Dimensional

Addressing Concentrated Stock Positions in Client Portfolios

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A concentrated position in a portfolio is often an outcome of success. Investors might have gotten equity grants from their employers. Their business or investment might have had a successful initial public offering (IPO). Or perhaps they bought a stock that subsequently had strong performance. Now the question is, how do they preserve and grow their wealth over time? Keeping the concentrated position could expose their wealth to significant stock-specific risk. However, if they have a low cost basis for the stock, diversifying could come with a large tax bill.

One solution to this problem is to use an exchange fund—an investment vehicle that allows investors to exchange their concentrated stock positions for shares of a diversified portfolio without realizing capital gains taxes. The diversified portfolio includes stocks contributed by all investors to the fund.

In this article, we first discuss how an exchange fund works and then compare it with two alternative approaches: (1) keeping the concentrated position and (2) selling the concentrated position and buying a broad market exchange-traded fund (ETF).

What Is an Exchange Fund?

An exchange fund is a type of private fund, generally structured as a limited partnership, that allows qualified investors to contribute their concentrated stock positions in exchange for units of the fund. Investors in an exchange fund are typically required to remain invested in the fund for at least seven years to meet the tax deferral requirements.[1] After seven years, investors can redeem their units and receive a basket of stocks from the fund, keeping the original cost basis of their contribution. An exchange fund, thus, offers participants the opportunity to get broadly diversified equity exposure and defer capital gains realization on their appreciated stock positions.

Comparing Exchange Funds with Alternative Approaches

One of the most powerful tools in risk management is portfolio diversification. Because equity returns are not perfectly correlated, diversification across stocks generally results in lower volatility. Put differently, if you have a concentrated stock position, you could be exposed to higher volatility and greater uncertainty around long-term investment outcomes.

An obvious approach to gaining diversified exposure is to sell the concentrated position and buy a broadly diversified, low-cost ETF. Upon this transaction, the diversified exposure can be maintained at a relatively low fee and with plenty of liquidity. However, if the concentrated stock position is highly appreciated, that approach may incur large capital gains taxes at the time of selling the concentrated position. Alternatively, investors can opt for an exchange fund without selling the concentrated position. This way, they can also obtain immediate diversification but do not have to pay capital gains taxes right away.

In the Appendix, we provide an analytical framework to compare the two approaches. This framework shows that tax deferral can indeed benefit investors by eliminating double taxation on the gain on the taxable portion of the initial assets. However, if the diversified portfolio ends up losing value over the investment horizon, the exchange fund approach might lead to lower after-tax post-liquidation wealth for the investor. Also, an exchange fund tends to charge a higher fee than a market ETF, as there are additional costs related to the tax requirements for an exchange fund structure. This fee differential can also reduce the benefit of the exchange fund approach.

1. The Internal Revenue Service sets forth a number of requirements that an exchange fund has to meet. For example, at least 20% of the portfolio must be invested in "qualifying assets" that are not marketable securities, e.g., private real estate properties.

So which approach is most beneficial for investors? In what follows, we consider the following three scenarios:

(1) leave the concentrated position as is;

(2) sell the concentrated position and buy a broad market ETF; or

(3) use an exchange fund.[2]

To examine the growth of wealth under these three scenarios, we make several key assumptions.

- The initial wealth is $1 million held in a single stock with a $200,000 cost basis.
- The growth of wealth is log-normally distributed.[3]
- The expected annual returns of portfolios and single stocks are 10%.
- The expected annual volatility of portfolios is 20%.
- The expected annual volatility of single stocks is either 30% or 50% (Scenario 1 with Lower and Higher Volatility, respectively).[4]
- The current and future capital gains tax rates are 23.8%.[5]
- The management fee for Scenario 2 is 4 basis points (bps).[6]
- The management fee for Scenario 3 is 60 bps.
- The exchange fund and the ETF make no taxable distributions over the investment horizon.[7]
- Investors have enough external capital gains to fully use any losses realized under each approach.[8]

