0.53% and 0.60%, respectively, near the end of 2009, which equal 1.06% and 1.20% average round trip trading costs, respectively. This article uses the 0.95% Carhart estimate, as it is the most conservative. We multiply 0.95% by portfolio turnover to arrive at our estimate for trading costs. We assume 94% turnover for active U.S. equity and 90% for active non-U.S. equity, which are the respective average turnover ratios in the Morningstar mutual fund database. We utilize the turnover ratios in the Vanguard funds for the passive equity strategies (5% for U.S. equity, 12% for non-U.S. equity, and 10% for REITs). And we conservatively assume 100% turnover for hedge funds, although it is generally higher. Our trading cost estimates are subtracted from expected gross return, along with the expense ratios highlighted above, to arrive at expected return net of expense for equity-oriented assets.

Investors are taxed on their return net of expense, as fund expenses generally offset taxable income distributions. Therefore, we next subtract estimated total tax from expected return net of expense to arrive at expected return net of expense and tax for equity-oriented investments. Total tax includes unqualified dividend income tax, qualified dividend income tax, short-term capital

gains tax, and long-term capital gains tax. For U.S. equities, non-U.S. equities, and hedge funds, we estimate the qualified dividend income tax by taxing the prevailing market dividend yield at the 15% qualified federal dividend tax rate at the beginning of 2010. And for simplicity, we again assume no state tax as it differs from state to state. Since REITs generate unqualified dividend income, we assume these dividends are taxed at the highest marginal federal tax rate of 35%, just like taxable bonds.

The remaining return (i.e., return net of expense less dividends) is exposed to short-term and long-term capital gains tax. We assume capital gains tax rates of 35% for realized short-term gains (highest marginal federal rate) and 15% for realized long-term gains. We must differentiate internally generated short- and long-term capital gains tax due to annual fund turnover from terminal capital gains tax due to the investor's future, final liquidation of an appreciated asset for consumption or reallocation. For internally generated gains, our methodology reasonably assumes that the split between short-term and long-term capital gains depends largely on the magnitude of annual turnover. For example, if a fund has 80% annual turnover, we assume that 80% of the remaining return (return net of expense less dividends) would be exposed to capital gains tax annually—with 80% of the 80% of remaining return taxed at the short-term rate and 20% of the 80% of remaining return taxed at the long-term rate. If, on the other hand, the fund has a low 10% annual turnover, we assume that 10% of the remaining return (return net of expense less dividends) would be exposed to capital gains tax annually—with 10% of the 10% of remaining return taxed at the short-term rate and 90% of the 10% of remaining return taxed at the long-term rate. This approach to estimating annual, internally generated capital gains tax is able to dynamically apportion tax treatment (long-term gains vs. short-term gains) based on annual turnover, where higher turnover funds are proportionally more exposed to short-term capital gains than lower turnover funds.

The final tax to consider is the terminal capital gains tax, which is generally higher for low-turnover strategies that realize few capital gains year to year. For simplicity, this article assumes a 10-year terminal capital gains horizon for equity-oriented assets.[7] The methodology takes a base present value and compounds it by the remaining terminal return (i.e., return net of expense less dividends and ongoing realized capital gains) to a future value in 10 years, taxes the gain portion of the future value at the long-term rate of 15%, then solves for the rate of return that discounts the after-tax future value to the base present value. The difference in the two rates is the compound annualized estimate of the terminal capital gains tax.

The final step is to subtract the 2.37% TIPS-implied breakeven inflation from expected return net of expense and tax to arrive at expected return net of expense, tax, and inflation, or our triple net return for equity-oriented assets. Exhibit 3 illustrates expected triple net returns for equity-oriented assets.

We next look at triple-net-alpha hurdles for equity-oriented assets, as demonstrated in Exhibit 4. For U.S. equities the amount of triple-net-alpha necessary for an active manager to claw back all additional expenses and taxes to achieve a breakeven triple net return relative to the passive alternative is 380 bps. For non-U.S. equities the triple-net-alpha hurdle is 325 bps, and for REITs it is 308 bps. Incredibly, hedge funds require triple-net-alpha of 740 bps to claw back all foregone expenses, taxes, and inflation and breakeven with a passive U.S. equity alternative. These large alpha hurdles argue for low-cost, passive or semi-passive management of equity-oriented assets.

