
When to Liquidate an ETF for an SMA?

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- Clients often ask us if they should sell an exchange-traded fund (ETF) at a gain and reinvest the proceeds into an SMA with tax-loss harvesting (TLH). To answer the question, we built a cash flow model that analyzes:
 - The tax cost of selling an ETF at a gain (this will depend on the cost basis)
 - The tax-loss harvesting benefit produced by the SMA
- Using internal rate of return (IRR) calculations, we compare the two approaches over 10 years, assuming investors have short- and long-term gains to offset over the period:
 - Status quo: keep ETF
 - Sell ETF and invest in SMA with TLH
- The difference in IRRs between the two approaches is the benefit of liquidating and loss harvesting.

*An Aperio separately managed account (SMA) with tax-loss harvesting.

Individualizing the Parameter Assumptions

The cash flow model allows the following parameters to be customized to each client's unique situation:

- Market Value of the ETF (or a basket of ETFs and/or mutual funds)
- Initial ETF Cost-Basis-to-Market-Value Ratio
- Client Long-Term and Short-Term Tax Rates
- Final Disposition: Estate/Donation (Non-Liquidation) vs. Liquidation
- ETF Fees and SMA Fees

Cash Flow Model: Sample Screenshot

Aperio's cash flow model* allows input parameters to be varied.

(for illustrative purposes)

Input Assumptions												
Short-Term Tax Rate	54.10%	California										
Long-Term Tax Rate	37.10%											
Initial Cost Basis of ETF	80%											
Liquidate or Estate/Donation at End?	0	0 = Estate/Donation, 1 = Liquidate										
Starting Portfolio Value (\$)	1,000,000											
ETF Fee	0.04%											
SMA Fee	0.35%											
Annual Growth Rate	7.00%											
		Parameter Assumptions										
Year→	0	1	2	3	4	5	6	7	8	9	10	Sum
ETF: No Tax-Loss Harvesting (\$)												
Pre-tax Starting Balance	1,000,000	1,000,000	1,069,600	1,144,044	1,223,670	1,308,837	1,399,932	1,497,367	1,601,584	1,713,054	1,832,283	
Cost Basis	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	800,000	
Ending Balance	1,000,000	1,069,600	1,144,044	1,223,670	1,308,837	1,399,932	1,497,367	1,601,584	1,713,054	1,832,283	1,959,810	
Losses Generated		0	0	0	0	0	0	0	0	0	0	0
Tax Benefit of Losses		0	0	0	0	0	0	0	0	0	0	0
Cash Flow	-1,000,000	0	0	0	0	0	0	0	0	0	0	1,959,810
IRR	6.96%											
SMA: Tax-Loss Harvesting (\$)												
Pre-tax Starting Balance	1,000,000	1,000,000	1,066,500	1,137,422	1,213,061	1,293,729	1,379,762	1,471,517	1,569,372	1,673,736	1,785,039	
Tax on Initial Sale of ETF	74,200											
Cost Basis	1,000,000	892,212	819,280	769,678	723,302	677,936	638,990	604,353	574,949	555,667	536,730	
Ending Balance	1,000,000	1,066,500	1,137,422	1,213,061	1,293,729	1,379,762	1,471,517	1,569,372	1,673,736	1,785,039	1,903,744	
Losses Generated		107,788	72,931	49,602	46,376	45,366	38,946	34,637	29,404	19,281	18,937	463,270
Tax Benefit of Losses		58,314	36,963	24,769	23,153	22,854	19,847	17,895	15,423	10,357	9,878	239,454
Cash Flow	-1,074,200	58,314	36,963	24,769	23,153	22,854	19,847	17,895	15,423	10,357	1,913,623	
IRR	7.85%											
Benefit of Loss Harvesting	0.89%											

*Cash-flow model does not reflect actual results or an actual investor.