2. For simplicity, we assume that the choice of which scenario an investor follows is locked in at time zero. In reality, the investor can choose to switch from Scenario 1 to 2 at any time; for example, when the concentrated position has dropped in value and worsened the tradeoff between tax deferral and diversification. The investor might also be able to switch from Scenario 1 to 3 later if exchange funds have capacity for that stock. This multiperiod and complex optionality, however, would make the analytical problem intractable. By abstracting from this optionality, we can provide a practical framework for evaluating the tradeoffs across different scenarios. We also show in **Exhibit 3** how the tradeoff between the three scenarios changes as the ratio of unrealized capital gains to acquisition cost changes. In addition, we omit the possibility of an investor passing away within the seven-year period. In such an event, the heir can typically redeem the units of an exchange fund without any penalties and get step up in basis. Thus, the exclusion of this possibility makes the estimated benefit of an exchange fund more conservative.
3. A log-normal distribution is a probability distribution of a random variable the logarithm of which is normally distributed.
4. During the period January 1991–September 2023, the weighted-average and simple-average 60-month volatility in the US market were approximately 30% and 50%, respectively.
5. As of January 2024, 20% is the highest federal tax rate for long-term capital gains, and we add 3.8% investment tax for households with an income above $250,000. Capital gains tax rates might change in the future. Examining the impact of uncertainty in tax rates on investment outcomes is beyond the scope of this study.
6. The fee of 4 bps is based on the average management fee of the 10 largest US broad market ETFs. The sample includes ETFs that do not target the broad market and those that do not value-weight stocks are excluded from the sample.
7. This assumption may not hold in a live exchange fund or ETF, which may have taxable capital gains distributions from time to time.
8. This assumption generally benefits Scenario 1 more than 3 because the high volatility of Scenario 1 would incur a greater loss than Scenario 3 for a given percentile outcome. It also generally benefits Scenario 2 more than 3 because Scenario 2 sets a higher cost basis at the beginning, which allows investors to claim a greater loss, while the cost basis for Scenario 3 stays the same.

Exhibit 1 shows the wealth at the 25th, 50th, and 75th percentiles of the distribution of potential outcomes at the end of seven years, suggesting that using an exchange fund generally results in higher ending wealth. After seven years, the 25th and 50th percentile outcomes of Scenario 3 (exchange fund) meaningfully exceed those of Scenario 1 (concentrated position) regardless of the volatility assumption for the single stock. The median post-liquidation values are $1.20 million, $0.8 million, $1.26 million, and $1.3 million for Scenario 1 with lower volatility, Scenario 1 with higher volatility, Scenario 2, and Scenario 3, respectively. The 75th percentile outcome of Scenario 1 with lower single stock volatility outpaces Scenario 3 over this horizon, because the higher volatility of the concentrated position creates a wider distribution of outcomes, making the 75th percentile outcome more favorable. However, higher volatility also slows down the growth of wealth.[9] Therefore, there is an inflection point where higher volatility starts eroding the growth of wealth even at a favorable point in the distribution, such as at the 75th percentile, putting Scenario 1 with higher single stock volatility behind Scenario 3.

We now compare Scenario 3 (exchange fund) and Scenario 2 (ETF). Across all three percentiles, Scenario 3 outpaces Scenario 2 in both pre- and post-liquidation, even though we assume a higher management fee for Scenario 3.