EXHIBIT 3
Expected Triple Net Returns for Equity-Oriented Assets

	U.S. Equities Active	U.S. Equities Passive	Non-U.S. Equities Active	Non-U.S. Equities Passive	REITs Active	REITs Passive	Hedge Funds Active
Gross expected return	7.77%	7.77%	7.77%	7.77%	7.77%	7.77%	7.77%
Expense ratio	–1.35%	–0.09%	–1.55%	–0.34%	–1.35%	–0.15%	–3.15%
Transaction costs	–0.89%	–0.05%	–0.86%	–0.11%	–0.89%	–0.10%	–0.95%
Tax	–1.45%	–1.01%	–1.30%	–1.01%	–1.89%	–1.82%	–0.88%
Inflation	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%
Expected Triple Net Return	1.70%	4.26%	1.69%	3.93%	1.26%	3.34%	0.41%

EXHIBIT 4
Triple-Net-Alpha Hurdles for Equity-Oriented Assets

	U.S. Equities Active	U.S. Equities Passive	Non-U.S. Equities Active	Non-U.S. Equities Passive	REITs Active	REITs Passive	Hedge Funds Active
Expected return	7.77%	7.77%	7.77%	7.77%	7.77%	7.77%	7.77%
Required triple-net-alpha	3.80%	0.00%	3.25%	0.00%	3.08%	0.00%	7.40%
Gross expected return	11.57%	7.77%	11.02%	7.77%	10.85%	7.77%	15.17%
Expense ratio	–1.35%	–0.09%	–1.55%	–0.34%	–1.35%	–0.15%	–4.63%
Transaction costs	–0.89%	–0.05%	–0.86%	–0.11%	–0.89%	–0.10%	–0.95%
Tax	–2.69%	–1.01%	–2.31%	–1.01%	–2.90%	–1.82%	–2.96%
Inflation	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%
Expected Triple Net Return	4.26%	4.26%	3.93%	3.93%	3.34%	3.34%	4.26%

Commodities

We treat commodities separately because they have different return drivers than equity-oriented assets. In practice, a portfolio's exposure to commodities is generally achieved through the purchase and roll of long commodity futures contracts, which is basically a passive strategy. Active management of commodity futures is more typically based on capturing a momentum premium, which often requires going short. Momentum factors and short exposures are different from the underlying long commodity exposures that most investors typically seek for the total portfolio, so we do not consider actively managed commodity futures in this study.

Investors in futures contracts must post collateral to take a position. Therefore, the first driver of expected gross return is the interest earned on a fully collateralized position, which is typically based on Treasury bill yields. However, Treasury bill yields at the end of 2009 (just 0.08%) reflect an extraordinary effort by the Federal Reserve to keep short-term rates low. So these yields are likely to be short-lived and not representative of longer-term expected collateral yield. In general, one should expect the collateral interest at least to cover inflation in most years, as Treasury bills typically do. Therefore, for the purpose of creating an expected gross return for commodity futures, we assume a collateral yield equal to TIPS-implied breakeven inflation of 2.37%—though we would use the Treasury bill yield in a more normal environment.

The second driver of expected gross return is the annualized roll yield. It is positive (backwardation) when futures prices are lower than spot prices, offering the commodity futures investor an opportunity to profit as time passes and the futures price rises to the spot price. The roll yield is negative (contango) when futures prices are higher than spot prices. Over the long run, a basket of commodities (spot prices) should roughly pace with inflation, almost by definition.[8] This suggests that over the long run, the natural term structure of commodity futures prices is probably contango, as it generally stood at the end of 2009. Therefore, we assume no roll yield in the expected gross return.