Internal Rate of Return Comparison

Based on the cash flow model, the benefit of liquidating an ETF and harvesting losses declines as the cost-basis-to-market-value ratio of the ETF decreases. The IRR differences in the table below reflect a zero difference between SMA and ETF fees. If the SMA fees were 0.20% greater than the ETF fees, then the IRR differences in the table below would be 0.20% lower.*

ETF Cost Basis to Market Value	Estate/Donation (Non-Liquidation)		Liquidation	
	Tax Status**		Tax Status**	
	Federal Only	Federal + California	Federal Only	Federal + California
100%	1.5%	2.1%	0.9%	1.1%
95%	1.4%	1.8%	0.8%	1.0%
90%	1.2%	1.6%	0.8%	0.9%
85%	1.1%	1.4%	0.7%	0.8%
80%	1.0%	1.2%	0.7%	0.7%
75%	0.8%	1.0%	0.6%	0.6%
70%	0.7%	0.8%	0.5%	0.6%
65%	0.6%	0.6%	0.5%	0.5%
60%	0.4%	0.4%	0.4%	0.4%
55%	0.3%	0.2%	0.4%	0.4%
50%	0.2%	0.0%	0.3%	0.3%



Red shade: lower IRR difference

Green shade: higher IRR difference

*Note that there is a roughly one-to-one impact of fees differences and IRR differences. Please see the Appendix for tables showing additional results for various fee differences.

**As of 6/30/2019, federal-only tax rates were 40.8% on short-term and 23.8% on long-term gains; federal + California (a high-tax state) combined tax rates were 54.1% short-term and 37.1% long-term.

Analysis of Years to Break-Even Point

Based on the cash flow model, the tax cost to liquidate an ETF can also be compared to the number of years needed to achieve the same dollar amount of tax benefit from loss harvesting. The number of years needed to break even is shown in the table below.

ETF Cost Basis to Market Value	Tax Status*	
	Federal Only	Federal + California
100%	0.0	0.0
95%	0.3	0.3
90%	0.5	0.6
85%	0.8	1.0
80%	1.1	1.4
75%	1.6	1.9
70%	2.0	2.6
65%	2.7	3.4
60%	3.3	4.2
55%	4.0	5.0
50%	4.7	6.0

Notes: The number of years to break even uses nominal dollar amounts and does not reflect the time value of money. The number of years to break even is independent of the Estate/Donation (Non-Liquidation) versus Liquidation disposition. As with the comparison on the previous slide, these data reflect a zero-fee difference between the ETF and SMA.

*As of 6/30/2019, federal-only tax rates were 40.8% on short-term and 23.8% on long-term gains; federal + California (a high-tax state) combined tax rates were 54.1% short-term and 37.1% long-term.

Summary (Rules of Thumb)

- In many situations, selling an appreciated ETF and investing in an SMA with TLH may lead to a higher after-tax return.
- Depending on the fee difference between the ETF and the SMA, higher after-tax returns may be achievable when the ETF cost-basis-to-market-value ratio is greater than roughly 60%-70%.
- For investors who won't have future short-term capital gains, the cost-basis-to-market-value threshold may be substantially higher.
- State taxes can have a substantial impact on the decision variables.

Please contact Aperio for specific analysis requests.

Appendix

Additional Considerations

- **Tax-loss harvesting with ETFs**

- Although some advisors do sell ETFs when they are at a loss and then buy different ETFs, the resulting improvement in IRRs can be small versus tax-loss harvesting with individual stocks because:
 - Individual stocks are more volatile than ETFs
 - Once all of the ETFs are at a gain, there is no longer any opportunity for tax-loss harvesting unless the market turns down

- **“Unwrapping” an ETF**

- Clients have asked us whether we have heard of anyone successfully receiving in-kind securities instead of cash for ETF redemption.
- We are not aware of anyone who has done so (despite extensive investigation), and anecdotally, we believe that ETF capital market desks are unlikely to be interested in such a redemption for position sizes less than \$1 billion.

IRR Comparison for Various Fee Differences

Tax Status:* Federal Only

Based on the cash flow model, the IRR difference table below shows SMA vs. ETF fee differences** of 0.00%, 0.10%, 0.20%, and 0.30%:

ETF Cost Basis to Market Value	Estate/Donation (Non-Liquidation)				Liquidation			
	SMA Fees Minus ETF Fees				SMA Fees Minus ETF Fees			
	0.00%	0.10%	0.20%	0.30%	0.00%	0.10%	0.20%	0.30%
100%	1.5%	1.4%	1.3%	1.2%	0.9%	0.8%	0.7%	0.6%
95%	1.4%	1.3%	1.2%	1.1%	0.8%	0.7%	0.6%	0.5%
90%	1.2%	1.1%	1.0%	0.9%	0.8%	0.7%	0.6%	0.5%
85%	1.1%	1.0%	0.9%	0.8%	0.7%	0.6%	0.5%	0.4%
80%	1.0%	0.9%	0.8%	0.7%	0.7%	0.6%	0.5%	0.4%
75%	0.8%	0.7%	0.6%	0.5%	0.6%	0.5%	0.4%	0.3%
70%	0.7%	0.6%	0.5%	0.4%	0.5%	0.4%	0.3%	0.2%
65%	0.6%	0.5%	0.4%	0.3%	0.5%	0.4%	0.3%	0.2%
60%	0.4%	0.3%	0.2%	0.1%	0.4%	0.3%	0.2%	0.1%
55%	0.3%	0.2%	0.1%	0.0%	0.4%	0.3%	0.2%	0.1%
50%	0.2%	0.1%	0.0%	-0.1%	0.3%	0.2%	0.1%	0.0%