EXHIBIT 1: Growth of $1 Million over Seven Years

	SCENARIO 1		SCENARIO 2	SCENARIO 3
	Single Stock with Lower Volatility	Single Stock with Higher Volatility	ETF	Exchange Fund
Initial Portfolio Value	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Cost Basis	$200,000	$200,000	$200,000	$200,000
Tax Rate	23.80%	23.80%	23.80%	23.80%
Management Fee	0	0	4 bps	60 bps
Expected Return	10%	10%	10%	10%
Expected Volatility	30%	50%	20%	20%
	25th percentile			
Ending Wealth after 7 Years, Pre-Liquidation	$939,958	$466,004	$1,017,712	$1,209,564
Ending Wealth after 7 Years, Post-Liquidation	$763,848	$402,695	$968,181	$969,288
	50th percentile			
Ending Wealth after 7 Years, Pre-Liquidation	$1,515,988	$1,009,863	$1,404,242	$1,671,668
Ending Wealth after 7 Years, Post-Liquidation	$1,202,783	$817,116	$1,262,717	$1,321,411
	75th percentile			
Ending Wealth after 7 Years, Pre-Liquidation	$2,445,025	$2,188,445	$1,937,578	$2,310,316
Ending Wealth after 7 Years, Post-Liquidation	$1,910,709	$1,715,195	$1,669,119	$1,808,061

Simulated strategy returns are based on model/backtested performance. The performance was achieved with the retroactive application of a model designed with the benefit of hindsight; it does not represent actual investment performance. Backtested model performance is hypothetical (it does not reflect trading in actual accounts) and is provided for informational purposes only. The securities in the model may differ significantly from those in client accounts. Model performance may not reflect the impact that economic and market factors might have had on the advisor's decision-making if the advisor had been actually managing client money.

*The simulated performance is "net performance," which includes the reinvestment of dividends and other earnings and reflects the deduction of an investment advisory fee of **4 basis points** for each year for the hypothetical diversified ETF portfolio and an investment advisory fee of **60 basis points** each year for the hypothetical exchange fund. No trading costs are subtracted. A client's investment returns will be reduced by other expenses that may be incurred in the management of the advisory account. **Past performance, including simulated performance, is no guarantee of future results, and there is always the risk that a client may lose money.***

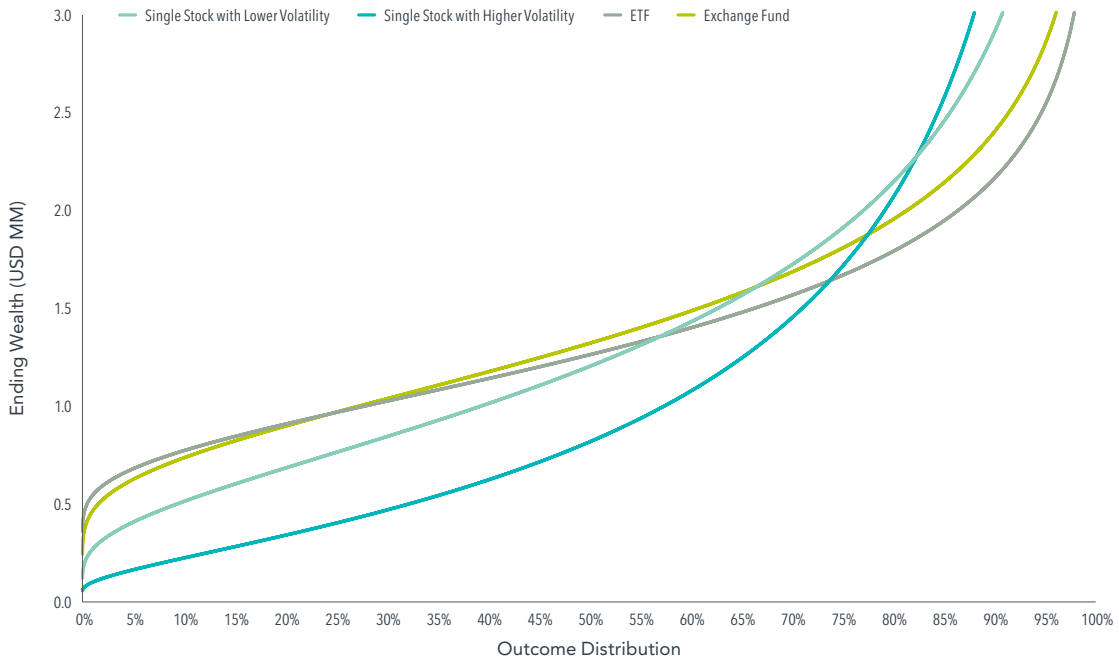
Please see "Methodology" for details. The initial portfolio value and cost basis are evaluated before any transactions, i.e., the value of investors' concentrated position. For example, for Scenario 2, it is the value before selling the concentrated position and buying an ETF.