The final driver of expected gross return is spot appreciation above what is anticipated in the futures price. If futures markets are competitive, then on average the spot appreciation should be captured by the term structure of futures prices. In other words, commodity futures investors should not benefit from spot price appreciation over the long run because they own the futures price (not the spot price), and the futures price already reflects expected appreciation of spot prices. This implies that the commodity futures investor may be more likely to benefit from spot appreciation when there is persistent backwardation in the term structure.

Therefore, we construct an expected gross return for long commodity futures by summing our 2.37% collateral interest, 0.00% roll yield, and 0.00% spot appreciation. It is worth pointing out that the expected gross return for commodity futures is equal to inflation, but collateral yield drives this return, not spot appreciation. The expected gross return is reduced by an expense ratio of –0.75% (expense ratio of the iShares S&P GSCI exchange-traded fund) to arrive at a 1.62% expected return net of expense. Commodity futures are taxed according to Section 1256 of the IRS code, which requires 60% long-term capital gains tax treatment and 40% short-term capital gains tax treatment. However, our expected return is driven by collateral yield, which is taxed as ordinary income. If we apply the 35% income

tax rate to the 1.62% expected return net of expense, we achieve an expected return net of expense and tax of 1.05%. And when we subtract out inflation, we have an expected return net of expense, tax, and inflation of –1.32%, which is our expected triple net return for long commodity futures. This should not be surprising since derivatives are engineered to be zero-sum games. Furthermore, historic commodity futures returns could be misleading to the forward-looking investor because they were largely driven by backwardation and higher collateral yields, which are not present today (Erb and Harvey [2006]).[9]

Although we do not directly address actively managed commodities futures in this article, it is plain to see that the triple-net-alpha required for an active commodity futures manager to achieve an equity-like triple net return is very large. Many investors argue that commodity futures are powerful diversifiers, but negative expected triple net returns with high variances are unlikely to deserve an allocation of capital despite their correlation features, which we investigate in the next section.

MEAN–VARIANCE-OPTIMIZATION OF TRIPLE NET RETURNS

We next look at the triple net returns of various asset classes from the total portfolio perspective. We investigate through unconstrained mean–variance-optimization (MVO) of triple net returns which asset classes are worth inclusion in taxable portfolios across the risk spectrum. Our objective is not to suggest optimal asset class weightings in a portfolio but to investigate the more practical question of whether certain asset classes and strategies ought to be excluded entirely from taxable portfolios. Our triple-net-alpha values from the previous section argue strongly for passive management when possible, but they did not address whether the correlation and standard deviation features of the asset classes—hedge funds and commodities in particular—offer benefits as diversifiers despite their low triple net returns.

We begin by conceding certain shortcomings with MVO. Input sensitivity and error magnification can lead to unintuitive portfolios. This is why we limit our MVO objective to investigating the potential exclusion of certain asset classes instead of suggesting specific asset class weightings. We further address MVO shortcomings by recognizing that historic correlations and standard deviations are more stable than historic returns. This is why we constructed our gross expected returns in the previous section with forward-looking market-based information, where available, and synthesized the longest and broadest capital market history when forward-looking market-based information is not possible. Since historic correlations and standard deviations have been more stable than historic returns, we are comfortable using these two inputs prospectively with some necessary tax adjustments to the standard deviation.[10]

We must adjust the shape and position of the return distribution so the MVO inputs reflect all expenses, taxes, and inflation. Expenses and inflation merely shift the return distribution to the left with a lower mean but the same standard deviation. The standard deviation remains the same because, regardless of whether any single return selected from the distribution is positive or negative, expenses and inflation reduce it one-for-one.

Taxes also move the distribution partially to the left with a lower mean. However, taxes create a skewed distribution because the right tail of the distribution shifts to the left but the left tail does not shift. This is because investors are taxed on gains but not on losses.[11] Since it is the downside (left half of the distribution) we consider most when we think about standard deviation as a risk metric, we adjust the standard deviation for tax but not for expenses and inflation. We do this by multiplying the standard deviation by (1 – tax), where tax is the total tax rate as a percentage of the gross return (Horan [2007] and Reichenstein [2007]). We make no adjustments to historic correlations.