*As of 6/30/2019, federal-only tax rates were 40.8% on short-term and 23.8% on long-term gains; federal + California (a high-tax state) combined tax rates were 54.1% short-term and 37.1% long-term.

**Note that there is a roughly one-to-one impact of fees differences and IRR differences.

IRR Comparison for Various Fee Differences *(continued)*

Tax Status:* Federal + California

Based on the cash flow model, the IRR difference table below shows SMA vs. ETF fee differences** of 0.00%, 0.10%, 0.20%, and 0.30%:

ETF Cost Basis to Market Value	Estate/Donation (Non-Liquidation)				Liquidation			
	SMA Fees Minus ETF Fees				SMA Fees Minus ETF Fees			
	0.00%	0.10%	0.20%	0.30%	0.00%	0.10%	0.20%	0.30%
100%	2.1%	2.0%	1.9%	1.8%	1.1%	1.0%	0.9%	0.8%
95%	1.8%	1.7%	1.6%	1.5%	1.0%	0.9%	0.8%	0.7%
90%	1.6%	1.5%	1.4%	1.3%	0.9%	0.8%	0.7%	0.6%
85%	1.4%	1.3%	1.2%	1.1%	0.8%	0.7%	0.6%	0.5%
80%	1.2%	1.1%	1.0%	0.9%	0.7%	0.6%	0.5%	0.4%
75%	1.0%	0.9%	0.8%	0.7%	0.6%	0.5%	0.4%	0.3%
70%	0.8%	0.7%	0.6%	0.5%	0.6%	0.5%	0.4%	0.3%
65%	0.6%	0.5%	0.4%	0.3%	0.5%	0.4%	0.3%	0.2%
60%	0.4%	0.3%	0.2%	0.1%	0.4%	0.3%	0.2%	0.1%
55%	0.2%	0.1%	0.0%	-0.1%	0.4%	0.3%	0.2%	0.1%
50%	0.0%	-0.1%	-0.2%	-0.3%	0.3%	0.2%	0.1%	0.0%

*As of 6/30/2019, federal-only tax rates were 40.8% on short-term and 23.8% on long-term gains; federal + California (a high-tax state) combined tax rates were 54.1% short-term and 37.1% long-term.

**Note that there is a roughly one-to-one impact of fees differences and IRR differences.

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Back-testing involves simulation of a quantitative investment model by applying all rules, thresholds, and strategies to a hypothetical portfolio during a specific market period and measuring the changes in value of the hypothetical portfolio based on the actual market prices of portfolio securities. Investors should be aware of the following: 1) Back-tested performance does not represent actual trading in an account and should not be interpreted as such, 2) back-tested performance does not reflect the impact that material economic and market factors might have had on the manager's decision-making process if the manager were actually managing clients' assets, and 3) there is no indication that the back-tested performance would have been achieved by a manager had the program been activated during the periods presented. For back-tested performance comparisons, the benchmark returns are simulated using historical constituents' weights and total returns.

ETF Comparisons: The value added shown reflects comparison of the hypothetical internal rate of return for an ETF with no tax consequences other than from delisting versus the internal rate of return for a tax-loss harvesting separately managed account. Liquidation comparison assumes both hypothetical investments are sold at the end of 10 years and that taxes due are paid. Non-liquidation comparison assumes that both investments are passed through to an estate or donated to charity and receive a step up in cost basis, thus owing no tax at the end of the 10-year period. Ten-year annualized excess return refers to the difference between the after-tax return of the tax-loss harvesting SMA versus the ETF benchmarked to the same index.

Monte Carlo simulations shown reflect randomly generated outcomes based on historical statistical parameters as disclosed on the slides. Such simulations show probability of different outcomes rather than predicting a particular outcome. Results may be worse than shown in simulations.