9. The mean of the wealth process is reduced by the volatility of the return as shown in Equation 2 in the Appendix.

To illustrate a broader spectrum of outcomes, **Exhibit 2** shows the post-liquidation wealth after seven years across the probability distribution. We again observe the benefits of diversifying a concentrated position and the advantages an exchange fund provides to do so. Most of the time, the after-tax wealth for investors under Scenarios 2 (ETF) and 3 (exchange fund) exceeds that for Scenario 1 (concentrated position). The exchange fund's seven-year, after-tax value exceeds that of the concentrated position, with lower and higher volatility for 68% and 78% of the distribution, respectively, while the value of the ETF exceeds that of the concentrated position with lower and higher volatility for 57% and 74% of the distribution, respectively. This, of course, is not cost-free, as the investor must give up liquidity during the seven years and forfeits the lottery-like upside of the concentrated position. For sufficiently positive outcomes, the investor gives up large ex post payoffs.[10]

On the other end of the spectrum, where the market returns are low, Scenario 2 (ETF) outperforms Scenario 3 (exchange fund). This happens for the worst 24% of outcomes. The sale of the concentrated position sets a higher cost basis, allowing investors under the ETF scenario to claim a greater capital loss when the market performs poorly. This, along with its lower assumed fee, results in higher after-tax post-liquidation wealth for the ETF scenario than for the exchange fund scenario in poor market environments.

EXHIBIT 2: Distribution of Post-Liquidation Ending Wealth after Seven Years



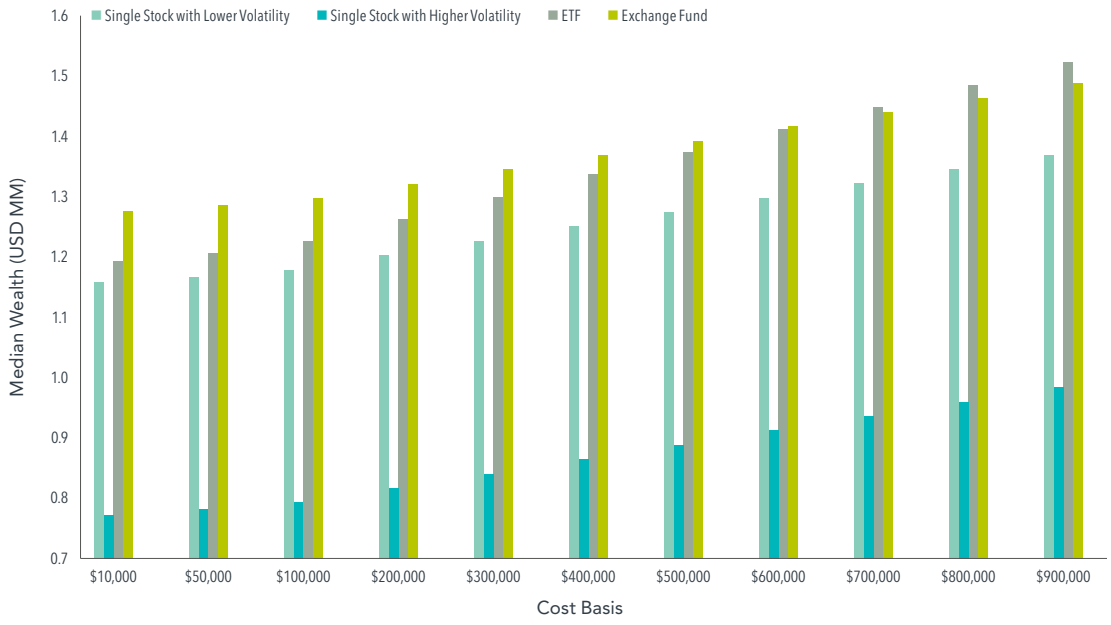
Past performance, including simulated performance, is no guarantee of future results, and there is always the risk that a client may lose money. *The initial wealth is $1 million. Please see "Methodology" for details.*