Our MVO inputs are the triple net returns, tax-adjusted standard deviations, and historic correlations for each asset class. Exhibit 5 illustrates the mix of asset classes along the efficient frontier, where position 0 is lowest risk/return, position 50 is middle risk/return, and position 100 is highest risk/return.

For the large majority of taxable investors, the unconstrained optimization argues for passively managed equities, REITs, and municipal bonds only—with passively managed taxable bonds appropriate for the most risk-averse investors. Commodities did not capture an allocation anywhere along the efficient frontier, and hedge fund exposure is limited to only the most risk-averse portfolios (positions 0–4). But it is important to point out that although the optimization includes hedge funds in the most risk-averse portfolios, it does not

EXHIBIT 5
Portfolio Optimization of Triple Net Returns

	Position 0 Lowest Risk/Return	Position 25	Position 50 Middle Risk/Return	Position 75	Position 100 Highest Risk/Return
Taxable Bonds	90%	0%	0%	0%	0%
Municipal Bonds	0%	67%	40%	17%	0%
U.S. Equities	0%	24%	44%	62%	100%
Non-U.S. Equities	0%	6%	10%	12%	0%
Hedge Funds	10%	0%	0%	0%	0%
Commodities	0%	0%	0%	0%	0%
Real Estate	0%	3%	6%	9%	0%
Total	100%	100%	100%	100%	100%

EXHIBIT 6
Double-Net-Alpha Hurdles

	Taxable Bonds Active	Taxable Bonds Passive	Municipal Bonds Active	Municipal Bonds Passive
Expected return	3.68%	3.68%	3.09%	3.09%
Required double-net-alpha	0.89%	0.00%	0.88%	0.00%
Gross expected return	4.57%	3.68%	3.97%	3.09%
Expenses	–1.03%	–0.14%	–1.00%	–0.12%
Tax	0.00%	0.00%	0.00%	0.00%
Inflation	–2.37%	–2.37%	–2.37%	–2.37%
Expected Double Net Return	1.17%	1.17%	0.60%	0.60%

	U.S. Equities Active	U.S. Equities Passive	Non-U.S. Equities Active	Non-U.S. Equities Passive	REITs Active	REITs Passive	Hedge Funds Active
Expected return	7.77%	7.77%	7.77%	7.77%	7.77%	7.77%	7.77%
Required double-net-alpha	2.10%	0.00%	1.95%	0.00%	2.00%	0.00%	4.95%
Gross expected return	9.87%	7.77%	9.72%	7.77%	9.77%	7.77%	12.72%
Expense ratio	–1.35%	–0.09%	–1.55%	–0.34%	–1.35%	–0.15%	–4.14%
Transaction costs	–0.89%	–0.05%	–0.86%	–0.11%	–0.89%	–0.10%	–0.95%
Tax	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Inflation	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%	–2.37%
Expected Double Net Return	5.26%	5.26%	4.95%	4.95%	5.16%	5.16%	5.26%

EXHIBIT 7
Portfolio Optimization of Double Net Returns

	Position 0 Lowest Risk/Return	Position 25	Position 50 Middle Risk/Return	Position 75	Position 100 Highest Risk/Return
Taxable Bonds	40%	63%	39%	17%	0%
Municipal Bonds	43%	0%	0%	0%	0%
U.S. Equities	0%	25%	41%	55%	100%
Non-U.S. Equities	0%	6%	10%	13%	0%
Hedge Funds	15%	0%	0%	0%	0%
Commodities	2%	0%	0%	0%	0%
Real Estate	0%	6%	10%	15%	0%
Total	100%	100%	100%	100%	100%

take into account the considerable idiosyncratic risks of hedge funds that make them inappropriate for the most risk-averse investors. These risks may include excessive leverage, concentration, illiquidity, lack of transparency, and the heightened risk of fraud. Furthermore, the validity of historic hedge fund returns remains an open question. We solved for expected returns separately, but backfill bias, survivorship bias, termination bias, and autocorrelations in the hedge fund dataset likely produce more-attractive standard deviation and correlation features than reality—especially over our 20-year MVO timeframe. From a triple net return perspective, commodities and hedge funds were not beneficial diversifiers despite their standard deviation and correlation features.