10. A lottery-like upside of a stock's performance is a very large stock return that is very unlikely to happen.

Sensitivity to Cost Basis

So far, we have assumed that the investor cost basis is 20% of the portfolio value. How would the potential benefit of an exchange fund change with the cost basis? The analytical framework in the Appendix shows that tax deferral can benefit investors by avoiding double taxation on the gain on the taxable portion of the initial assets. This suggests that the larger the taxable portion of the initial assets, i.e., the lower the initial cost basis, the larger the potential benefit from the tax deferral via the exchange fund approach, all else equal. To quantify that effect, **Exhibit 3** summarizes the median after-tax post-liquidation wealth across various cost bases. Using an exchange fund results in a bigger benefit with a lower cost basis, while still coming out ahead of alternative scenarios at a cost basis as high as 70% ($700,000 in our example). Only when the cost basis is close to the initial value (e.g., 80%) does the ETF scenario outperform the exchange fund scenario, because the benefit of its lower fee outweighs the tax deferral benefit of the exchange fund.

EXHIBIT 3: Median Growth of $1 Million Using Various Cost Bases



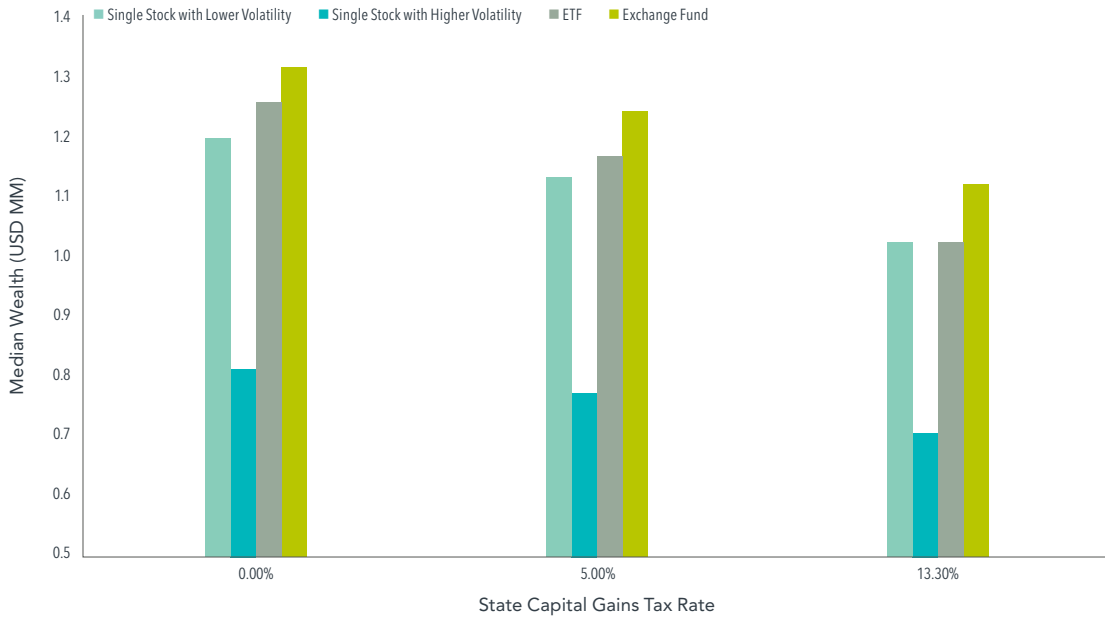
Past performance, including simulated performance, is no guarantee of future results, and there is always the risk that a client may lose money. *Please see "Methodology" for details.*

Sensitivity to Tax Rates

The relative performance across different scenarios also depends on the tax rate. State capital gains tax rates range from zero for certain states such as Nevada and Texas to 13.3% in California.[11] **Exhibit 4** shows the median wealth across different tax rates. The outperformance of the ETF scenario over the concentrated position (Scenario 2 over 1) diminishes with increasing tax rates. Scenario 2 compounds wealth more quickly than Scenario 1 due to its lower volatility, but the initial tax payment decreases the wealth available to compound. On the other hand, Scenario 1 enjoys compounding on initially greater wealth while subsequently growing it slower due to higher volatility. As the tax rate increases, the initial tax payment increases, while the difference in the growth rate of wealth due to the volatility difference is unaffected. This puts the exchange fund scenario (Scenario 3) ahead of both since it has the same initial wealth as Scenario 1 and the same volatility as Scenario 2.

Furthermore, the outperformance of the exchange fund over the ETF scenario is greater with a higher tax rate because the benefit of the tax deferral increases with the tax rate. The after-tax post-liquidation wealth after seven years is about $100,000 greater with an exchange fund than with an ETF in California with its additional 13.3% for the state capital gains tax. This outperformance is about $40,000 greater than in a state with zero state capital gains tax.

EXHIBIT 4: Median Growth of $1 Million Using Various Levels of State Capital Gains Taxes



Past performance, including simulated performance, is no guarantee of future results, and there is always the risk that a client may lose money.
Please see "Methodology" for details. 13.3% is the highest state tax rate for capital gains. 5% is the average across each state's highest capital gains tax rate.

11. Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, and Wyoming impose no state capital gains tax. Source: Timothy Vermeer, "*State Individual Income Tax Rates and Brackets, 2023*," Tax Foundation, February 21, 2023.

Conclusion

Finding a tax-efficient way to preserve and grow wealth is top of mind for many investors. By deferring the realization of the capital gains tax and providing diversification, an exchange fund can lead to better long-term outcomes for investors. Our analysis suggests that the benefits of an exchange fund approach are likely to be larger for investors with a lower cost basis and higher federal and state capital gains tax rates. The benefits of an exchange fund highlighted in this article need to be weighed against its potential costs, including liquidity constraints that exchange funds can impose on investors. However, if investors are not liquidity constrained, an exchange fund may help them accumulate more wealth by providing a tax-efficient transition away from their concentrated position toward a broad diversified portfolio.

Appendix

Methodology

We assume that continuously compounded returns are normally distributed, and hence the growth of wealth of an investment, X, is log-normally distributed.

$$\ln\frac{X_t}{X_0} = \mu(t - t_0) + \sigma\sqrt{t - t_0}N(0,1)\,, \tag{1}$$

where the mean and standard deviation of this wealth process, μ and σ, respectively, are computed based on the mean of the simple returns of an investment, E(r), and its standard deviation, σ(r), as follows:

$$\mu = \ln\big(1 + E(r)\big) - \frac{1}{2}\ln\left(1 + \left(\frac{\sigma(r)}{1+E(r)}\right)^2\right) \tag{2}$$

$$\sigma = \sqrt{\ln\left(1 + \left(\frac{\sigma(r)}{1+E(r)}\right)^2\right)}. \tag{3}$$

Based on this assumed distribution, we analytically compute the wealth under each scenario.

Tax Deferral and Asset Allocation Decision

Using an exchange fund defers the realization of a capital gain and associated tax payment until later. One may argue that this is equivalent to leveraging up by borrowing interest-free money from the government, and hence it exposes investors to greater risk. We provide an alternative interpretation.