DOUBLE NET RETURNS—TAX-EXEMPT INVESTORS

Pension plans, endowments, and foundations are tax exempt. These institutional investors should view portfolio construction from the perspective of double net returns—after all expenses and inflation. To construct expected double net returns for each asset class, we merely added back tax to the expected triple net returns in Exhibits 1 and 3, and for commodity futures.[12] We see in Exhibit 6 that the double-net-alpha hurdles remain large in practice despite the elimination of taxation—arguing for low-cost, passive management of tax-exempt assets.[13]

For the unconstrained tax-exempt MVO, we used our expected double net returns and historic standard deviations and correlations. Because there is no tax to consider, we did not need to adjust the standard deviations. The tax-exempt results are essentially the same as our findings for taxable investors exposed to triple net returns, as illustrated in Exhibit 7. The only material difference is that taxable bonds replace municipal bonds for most portfolios, as would be expected. These findings suggest that tax-exempt investors should own primarily low-cost, passively or semi-passively managed equities, REITs, and taxable bonds.

CONCLUSIONS

In this article, we developed a methodology to estimate expected triple net returns for major asset classes. Although we highlighted a number of empirically supported assumptions throughout the article, this methodology can be applied to any set of reasonable assumptions.

We compared active and passive strategies by gauging the amount of triple-net-alpha required for an active manager to break even with a passive investment alternative. For all asset classes, the higher expenses and taxes generated by active management produced alpha hurdles too high to overcome persistently in practice—especially in light of the extensive literature on mutual fund performance.

We investigated through unconstrained mean–variance-optimization, adjusted for triple net returns, which asset classes offer diversification benefits due to their standard deviation and correlation features. From a triple net return perspective, hedge funds and commodities did not add value as diversifiers.

Our findings suggest that taxable investors should own primarily low-cost, passively or semi-passively managed equities, REITs, and municipal bonds. The results are similar for tax-exempt investors, with low-cost, passively managed taxable bonds replacing municipal bonds. The primary benefits of passive and semi-passive management are lower management fees and lower turnover (generating lower trading costs and lower taxes). The magnitude of these expenses is probably underappreciated by most investors, and lost in the noisy returns of the last 10 years.

ENDNOTES

[1]We define as semi-passive as any broadly diversified strategy with expense and turnover ratios similar to passive funds.

[2]We assume the default rate inside the investment-grade Barclays U.S. Aggregate and 7-Year Municipal Bond indices will not materially affect total return.

[3]Source: Ibbotson December 2009 yields.

[4]We would also subtract the investment consultant's fee, if any.

[5]Higher tax assumptions in the form of higher future federal taxes or the inclusion of state taxes reinforce our findings.

[6]We would also subtract the investment consultant's fee, if any.

[7]Twenty-year terminal tax horizons produce similar overall conclusions.

[8]Food and energy alone make up roughly a quarter of the Consumer Price Index.

[9]Although the historic excess return of the average individual commodity future has been close to zero, an equal-weighted commodity futures portfolio historically offered a diversification return premium, which we do not consider to be a confident source of future expected return.

[10]A 20-year MVO time frame (1990–2009) captures standard deviation and correlation inputs and is limited by the 1990 inception dates for the Hedge Fund Research Fund-Weighted Composite and Barclays 7-Year Municipal bond indices.

[11]For simplicity we ignore the tax deductibility of realized capital losses and loss carry-forwards against realized capital gains, as the timing and magnitude of these are highly uncertain.

[12]We make no adjustment for foreign dividend tax withholding, though this may be a material expense for tax-exempt investors with no avenue to claim a foreign tax credit.

[13]Busse, Goyal, and Wahal [2010] find average fees of 0.81% and turnover of 75% for domestic institutional equity products in 2008, which are lower than the Morningstar averages used in this article.

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