The liquidation value of an investment (V) is determined by the investment horizon (T), investment return between time 0 and T (r), initial cost basis (B), and tax rate (τ). Assuming initial wealth of 1, we express the liquidation value in the case of tax deferral, as with an

exchange fund, in terms of the pre-tax asset value at time T (first term) minus the tax paid at time T (second term):

$$V_T^{TD} = (1+r) - \tau_T\big((1+r) - B\big). \tag{4}$$

We rearrange this to express in terms of the sum of the initial liquidation value (first term), post-tax gain on the initial cost basis (second term), and gain on the initial capital gain taxed at the end (third term):

$$V_T^{TD} = (1 - \tau_T + \tau_T B) + (1-\tau_T)rB + (1-\tau_T)r(1-B). \tag{5}$$

Similarly, the liquidation value in the case of no tax deferral, as with the liquidation/ETF scenario, is expressed in terms of the initial liquidation value (first term) and the post-tax gain at time T (second term):

$$V_T^{NTD} = (1 - \tau_0 + \tau_0 B) + (1-\tau_T)r(1 - \tau_0 + \tau_0 B). \tag{6}$$

The second term can be further decomposed as follows into the post-tax gain on the initial cost basis and the gain on the initial capital gain, taxed at the beginning and at the end.

$$V_T^{NTD} = (1 - \tau_0 + \tau_0 B) + (1-\tau_T)rB + (1-\tau_T)(1-\tau_0)r(1-B). \tag{7}$$

If the tax rate stays the same between time 0 and T, the second term of Equation 7 can be written as the gain on the initial capital gain, taxed twice.

$$V_T^{NTD} = (1 - \tau + \tau B) + (1-\tau)rB + (1-\tau)^2 r(1-B). \tag{8}$$

Subtracting Equation 7 from Equation 5, the difference between with and without tax deferral is given by:

$$\begin{aligned} V_T^{TD} - V_T^{NTD} &= (1 - \tau_T + \tau_T B) - (1 - \tau_0 + \tau_0 B) + (1-\tau_T)r(1-B) - (1-\tau_T)(1-\tau_0)r(1-B) \\ &= (1 - \tau_T + \tau_T B) - (1 - \tau_0 + \tau_0 B) + \tau_0(1-\tau_T)r(1-B). \end{aligned} \tag{9}$$

If the tax rate stays the same between time 0 and T, this simplifies to:

$$V_T^{TD} - V_T^{NTD} = \tau(1-\tau)r(1-B). \tag{10}$$

Thus, the difference between with and without tax deferral is the tax on the post-tax return on the initial capital gain. In other words, tax deferral can benefit investors by avoiding double taxation on the gain on the taxable portion of the initial assets.

This framework also shows that tax deferral can hurt investors if their portfolio loses value. For example, they might still have to pay tax on the deferred initial gain, whereas under the concentrated stock liquidation scenario, they would have reset their tax basis and would have a tax loss to claim.

Further, the above analysis assumes the same fee with and without tax deferral for simplicity. In reality, an exchange fund tends to charge a higher fee than a market ETF, i.e., the investment return, r, is different with and without tax deferral by the fee differential, δ. Thus, Equations 5 and 7 are rewritten as:

$$V_T^{TD} = (1-\tau+\tau B) + (1-\tau)r_{TD}B + (1-\tau)r_{TD}(1-B).$$

$$V_T^{NTD} = (1-\tau+\tau B) + (1-\tau)rB + (1-\tau)^2 r(1-B), \quad (11)$$

where $r_{TD} = r - \delta$. Therefore, the difference in investment value with and without tax deferral is also rewritten as:

$$\begin{aligned} V_T^{TD} - V_T^{NTD} &= (1-\tau)(r_{TD} - (1-\tau+B\tau)r) \\ &= \tau(1-\tau)r(1-B) + (1-\tau)(r_{TD} - r) \\ &= \tau(1-\tau)r(1-B) - (1-\tau)\delta. \end{aligned} \quad (12)$$

The first term in Equation 12 is the same as that in Equation 10. Therefore, the fee differential, δ, reduces the benefit of tax deferral by the amount $(1-\tau)\delta$.